

## SIXTH- AND SEVENTH-CENTURY ELEPHANT IVORY FINDS FROM THE CARPATHIAN BASIN

### The Sources, Circulation and Value of Ivory in Late Antiquity and the Early Middle Ages

ÁDÁM BOLLÓK\* – ISTVÁN KONCZ\*\*

*Jelen tanulmány célja az elefántcsont mint nyersanyag lehetséges forrásaira és értékére vonatkozó, a római és a késő ókori mediterrán világból származó adatok áttekintése, információkat nyerve ezáltal a 6–7. századi Kárpát-medence régészeti hagyatékából előkerült elefántcsonttárgyak eredetére, elérhetőségére és árára vonatkozólag. A hellenisztikus kortól a kora középkorig terjedő időszakban a Földközi-tenger vidéki elefántcsont-kereskedelem dinamikáját megvilágító írott és tárgyi források áttekintése nyomán úgy tűnik, hogy a 6–7. századi Közép-Duna-vidéki elefántcsonttárgyak nyersanyaga a Földközi-tenger medencéjén keresztül Afrikából, ezen belül is talán a kontinens keleti feléről érkezett. Megállapítható emellett, hogy a mediterrán világ keleti és középső régióiban készült, a Kárpát-medencébe elkerült elefántcsonttárgyak nem tekinthetők kiemelkedően drága luxusjavaknak, többségük viszonylag szerény áron megvásárolható volt.*

*Kulcsszavak: elefántcsont, távolsági kereskedelem, reprezentáció, vörös-tengeri kereskedelem, római indiai-óceáni kereskedelem, késő ókor, Kárpát-medence, langobárd kor, avar kor*

*The present paper seeks to examine the available data on the possible sources and monetary value of elephant ivory, both as raw material and finished products, in the Roman to late antique Mediterranean world in order to gain a better understanding of the wider context of elephant ivory artefacts dating from the sixth and seventh centuries discovered in the Carpathian Basin. After reviewing the written and material evidence on the dynamics of the Mediterranean elephant ivory trade from the Hellenistic period until the Early Middle Ages, our main conclusion is that the raw material of the sixth- to seventh-century ivory objects of the Middle Danube Region in all probability originated from Africa, possibly from the continent's eastern parts, and arrived to this area through the Mediterranean. It is further argued that the few artefacts manufactured of elephant ivory in the eastern and central regions of the Mediterranean that reached the Carpathian Basin cannot be regarded as extremely expensive luxury goods – in fact, their majority would have been quite affordable to customers of more modest means.*

*Keywords: elephant ivory, long-distance trade, social display, Red Sea trade, Roman Indian Ocean trade, Late Antiquity, Carpathian Basin, Langobard period, Avar period*

## 1. Introduction

In a previous study, currently awaiting publication, we covered the chronology and geographic distribution as well as the cultural connections of the sixth–seventh-century ivories from the Carpathian Basin,<sup>1</sup> and sought to find an explanation for why the currently known pieces show a concentration in the middle third of the sixth

\* Ádám Bollók: ELKH – Research Centre for the Humanities – Archaeological Institute; 1097 Budapest, Tóth Kálmán u. 4.; e-mail: bollokadam@yahoo.de

\*\* István Koncz: ELTE – Eötvös Loránd University, Institute of Archaeological Sciences; 1088 Budapest, Múzeum körút 4/B; e-mail: fredgar22@gmail.com

<sup>1</sup> For the sake of simplicity, throughout this paper “ivory” will denote “elephant ivory”. For the different sorts of ivories, see the brief introductory discussion in KONCZ–BOLLÓK in press. Unless otherwise indicated, all dates are AD.

☞ Manuscript accepted: April 23, 2020. Manuscript received: June 27, 2020.

century and in the western half of the Carpathian Basin, then under Langobard rule, while ivory objects are virtually absent from Gepidic- and Avar-period burials, even though both the historical sources and the archaeological record clearly attest to the quite intense Mediterranean contacts of these two peoples.<sup>2</sup> This scarcity is particularly striking in the case of the Avars, given that the textual and material record leaves no doubt that the military campaigns against Byzantium, the diplomatic relations, and the “shopping sprees”<sup>3</sup> to the Roman lands would have provided ample opportunity for acquiring a wide range of Byzantine goods, ivory carvings among them. As part of our inquiry, we sought to explore several potential explanations in detail, among others that (1) ivory was a highly prized commodity and was therefore extremely expensive, and (2) the fact that raw ivory and various objects carved from it became virtually unavailable at the time the Avars arrived to and settled in the Carpathian Basin, meaning that ivory carvings either did not reach this region or no more than a few pieces did. We first examined the potential sources of ivory during the centuries of Late Antiquity, as well as at what price and for how long ivory was available to the population of the Eastern Roman Empire and Italy, the most probable source of the ivory articles known from the Carpathian Basin. Our ultimate conclusion was that the low number of ivories from the early medieval Carpathian Basin can be attributed to cultural preferences rather than to the price of this raw material or its availability. Knowing that ivory as a raw material was less suited to recycling and to wealth accumulation than precious metals, and that a part of the ivory carvings produced in the Mediterranean world – such as the well-known diptychs – could not be readily incorporated into the material culture of Barbarian societies, the late antique and early medieval ivories were generally not particularly prized commodities in Barbarian societies.<sup>4</sup>

The evidence presented here about the ivory trade and the prices of the late antique and early medieval Mediterranean world is useful not only because it virtually precludes the possibility that the Avar-period population or the population of the Langobardic and Gepidic polities of the Carpathian Basin would have had no access to larger amounts of ivories simply for chronological reasons. The data presented in the following also allow a rough assessment of the value of the

ivory carvings reaching the Carpathian Basin that have been preserved in the sixth–seventh-century material record as well as the sourcing of their raw material, albeit the latter with certain constraints. The former is instructive because it is still one of the commonplaces of East-Central European archaeological studies that ivory was a scarce and expensive luxury item available to, and affordable for, few in Late Antiquity and the early Middle Ages. Even though Anthony Cutler strove to dispel this widely-held premise already in the 1980s, citing the evidence that contrary to all expectations, the price of ivory in the fourth–sixth centuries was surprisingly low,<sup>5</sup> his arguments made little inroad into, and had but limited impact on, early medieval archaeological studies in Central Europe.<sup>6</sup> The available evidence has increased during the past three decades and has fully confirmed Cutler’s assertions. Earlier assumptions about the changes in the price and value of ivory, on its origins and sources as well as on the dynamics of its trade can now be enriched with new data and insights, in part owing to the growth of the material record and in part to the increasing prominence of archaeometric analyses. It seems to us that in the light of the evidence presented here, both the value of the ivories known from the sixth–seventh-century archaeological record of the Carpathian Basin and the sources of the objects’ raw material can be determined with a fair degree of confidence.

## 2. The sources and price of ivory in the Roman-period and late antique Mediterranean

While the first truly exotic creatures which on the testimony of the written sources were displayed in the *Circus maximus* of Rome were the war elephants captured from Pyrrhus, ruler of Epirus, in 275 BC,<sup>7</sup> these enormous beasts remained a curiosity in the eyes of the *Urbs*’ population, despite their more or less regular appearance throughout the Republican and Imperial period. Their size, their capture, and the costs of their transportation,<sup>8</sup> as well as the many diffi-

<sup>2</sup> KONCZ–BOLLÓK in press.

<sup>3</sup> Cf. BOLLÓK 2019.

<sup>4</sup> KONCZ–BOLLÓK in press.

<sup>5</sup> CUTLER 1985a; CUTLER 1987.

<sup>6</sup> One welcome exception is Jörg Drauschke’s study on the Merovingian ivories from southern Germany, in which he discusses their value based on Cutler’s writings: DRAUSCHKE 2011b, 123–124.

<sup>7</sup> JENNISON 1937, 44.

<sup>8</sup> For the organisation of how these animals were supplied, cf. MACKINNON 2006.

culties in taming and breeding them in captivity all bolstered the perception in the Roman world that they were creatures solely befitting rulers.<sup>9</sup> However, this was not the case regarding their tusks, designated as elephant ivory.<sup>10</sup> Access to raw ivory within the confines of the Roman Empire – which first incorporated north-western Africa, then the greater part of the Mediterranean Basin and finally its entirety – was ensured for the greater portion of the wealthier population by the first century AD. The symbolic start of this process can be pinpointed to Lucius Cornelius Scipio's triumphal procession after his victory over the army of the Seleucid ruler Antiochus III (r. 222–187 BC) at Magnesia ad Sipylum in Lydia in 190 BC, when the people of the *Urbs* could marvel at the enormous amounts of precious metal objects and coins – obviously taken from the vanquished king's treasury<sup>11</sup> – alongside the 1231 elephant tusks.<sup>12</sup> The symbolic end point is illustrated by the bracelets, hairpins, and dress pins that reached the empire's more distant Western and Central European provinces, a reflection of how raw material resources became accessible even to simpler folks which did not enjoy a particularly wealthy status by the Roman Imperial period.

This situation – even if not self-evidently and not in each and every region – persisted until the existence of the largely unified empire, up to the close of the fourth century. One might rightly claim that this changed from the early decades of the fifth century, after Roman administration gradually ceased in the former Central and Western European provinces amidst the turmoils of the Migration period. In the wake of the Vandals' conquest of North Africa, the Empire was no longer able to directly control the routes leading through north-western Africa. We would quite naturally expect that access to elephants and elephant ivory would have significantly declined or even ceased altogether. Yet, the material record belies this assumption. In order to understand why the disintegration of the uniform political and economic framework provided by the late Roman state did not usher in a decisive change in the late antique ivory trade, we must begin further afield.

## 2.1. *The route of raw ivory to the Hellenistic and Roman Mediterranean markets*

### 2.1.1. North-eastern Africa and western India

On the testimony of the surviving written sources, the Romans first encountered elephants in Italy in the third century BC when they clashed with the Epiran army.<sup>13</sup> While it seems likely that the creatures in questions had been war elephants from India,<sup>14</sup> a precise species identification is near-impossible because the written sources tend to resort to a widespread literary topos when contrasting Indian and African elephants,<sup>15</sup> without really bothering to make genuine distinctions between different – and some by now already extinct – species.

A new phase in the military use of elephants was opened when, in order to replenish the dwindling numbers of Indian war elephants reaching Egypt as part of booty in the time of Ptolemy I Soter (r. 305–282 BC),<sup>16</sup> both Ptolemy II Philadelphus (r. 285–282–246 BC) and his immediate successors spared no effort to organise hunting expeditions to Ethiopia and to put the captured elephants to military use.<sup>17</sup> The latter aspirations, as shown most acutely by the Battle of Raphia in 217 BC, had but limited success.<sup>18</sup> With the passing of the time, elephants gradually disappeared from the battlefields of the Hellenistic world,<sup>19</sup> even though their military use did not cease altogether.<sup>20</sup>

The Ptolemies' desire for elephants had two far-reaching consequences. Firstly, several settlements such as Berenike and Ptolemais Theron (modern 'Aqiq in Sudan) (Fig. 1) were founded

<sup>9</sup> JENNISON 1937, 93; BOMGARDNER 2001, 103, cf. also OPELT 1959, 1016–1019; TOYNBEE 1973, 39–46, 53.

<sup>10</sup> For the terminology, cf. KONCZ–BOLLÓK in press.

<sup>11</sup> Cf. CUTLER 1987, 433.

<sup>12</sup> "...eburneos dentes mille ducentos triginta unum...": Titus Livius, *Ab Urbe condita* XXXIX.59.3, Latin text and English translation: SAGE 1984, 474–475.

<sup>13</sup> TOYNBEE 1973, 33–34.

<sup>14</sup> While a few genuine Syrian elephants – now extinct, westernmost occurrence of Asian elephants – undoubtedly still roamed the Near East and Iran in the third–second centuries BC, the Hellenistic and Roman sources tend to agree that the region's Hellenistic rulers obtained their war elephants from India. Cf. Strabo, *Geographica* XV.2.9(724) (Greek text and English translation: JONES 1930, 142–143; Hungarian translation: FÖLDY 1977, 751), Polybius, *Historiae* XI.39.11–12 (Greek text and English translation: PATON 1925, 302–303).

<sup>15</sup> BIGWOOD 2007; BANNIKOV–POPOV 2014.

<sup>16</sup> JENNISON 1937, 30–31; TOYNBEE 1973, 39, 347, note 4; CASSON 1993, 247–248; COBB 2016, 192.

<sup>17</sup> JENNISON 1937, 37–39; CASSON 1993; BURSTEIN 1996, 800–801, BOWERSOCK 2013, 37; COBB 2016.

<sup>18</sup> Cf. JENNISON 1937, 37–40. Some of his conclusions, such as his explanation of the size of the elephants in the Egyptian army (cf. CASSON 1989, 108; CASSON 1993, 248; COBB 2016, 198, note 31; BRANDT et al. 2014) are no longer tenable. COBB 2016, 197–200, 203–204.

<sup>19</sup> BUGH 2013, 277–279, with a brief survey of the military uses of elephants in the Hellenistic period; COBB 2016, 198–200.

<sup>20</sup> OPELT 1959, 1003–1004, 1009–1010; TOYNBEE 1973, 37–38; RANCE 2003.



Fig. 1. The main markets of elephant ivory in ancient and late antique Red Sea and Indian Ocean trade (map: Zsolt Réti)

1. kép. A vörös-tengeri és az indiai óceáni ókori és késő ókori elefántcsont-kereskedelem főbb állomásai (térkép: Réti Zsolt, BTK RI)

with a view to creating the infrastructure necessary for the regular hunting expeditions organised to the regions south of Egypt for capturing elephants, which in later centuries became important stations of the ivory trade as well as of the trade routes leading towards India.<sup>21</sup> Secondly, it would appear that the growing demand for elephants and ivory under the Ptolemies led to a significant over-hunting. The first expeditions, mainly in Ptolemy II's time, predominantly targeted the northern coast of the Red Sea lying closer to Egypt; under the reigns of his son and his grandson, these expeditions ventured as far as the northern Somali coast (to the tip of the Horn of Africa).<sup>22</sup> In less than two to three decades, this process led to a significant depletion of the region's elephant population.<sup>23</sup> At the

same time, the creation of the networks for capturing these animals brought a significant expansion in potential access to raw ivory.

Initially, the expeditions organised by the Egyptian rulers for procuring elephants and ivory led to a growth in the amount of tusks available on the market, leading to a decrease in their price: by the mid-third century BC, the price of tusk dropped to about 1/15th of what it had been a century earlier.<sup>24</sup> The trade route leading north along the Nile from the heartland of Africa, the diplomatic relations with the southern peoples, and Egyptian hunting expeditions all played a prominent role among the sources of elephant tusks.<sup>25</sup> One indication of the immense amounts of ivory reaching the north is Ptolemy II's spectacular procession held in Alexandria after his Nubian campaign of 275 BC in which, in addition to the exotic beasts, the Ethiopian "gift-bearers" bore six hundred tusks in the pro-

<sup>21</sup> JENNISON 1937, 37; CASSON 1993, 248–249; DAVIES 2013, 84–85; COBB 2016, 195–196. For the network of the Roman-period ports of the Red Sea trade, cf. SIDEBOTHAM 2017.

<sup>22</sup> CASSON 1993, 249, note 6 (for the expeditions to the continent's interior), 255–256; BOWERSOCK 2013, 34–39; COBB 2016, 195.

<sup>23</sup> CASSON 1993, 256; BURSTEIN 1996; TÖRÖK 2009, 385; COBB 2016, 201–204.

<sup>24</sup> TARN 1928, 258; CUTLER 1987, 432; cf. also BURSTEIN 1996, 803; COBB 2016, 202.

<sup>25</sup> BURSTEIN 1996, 804–806.

cession.<sup>26</sup> Simultaneously with the depletion of the African sources, Indian ones gradually came to play an increasingly prominent role. It is difficult to pinpoint an exact date – and in any case, ivory does not figure prominently in the written sources with their laconic reports on the Indian trade during the Ptolemaic period.

Not so the texts revealing details of the ivory trade in the earlier Roman Imperial period. One of the most important among these, the *Periplus Maris Erythraei*, written between 40 and 70 by an Egyptian Greek merchant who was actively engaged in the Indian trade, provides important details on the seaborne trade between north-eastern Africa and India departing from the Red Sea ports of Egypt as well as on the major traits of the Indian regions involved in this trade. The text dates from a relatively early phase of a significant period in Indian Ocean trade. Evidence for the trade between India and the communities of Mesopotamia, north-eastern Africa, and the Mediterranean is available by the second millennium BC at the latest and Greek traders actively partook in this trade from the second century BC onward. The Roman occupation of Egypt under Augustus ushered in a new period in this trade, an expansion on a previously unprecedented scale.<sup>27</sup>

The information contained in the *Periplus* paints a vivid and detailed picture of the period's trade in elephant tusks (Fig. 1). The region closest to Egypt where ivory could be obtained was Ptolemais Theron, although the author hastens to note that only small amounts could be acquired there.<sup>28</sup> Curiously enough, the town founded sometime between 270 and 264 BC played a subordinate role in the ivory trade, despite its proximity to Egypt and despite it having been established with the express purpose of serving as a base for elephant hunting in the south.<sup>29</sup> The first major trading post with abundant supplies of ivory was Koloe (modern Qohaito in Eritrea), lying three days' journey inland from Adulis, a town on the Eritrean coast.

However, the genuine trade centre of the tusk of savannah elephant (*Loxodonta africana* Blumenbach, 1797) arriving from the Adulis area<sup>30</sup> and from farther-lying regions, south of the Nile, from the continent's heartland, was Aksum in northern Ethiopia, lying a further five days' journey from Koloe, whence ivory was transported to Adulis and sold to the merchants arriving by sea.<sup>31</sup> Ivory was also sold on the markets of the Bāb al-Mandab, the strait between Africa and the Arabian Peninsula, where small amounts of African goods could be acquired on the strait's Arabian side, too.<sup>32</sup> Small quantities could also be procured at the trading settlement of Mosyllon on the northern Somalian coast.<sup>33</sup> An outstandingly rich source was the Rhapta region, corresponding to the Swahili coast north of Dār al-Salām in Tanzania (Fig. 2),<sup>34</sup> although according to the author, the quality of the ivory was inferior to the merchandise that was offered on the Adulis markets (Eritrea and Ethiopia).<sup>35</sup> Besides the African markets, the period's other major source was the import of Indian ivory. According to the account of the *Periplus*, one lively market was to be found in the port of Barygaza (modern Bharuch) in north-western India,<sup>36</sup> and the other region offering substantial quantities of tusks was hallmarked by Muziris (modern Kodungallur) and Nelkynda, the sub-continent's south-western ports (Fig. 1).<sup>37</sup>

At first glance, the conditions described in the *Periplus* by and large conform to what we would expect following our modern logic. However, finer details are added to the overall picture by a remark made by Pliny the Elder (d. 79), a contemporary of the *Periplus*' author, that only from India could one obtain sufficient quantities of ivory, while there was a perceptible shortage of

<sup>26</sup> Athenaeus Naucratis, *Deipnosophistae* V.201, Greek text and English translation: GULICK 1928, 408–409. For the Nubian campaign and its historical context, cf. TÖRÖK 2009, 384–390 (with further literature).

<sup>27</sup> CASSON 1989, 11–12.

<sup>28</sup> *Periplus Maris Erythraei* 3<sup>17</sup>, Greek text and English translation: CASSON 1989, 50–51.

<sup>29</sup> Strabo, *Geographica* XVI.4.7(770), Greek text and English translation: JONES 1930, 318–319; Hungarian translation: FÖLDY 1977, 793; cf. CASSON 1989, 100–101. However, it could not truly fulfil this purpose over a longer period owing to the unfavourable conditions for the large ships suitable for transporting elephants: DE ROMANIS 2020, 46.

<sup>30</sup> The Eritrean elephant population was formerly identified as forest elephants (*Loxodonta cyclotis* Matschie, 1900); however, more recent genetic analyses have demonstrated that it is related to savannah elephants (*Loxodonta africana* Blumenbach, 1797) and not African forest elephants: BRANDT et al. 2014.

<sup>31</sup> *Periplus Maris Erythraei* 4<sup>4–13</sup>, 6<sup>4</sup>, Greek text and English translation: CASSON 1989, 52–55. Cf. also BOWERSOCK 2013, 31.

<sup>32</sup> *Periplus Maris Erythraei* 7<sup>18–21</sup>, Greek text and English translation: CASSON 1989, 54–55.

<sup>33</sup> *Periplus Maris Erythraei* 10<sup>12–13</sup>, Greek text and English translation: CASSON 1989, 56–57.

<sup>34</sup> The region is alternately designated as Swahili coast and Swahili corridor in the archaeological literature.

<sup>35</sup> *Periplus Maris Erythraei* 16<sup>5</sup>, 17<sup>18–19</sup>, Greek text and English translation: CASSON 1989, 60–61; for the identification, cf. *ibid.* 45.

<sup>36</sup> *Periplus Maris Erythraei* 49<sup>29</sup>, Greek text and English translation: CASSON 1989, 80–81.

<sup>37</sup> *Periplus Maris Erythraei* 56<sup>24</sup>, Greek text and English translation: CASSON 1989, 85–86.





Fig. 2. Places and regions mentioned in the present paper's text in relation to the elephant ivory trade in eastern and north-western Africa (map: Zsolt Réti)

2. kép. A kelet- és az északnyugat-afrikai elefántcsont-kereskedelemmel kapcsolatban a tanulmány szövegében szereplő helyek és térségek (térkép: Réti Zsolt, BTK RI)

this commodity in other parts of the then known world (in this case, specifically in Africa).<sup>38</sup> His remark is underpinned by the *Periplus'* recurring assertion that only small quantities of tusk were offered in various north-eastern African regions. Although written in the third century, there is one reference to the availability of eastern

African ivory in the first century,<sup>39</sup> even if no far-reaching conclusions can be drawn regarding its amount. Even less meaningful insight is provided by cases such as the one recorded by Philostratus the Younger about the sophist Proclus, born in Naucratis but living in Athens. The passage in question mentions that Proclus

<sup>38</sup> Plinius Maior, *Naturalis historia* VIII.4.7–8, Latin text and English translation: RACKHAM 1967, 6–7.

<sup>39</sup> Flavius Philostratus, *Vita Apollonii* VI.2, Greek text and English translation: CONYBEARE 1921, 4–7.

sold ivory and other exotic goods he received from Egypt on the Athenian market,<sup>40</sup> although this should not necessarily be taken to imply that the ivory in question originated from Africa, given that the overwhelming portion of Indian ivory reached the markets of the Roman world through Egypt.

### 2.1.2. Western Africa

When interpreting Pliny's remark, it should be borne in mind that elephant herds were also to be found in regions other than eastern Africa during the Roman period. In addition to the Indian and Egyptian sources of ivory, Juvenal (d. ca. 130) was also familiar with the trade in ivory conducted through the merchants of the Maghreb in the early decades of the second century,<sup>41</sup> and the archaeological record too attests to the north-western African ivory trade.<sup>42</sup> One indication that this region did not merely participate in the trade in tusks as one of the stations along the transit route from the east is a passage in a speech delivered by Themistius (ca. 317–ca. 388), the famed orator, in the presence of the Emperor Valens (r. 364–378) in the Constantinopolitan senate in 370, in which he mentions that Libyan elephants are in danger of being wiped out completely,<sup>43</sup> no doubt owing to over-hunting. Earlier scholarship believed that a remark by John of Biclaro, a Visigoth studying in Constantinople in the 560s–570s, referred to the elephant population of this region.<sup>44</sup> He mentions that the gifts borne by a delegation of the Macurrae, identified with a population living in Mauritania Caesarensis, appearing before Justin II (r. 565–574) included elephant tusks.<sup>45</sup> However, it has more recently been proposed that the Macurrae, who had converted to Christianity, should in fact be identified with one of the population groups of Nubia.<sup>46</sup>

Although neither the late antique, nor the early medieval sources make any mention of this, the trans-Saharan trade routes leading to

western Africa (modern Mali, Burkina Faso, Guinea, and the Ivory Coast) cannot be theoretically excluded from among the potential sources of ivory.<sup>47</sup> The region's goldmines played a prominent role in the economy of the North African Arab states and it has been suggested that in the earlier tenth century, before Egypt came under Fatimid rule, the demand for ivory in the Fatimid Caliphate – then extending no farther than the Maghreb – was met by these routes.<sup>48</sup> However, next to nothing is known about their role in the preceding periods. Although gold from the western African mines presumably reached Carthage through seaborne trade, while the initial establishment of trade relations can perhaps be linked to Hanno's journey in the fifth century BC,<sup>49</sup> nothing more is heard of them after the Roman conquest. The single, albeit rather dubious source mentioning the region's elephants is Lucian (d. ca. 180), who mentions that the Garamantes, who maintained close relations with the Romans and controlled Saharan trade,<sup>50</sup> would set off on hunting expeditions to the south during winter and that their prey included elephants.<sup>51</sup> The second-century Janus statuette from Zangon Dan Makéri in southern Nigeria and coins minted in 58 BC in Gaul found in Rasseremt in Mauritania attest to possible contacts. However, their archaeological value is very limited owing to their uncertain find circumstances.<sup>52</sup> More reliable pointers are offered by recent excavations, particularly at the Kissi site in Burkina Faso (Fig. 2), whose finds, especially the glass beads recovered from the burials, suggest that this region had already maintained contact with the Mediterranean world as early as the mid-first millennium.<sup>53</sup> In the light of the above, we can hardly assume intense direct contacts that would have been suitable for the supply of larger

<sup>40</sup> Flavius Philostratus, *Vitae Sophistarum* II.21, Greek text and English translation: WRIGHT 1922, 260–261.

<sup>41</sup> Juvenalis, *Saturae* XI.123–127, Latin text and English translation: RAMSAY 1928, 228–231. For its interpretation, cf. CUTLER 1987, 441.

<sup>42</sup> CUTLER 1987, 441.

<sup>43</sup> Themistius, *Oratio* 10, English translation: HEATHER-MATTHEWS 1991, 44.

<sup>44</sup> CUTLER 1985a; CUTLER 1987, 442.

<sup>45</sup> Iohannes Biclarensis, *Chronica* 28, s.a. 573(6), Latin text: MOMMSEN 1894, 213, English translation: WOLF 2011, 56; Hungarian Translation: HORVÁTH 2008, 120.

<sup>46</sup> Cf. GATIER 1996, 921; PHILLIPSON 2009, 358; NECHAEVA 2014, 201.

<sup>47</sup> One of the few known ivory caches dating from the first millennium was discovered in Mali. Tentatively assigned to the tenth century, the cache also contained fifty-three hippopotamus tusks. Although an interpretation as a ritual deposit has been suggested, it seems more likely that it was a shipment of ivory that had been buried: INSOLL 1995.

<sup>48</sup> GUÉRIN 2013.

<sup>49</sup> LAW 1967, 188.

<sup>50</sup> For the west African connections of the Garamantes, cf. LAW 1967, 196–198; LIVERANI 2000.

<sup>51</sup> Lucianus Samosatensis, *De dipsadibus* 2, Greek text and English translation: KILBURN 1959, 76–77.

<sup>52</sup> The finds in question were not recovered from sealed contexts and thus there is no way of knowing whether they had reached western Africa around the time they were made, or perhaps such later, during the period characterised by the Arab conquest and dynamic connections, cf. MAGNAVITA 2013, 4.

<sup>53</sup> MAGNAVITA 2009, 91–92.

quantities of ivory between western Africa and the Mediterranean in the early medieval period before the tenth century.<sup>54</sup>

## 2.2. The price of ivory in the second–fourth centuries

While the *Periplus* offers but indirect data on the volume of the Indian ivory trade, a text dating from roughly a century later, from the mid-second century, provides a far more accurate picture in this respect. The text in question, known as the Muziris Papyrus (*P. Vindob G 40822*), has survived in a slightly fragmentary condition. Its recto contains the details of a contract in which one partner undertakes to transport the goods arriving from India through a Red Sea port to Alexandria and stipulates the repayment of a loan contracted in India and the details of the sanctions in the event of default.<sup>55</sup> The verso is a list of the commodities shipped to Egypt from India. In addition to being an itemised list of all the goods, to the great fortune of modern scholarship, the quantity of each ware in the cargo and their exact value are also recorded, the latter no doubt to facilitate the payment of the import duty in kind. The list features the typical products of India: pepper and eastern plants sought for their valuable oil such as nard (*Nardostachys jatamansi*) and malabathron (*Cinnamomum malabathrum*) as well as tortoiseshell and ivory.<sup>56</sup>

Accounting for ca. 1% of the cargo, ivory appears as two separate entries according to the most convincing reconstruction.<sup>57</sup> The list specifies 167 “sound”, i.e. complete tusks weighing 3228.5 kg and ivory in the form of *schidai* (σχίδαι), interpreted as trimmed tusks, which weighed roughly 538.5 kg.<sup>58</sup> Complete tusks were valued at 100 Egyptian *drachmae* per *mina*, the latter at 70 *drachmae* per *mina*. Given that the Egyptian

*mina* equalled 1/60th of a Roman talent, reckoning with the value of 95 Roman pounds to the talent as specified in the papyrus would imply that the price of 70 *drachmae* meant roughly half a kilogram (0.5111 kg) of trimmed tusks. Knowing that one Egyptian *drachma* was the equivalent of 1/100 of a Roman *aureus* and 1/4 of a Roman *denarius*, a trimmed tusk weighing 1 kg was valued at roughly 35 silver *denarii* or 1.4 *aurei* when calculating the import duty. The same values for 1 kg of complete ivory were slightly higher: 50 *denarii* or 2 *aurei*.<sup>59</sup> Since the papyrus specifies both the number of pieces and the overall weight of complete tusks, it can be easily calculated that the average weight of the tusks in this mid-second century cargo was roughly 19.3 kg and that their value was around 38.6 *aurei*. Regrettably, while the number of trimmed tusks was not recorded, the current Indian trimming practice would suggest that their weight ranged between 1 and 7 kg,<sup>60</sup> while their value between 1.4 and 9.8 *aurei*.

Obviously, the above values provide no more than broad information on the prices asked for ivory on the empire’s more distant markets after the fairly high import duty had been paid. The next piece of information offering some idea of the price of ivory comes from the onset of the fourth century. Diocletian’s *Edict on Maximum Prices* also covers ivory, fixing the price of this commodity at 150 *denarii* per Roman pound.<sup>61</sup> Regrettably enough, the interpretation of this piece of information is not as straightforward as it might appear because neither *denarii*, nor *aurei*, both general measures of value in the edict, were part of regular day to day circulation. What seems quite certain is that reckoning with an equivalent of 322.8 g to a Roman pound, the maximum price of ivory per kilogram was roughly 465 *denarii*. The relation between the *denarius* and the *aureus* remains controversial, with estimates of 1200, 1500 and 2000 *denarii* to the *aureus*.<sup>62</sup> Although Diocletian’s *aurei*, struck at 60 to the pound and weighing 5.3 to 5.5 g,<sup>63</sup> were much lighter than the *aurei* of the mid-second century with their weight of roughly 7.3 g,<sup>64</sup> the change is striking, to say the least. If we take as our starting point the value of 1500 to 2000

<sup>54</sup> LAW 1967, 190–196; MAGNAVITA 2009, 95–96; MAGNAVITA 2013, 8.

<sup>55</sup> The text’s first edition and German translation: HARRAUER–SIJPESTEIJN 1985, 130–134. Emended versions of the text appeared regularly after the first publication, which usually also proposed a new translation and interpretation: CASSON 1986, 74–76; THÜR 1987, 230–233; CASSON 1990, 196–200; DE ROMANIS 2012, 99–100; DE ROMANIS 2020, 14–29. For Muziris and its role in the period’s trade as well as for the sources of the ivory traded from here, cf. CHAKRAVARTI 2017, esp. 330.

<sup>56</sup> For the reconstruction of the cargo, cf. DE ROMANIS 2012.

<sup>57</sup> DE ROMANIS 2014, 2–18; DE ROMANIS 2017, both with an overview of earlier interpretations and his own new reconstruction based on D. Rathbone’s earlier arguments. We follow his reconstruction in the present study.

<sup>58</sup> For the weight data and the interpretation of σχίδαι as chunks of ivory removed by trimming *contra* the previously proposed interpretations, cf. DE ROMANIS 2014; DE ROMANIS 2017.

<sup>59</sup> We used the table in DE ROMANIS 2012, 101, for our calculations.

<sup>60</sup> DE ROMANIS 2014, 28.

<sup>61</sup> *Edictum de pretiis rerum venalium* 16.6a: {d}eboris libra I (*denariis*) CL, ed. LAUFFER 1971, 148.

<sup>62</sup> For a recent overview, cf. POSNER 2015.

<sup>63</sup> POSNER 2015, 7.

<sup>64</sup> DUNCAN-JONES 1994, 216, Tab. 15.2.



*denarii* to the *aureus*, regarded more realistic in recent scholarship, the maximum price in 301 was 0.31 to 0.23 *aurei*: assuming coins with a weight of 5.5 g, this would be the equivalent of 1.7 or 1.27 g of gold. Assuming 1200 *denarii* to the *aureus*, the same figures would be 0.39 *aurei* and 2.145 g of gold. The same result is received if we take the price of gold as fixed in the edict. Counting with a Roman pound of 322.8 g or 327.45 g,<sup>65</sup> 1 g of gold could be sold for 223 *denarii* in the case of the former and 220 *denarii* in the case of the latter,<sup>66</sup> meaning that ivory valued at 465 *denarii* per kilogram would equal roughly 2.08 g or 2.11 g of gold (a figure quite close to the value calculated with the 1200 *denarii* to the *aureus*<sup>67</sup>). The same figures at the time the Muziris Papyrus was drawn up were 10.22 g of gold for trimmed and 14.6 g of gold for complete tusks.

The relatively low maximised price of ivory is perhaps even better illustrated by that the asking price of 465 *denarii* for 1 kg of tusk was the equivalent of the cost of 18.75 kg beef or goat meat, 12.5 kg pork or 465 eggs.<sup>68</sup> In other words, a large tusk of the kind listed in the Muziris Papyrus could be purchased for the price of beef from one or two cattle. The main problem with the price edict as a source stems from the fact that it was issued in support of state procurements and was intended to curb inflation, meaning that sometimes much higher prices were probably asked for various commodities under market conditions than what was fixed in the edict. Yet, the comparison with daily groceries illustrates that the price of ivory at the very beginning of the fourth century was much lower than what we would have expected and that ivory was far less expensive than it was in the mid-second century. The change in prices is reflected by other merchandise, too. For example, on the testimony of the Muziris Papyrus, pepper imported from India was even cheaper than ivory, costing 6 Egyptian *drachmae* per *mina* (reckoning with 0.53

kg).<sup>69</sup> In contrast, the edict of 301 maximised the price as 800 *denarii* per Roman pound.<sup>70</sup> Thus, while in the mid-second century the price of trimmed tusk was 11.66-fold higher and that of complete tusk 16.66-fold higher than pepper, this was no longer the case by the early fourth century when pepper could be offered at a price 5.33 times higher than ivory.

Several factors influenced the changes briefly outlined in the above. Among these, the reorganisation of Indian Ocean trade in the early third century<sup>71</sup> played an at least as pronounced a role as the availability of increasingly higher quantities of African ivory. The quantity of ivory at the time the Muziris Papyrus was drawn up is illustrated by the fact that the overall volume of the commodities transported by a single ship with a significant tonnage was roughly 625 tons, of which pepper accounted for some 87% (544 tons).<sup>72</sup> The value of the entire cargo – after the import duty had been paid – was 7 million Egyptian *drachmae* or 70,000 Roman *aurei*, the equivalent of over 23,000 tons of grain. The latter was about 1% of the total yield of productive arable land in Egypt.<sup>73</sup> Obviously, we know next to nothing about how many ships of the same type as the *Hermapollon* plied the Indian Ocean annually. Writing in the 20s BC, Strabo knew of 120 ships engaged in the Indian trade,<sup>74</sup> albeit these were smaller vessels than the *Hermapollon*.<sup>75</sup> The volume of trade as recorded in the Muziris Papyrus had declined significantly by the third century, to which one contributing factor was that from the second century onward, the main markets of the southern Indian pepper trade gradually shifted eastward, towards the Bay of Bengal, doubtless intensified by the diminishing demand for Indian commodities during the third-century crisis in the Roman Empire,<sup>76</sup> which in turn had a direct impact on imports of Indian ivory, which on the testimony of the Muziris Papyrus accounted for a very small portion and overall value of the commodities imported from India.

<sup>65</sup> LAUFFER 1971, 54.

<sup>66</sup> *Edictum de pretiis rerum venalium* 31,1a–2: [aur]i obruzae in regulis sive [in] solidis (libra) I (denariis) LXXII [= 72.000], [au]ri neti (libra) I (denariis) LXXII [= 72.000], ed. CRAWFORD–REYNOLDS 1979, 176 (= 28.1a–2); the strongly fragmented Greek variant with an identical content: ed. LAUFFER 1971, 191.

<sup>67</sup> The passage on the price of gold is the principal argument of the proponents of calculations based on the equation of the *aureus* with 1200 *denarii*.

<sup>68</sup> *Edictum de pretiis rerum venalium* 4.1a: carnis[s] porcinae Ital. po. I (denariis) XII, 4.2: carnis bubulae Ital. po. I (denariis) VIII, 4.3: carnis caprinae sive verbecinae Ital. po. I (denariis) VIII, 6.43: ova n. IV (denariis) IV, ed. LAUFFER 1971, 104, 112.

<sup>69</sup> DE ROMANIS 2012, 88, 101.

<sup>70</sup> *Edictum de pretiis rerum venalium* 36,114: Piperis libra I (denariis) DCCC (ed. LAUFFER 1971, 199, cf. CRAWFORD–REYNOLDS 1979, 207) = 34,67 (ed. CRAWFORD–REYNOLDS 1979, 183).

<sup>71</sup> DE ROMANIS 2012, 75.

<sup>72</sup> DE ROMANIS 2012, 89.

<sup>73</sup> GIBBS 2012, 48.

<sup>74</sup> Strabon, *Geographica* II.5.12(117), Greek text and English translation: JONES 1917, 454–455; Hungarian translation: FÖLDY 1977, 152.

<sup>75</sup> DE ROMANIS 2020, 318–319.

<sup>76</sup> DE ROMANIS 2020, 121–124.

### 2.3. The sources of ivory in Late Antiquity

#### 2.3.1. Eastern Africa and India

The trajectory spanning half a millennium outlined by the data from the Ptolemaic period, the *Periplus Maris Erythraei*, Pliny, the Muziris Papyrus, and Diocletian's *Edict on Maximum Prices* issued in 301 would suggest that the two to two and a half centuries during which affordable Indian ivory was intensely imported provided sufficient time for the regeneration and renewed growth of the north-eastern African elephant population that had been over-hunted during the Hellenistic period. The direct trade connections established with the more southerly regions of eastern Africa extending to the Tanzanian coast likewise contributed to the replenishment of these herds. As we have seen in the above, the northern part of the Swahili coast, stretching from the southern coast of Somalia to Mozambique, appears in the *Periplus* as Rhapta (designating the zone to the Dār al-Salām region: Fig. 2);<sup>77</sup> the same region – or its northern part – is called Zingion by Cosmas Indicopleustes.<sup>78</sup> From the tenth century onward, this region became – through Egyptian mediation – the major, if not the most important source of ivory of the Mediterranean and Arab world,<sup>79</sup> and it also maintained lively connections with India. While the role played by this region in the ivory trade prior to the tenth century is known from the cited written sources, the archaeological record provides but indirect evidence. Although ivory deposits are few and far between in the hinterland of the Swahili coast in the first millennium,<sup>80</sup> several have been reported from the eastern coast of the Republic of South Africa. Three sites in the province of KwaZulu-Natal (Fig. 2) yielded impressive quantities of unworked and partially worked ivory, whose examination – principally by <sup>87</sup>Sr/<sup>86</sup>Sr analyses – indicated that it originated from the broader region (and not solely from the sites' immediate area), attesting to the extensive and well-organised collection of ivory.<sup>81</sup> The

accumulated ivory and various other objects identified as commodities of the Indian Ocean trade such as glass beads and pottery brought to light on the sites would imply that the region had partook in long-distance trade well before the tenth century, in all likelihood as the supplier of the Swahili coast.<sup>82</sup> In the lack of any data, there is no way of knowing to what extent this supply or possibly even more distant sources contributed to the relative abundance of ivory in Late Antiquity or to what extent it drew from the replenished stock of the Ethiopian elephant population.

What we do know is that in the mid-fourth century, the *Expositio totius mundi et gentium* reports that *India minor* "is teemed with elephants". The context clearly reveals that the toponym designates north-eastern Africa. The anonymous author also notes that ivory from this region reached not only the Roman world, but also Sasanian Persia.<sup>83</sup> Given the distinctiveness of its imagery, it is perhaps more than simply a visual convention that on one of the Piazza Armerina mosaics, made slightly earlier, in the 320s–330s, most likely by a north-western African workshop, the personification of Africa holds an elephant tusk in one hand and is flanked by an elephant and a phoenix on one side and a tiger and another tusk on the other (Fig. 3).<sup>84</sup> In the earlier fifth century, Philostorgius declared that the high number of elephants was one of most striking natural resources of Aksum and its broader region, which was of importance to the Mediterranean world too.<sup>85</sup> Writing in the mid-sixth century in Alexandria, Constantine of Antiochia, better known as Cosmas Indicopleustes in later manuscripts, who had personally visited Adulis and Aksum in the 520s,<sup>86</sup> was aware that ivory from

<sup>77</sup> See notes 34–35.

<sup>78</sup> Cosmas Indicopleustes, *Topographia christiana* II.30, Greek text and French translation: WOLSKA-CONUS 1968, 334–335; English translation: McCRINDLE 2010, 38.

<sup>79</sup> HORTON 1987; HORTON 2018. Chronologically, this coincides with the abandonment of the Norse settlements in Greenland, which some scholars explain by the dramatic drop in the price of ivory (for a comprehensive discussion, cf. SEAVER 2009).

<sup>80</sup> The Limpopo valley was an important source of ivory on the Swahili coast: HANISCH 1981.

<sup>81</sup> COUTU et al. 2016, 19–20.

<sup>82</sup> COUTU et al. 2016, 20–22.

<sup>83</sup> *Expositio totius mundi et gentium* 18, Latin text and French translation: ROUGÉ 1966, 152–153; Latin text and English translation: WOODMAN 1964, 4, 28; Hungarian translation: BRAUN-FERENCZI-GRÜLL 2012, 88. For the dating of the text, cf. GRÜLL 2012, 85. For the usage of the term "India" in the late antique sources, cf. also GATIER 1996, 903; POWER 2012, 69; BOWERSOCK 2013, 23.

<sup>84</sup> CARANDINI-RICCI-DE VOS 1982, 229, Fig. 131, Pl. XXXI.60. For the uniqueness of the depiction and that the master making the mosaic did not draw his inspiration from the natural reality, despite the mosaic having been made by an African workshop, cf. CUTLER 1985b, 128. The image is regarded as a personification of India by CARANDINI-RICCI-DE VOS 1982, 230; in contrast, TOYNBEE 1973, 29, 50, makes a case for the more generally accepted personification of Africa. For elephant portrayals symbolising Africa, cf. TOYNBEE 1973, 50–52.

<sup>85</sup> Philostorgius, *Historia ecclesiastica* III.6, English translation: AMIDON 2007, 43.

<sup>86</sup> Cf. BOWERSOCK 2013, 25, 133.



Fig. 3. Personification of Africa on the Great Hunt mosaic floor in Piazza Armerina (Province of Enna, Sicily) (after CARANDINI-RICCI-DE VOS 1982, Pl. XXXI.60)

3. kép. Afrika perszonifikációja a Piazza Armerina-i Nagy Vadászat mozaikon (Provincia di Enna, Szicília) (CARANDINI-RICCI-DE VOS 1982, Pl. XXXI.60. nyomán)

*Aethiopia* had reached not only the East Roman lands and Persia, but that tusks also made their way to India and the Himyarite Kingdom in Yemen. While his testimony confirms that similarly to the earlier centuries, Indian rulers had their own elephant herds, it would nevertheless seem that the main direction of ivory trade had shifted to some extent as compared to the first centuries of the Roman Imperial period.<sup>87</sup> The remark on the abundant elephant population of north-eastern Africa in the *Christian topography* is borne out by Nonnosus, a contemporary, who travelled to Ethiopia, Himyar, and the land of the Saracens as an envoy of Justinian I (r. 527–565). Of his journey in Ethiopia, he recorded that he had seen some 5000 elephants grazing near Ave, lying between Adulis and Aksum, whose distance, in contrast to the *Periplus*, he specifies as a fifteen days' journey.<sup>88</sup> The region's prominent role is also underscored by John of Biclaro's narrative about the gift of elephant tusks presented to Justin II by the Macurritae, insofar as the dele-

gation in question had indeed arrived from Nubia.<sup>89</sup>

Yet, the narrative contained in the *Christian topography* that African ivory was exported to India should not necessarily be taken to imply that trade in the opposite direction had ceased altogether. While there is no written source to conclusively confirm this, a few scattered references to this effect are known from the period. Gregory of Nyssa speaks of the import of Indian ivory as one of the self-evident facts of life in the later fourth century,<sup>90</sup> and a controversial reference in one of Claudian's poems written in the early fifth century can be interpreted in the same vein.<sup>91</sup> Obviously, these references do not betoken any measure of certainty, as neither does a diptych of Justinian I made in the 530s, whose lower register shows a man holding an ivory tusk standing beside an elephant in front of the emperor, who, as it has been suggested by some scholars, possibly portrays an Indian on the strength of his attire.<sup>92</sup> Aside from the differences in the price and quality of ivory from different regions, natural and cultural factors can also be assumed in the maintenance of a two-way traffic in the ivory

<sup>87</sup> Cosmas Indicopleustes, *Topographia christiana* XI.22–23, Greek text and French translation: WOLSKA-CONUS 1973, 352–355; English translation: MCCRINDLE 2010, 371–372. For an overview of the relevant scholarly literature on the author, the text's date, and Book XI, probably added at a later date, cf. BOLLÓK 2013, 148.

<sup>88</sup> Photius, *Bibliotheca* 3, Greek text and French translation: HENRY 1959, 6; English translation: FREESE 1920, 19. Nonnosus' lost work is only known from Photius' summary.

<sup>89</sup> See above, p. 45.

<sup>90</sup> Gregorius Nyssenus, *Homilia 3 in Ecclesiasten*, English translation: HALL-MORIARTY 1993, 66.

<sup>91</sup> See below, pp. 51–52.

<sup>92</sup> DELBRUECK 1929, 192–193; KOLLWITZ 1959, 1117.

trade. One of these is that among African elephant species, both males and females have tusks, while only males in Indian elephant populations, and thus an African population of the same size would, at least theoretically, mean twice as many tusks. However, it should also be borne in mind that significant numbers of elephants were kept as domestic animals in India, a practice that is not, or only truly exceptionally, attested in the African regions representing the elephants' natural habitats in Antiquity,<sup>93</sup> and that the tusks of domestic elephants were regularly trimmed every few years by sawing off the lower third.<sup>94</sup> While this meant a regular supply of smaller chunks of tusks, the overall proportion of complete, intact tusks from India was much smaller than from Africa. The differences in quality between the ivory originating from different regions are mentioned in several passages of the *Periplus*. Finally, prices as well as the proportion of exports and imports could equally well have been shaped by state regulations. Regarding conditions in the Roman Imperial period, we know that there was a substantial flow of gold from Rome to India owing to the latter's export surplus and it is therefore less than surprising that despite the hefty revenues from import duties, the Roman administration was less than happy with the enormous demand for Indian luxury commodities.<sup>95</sup> No matter how large a portion ivory from India accounted for on the markets of the Roman world after the third century, we have no reason to doubt the primacy of African sources in Late Antiquity in the light of the available sources, even if neither the differences in the traits of raw ivory once processed and worked,<sup>96</sup> nor the suggestions based on the size of ivory objects<sup>97</sup> provide any secure pointers for distinguishing between the two sources. Thus, any conclusive evidence in this respect can only be expected from archaeometric analyses.

### 2.3.2. North-western Africa

In contrast to eastern African elephants and ivory, western Africa is last mentioned in Themistius' speech delivered in Constantinople in 370. Nevertheless, there is a general consensus in the period's scholarship that this elephant

population only became extinct later, probably in the sixth or seventh century.<sup>98</sup> Nothing certain is known about the numbers of tusks appearing on the markets during the last centuries, and neither do we have reliable data on the trade routes leading north from the western African sub-Saharan region during the period discussed here.<sup>99</sup>

### 2.4. Transportation of elephants as live animals in the late antique east and west

While the first elephants arriving to Italy in the third century BC were exploited for military purposes, they were later transported to Rome to be displayed during various games. A profound change can be noted during the last century of the undivided Roman Empire; by the fifth century, we witness the disappearance of the elephants captured in Africa and then transported to Italy as live animals. One of the authors of the *Historia Augusta*, a source of dubious reliability, reports that thirty-two elephants were paraded during the games held in the mid-third century, on the occasion of the one thousandth anniversary of the foundation of Rome, most of which were part of the booty from the successful Persian campaign of Gordian III (r. 238–344).<sup>100</sup> The same source records that twenty elephants appeared in the procession celebrating the victory won by Aurelian (r. 270–275) over Palmyra in 274.<sup>101</sup> In addition to the above, Sicilian floor mosaics from the earlier fourth century depict scenes showing how elephants were captured and transported over the sea, the most renowned among these undoubtedly being the Great Hunt mosaic of the Piazza Armerina villa (Fig. 4).<sup>102</sup>

The letters written by Symmachus,<sup>103</sup> head of an extremely wealthy and influential aristocratic family with large estates in several of the empire's provinces provide ample evidence that he was able to procure exotic African beasts for the games celebrating his son's questorship in 393 and his praetorship in 401. His surviving correspondence, in part conducted with African officials for seeking out and acquiring the animals, mentions lions, *leopardi* (most likely maneless lions), antelopes, and crocodiles. While the latter quite certainly refers to creatures from the Nile

<sup>93</sup> CASSON 1993, 249; COBB 2016, 203.

<sup>94</sup> DE ROMANIS 2014, 14–18.

<sup>95</sup> CASSON 1989, 17.

<sup>96</sup> Cf. CUTLER 1987, 438; VON BARGEN 1994, 55–56.

<sup>97</sup> CUTLER 1985a, 27–29; the rule of thumb introduced by CUTLER 1993, 8, that ivory objects suggesting a tusk diameter exceeding 11 cm were made from African elephant tusk can be rejected in the light of the dimensions of the Indian tusks of the pre-Modern Age, cf. VON BARGEN 1994, 56–57.

<sup>98</sup> ZEUNER 1963; CUTLER 1987, 442.

<sup>99</sup> Cf. pp. 45–46.

<sup>100</sup> *Historia Augusta, Gordiani Tres* 33.1–3, Latin text and English translation: MAGIE 1993, 442–445. Cf. JENNISON 1937, 92.

<sup>101</sup> *Historia Augusta, Divus Aurelianus* 33.4, Latin text and English translation: MAGIE 1998, 258–259.

<sup>102</sup> CARANDINI-RICCI-DE VOS 1982, 219, Fig. 123, Pl. XXIX. 58.

<sup>103</sup> For a vivid portrait of the man and his estates, cf. BROWN 2012, 16–17, 93–119.



Fig. 4. Captive elephant on the Great Hunt mosaic floor in Piazza Armerina (Province of Enna, Sicily) (photo: Ádám Bollók)

4. kép. Elfogott elefánt a Piazza Armerina-i Nagy Vadászat mozaikon (Provincia di Enna, Szicília) (fotó: Bollók Ádám)

Valley, i.e. north-eastern Africa, the former could equally well be procured from Egypt or the Maghreb, while a Mesopotamian origin cannot be rejected out of hand in the case of lions.<sup>104</sup> Elephants were an entirely different case: not even an aristocrat as wealthy and as high-ranking as Symmachus attempted to have them brought to Rome. Whether this can be ascribed to the tradition that these noble beasts were imperial prerogatives or merely that their acquisition was too costly and a highly uncertain endeavour remains unknown.

Yet, there is an oblique reference that the idea of transporting a few elephants to Italy had perhaps been entertained in the emperor's entourage at this time. Claudian's panegyric to Flavius Stilicho (ca. 359–408) serving as *magister militum* under Honorius (r. 393–395–423) seems to suggest that elephants had been included on the list of animals to be brought to Italy for the *venatio* staged as part of Stilicho's consular games in 400, although, in the end, he was content with procuring tusks. After describing the animals arriving from Africa, Claudian continues as follows:

Then Latonia collected grey-spotted leopards  
and other marvels of the south and huge  
ivory tusks which, carved with iron into  
plaques and inscribed with the consul's

name in shining gold, should pass in  
procession among lords and commons. All  
India stood in speechless amaze to see many  
an elephant go shorn of the glory of his  
tusks. Seated upon their black necks despite  
their cries the goddess shook the fix fed  
ivory and tearing it up from its bloody roots  
disarmed the monstrous mouths. Nay, she  
fain would have brought the elephants  
themselves as a spectacle but feared that  
their vast weight would retard the ship.<sup>105</sup>

One curious aspect of this passage is that it speaks not only of the genuine option of transporting live animals at the onset of the fifth century, but also of the potential availability of Indian in addition to African ivory in Italy. It is a thornier issue whether Claudian's cited passage merely implies that the existence of two different sources was still common knowledge in Italy at this time, irrespective of the source of the tusks in question, or whether it should be taken at face value to denote genuine Indian imports. Adding to the confusion is that as we have seen in the foregoing in relation to the *Expositio totius mundi*

<sup>104</sup> JENNISON 1937, 95–97.

<sup>105</sup> Claudius Claudianus, *De Consulatu Stilichonis* III.345–355, Latin text and English translation (slightly modified after CAMERON 2013, 205); PLATNAUER 1998, 66–67; Hungarian translation: MEZEI 1988, 108.



*et gentium*, the term India or *India minor* was also used to denote eastern Africa and the Red Sea region from the fourth century onward.<sup>106</sup> We should also bear in mind that the choice of suitable words for the metre was at least as important as geographical accuracy to the author who had couched his poem in a mythological narrative.<sup>107</sup>

In any case, nothing more is said about the display of live elephants at *venationes* in Italy during later periods. The fifth century did not mark a similar break in the transportation of these large beasts in the eastern empire and it might therefore be instructive to briefly review the available information before discussing at greater length a reference in Claudian's poem that has some relevance for the ivory objects of both regions.

Of the sources relating to the easterly regions, mention must first be made of Timotheus of Gaza's book from the sixth century, in which he mentions a man dealing in "Indian" wares travelling northward from Aila (modern Eilat, Israel, and Aqaba, Jordan), who was seen passing through Gaza with two giraffes and an elephant, creatures he was taking to the court of Anastasius (r. 491–518) in Constantinople to be shown at the games held in the capital.<sup>108</sup> The event in question was probably identical with the one recorded for the year 496 by Marcellinus (d. ca. 534) in his chronicle, in which he mentions an elephant and two giraffes sent to the emperor from India.<sup>109</sup> If for nothing else, the giraffes should certainly be suspect that the source of this particular gift was *India minor* rather than the subcontinent.<sup>110</sup> Half a century later, a delegation from north-eastern Africa – again designated as "Indians" in the sources – sent to Justinian I presented the emperor with an elephant, which was shown off to the city's population during the games held in the

Hippodrome.<sup>111</sup> A reference to the marine transportation of elephants from north-eastern Africa can be found in the Elephant Sura of the Qu'ran, commemorating the elephant participating in the campaign against Mecca led by Abraha, the Christian ruler of Ḥimyar.<sup>112</sup> Given that Abraha, a former confidante of the monarch of Aksum conquering Ḥimyar, had imposed his control over the south-westerly region of the Arabian Peninsula, his elephant had no doubt reached Arabia from Ethiopia.

Another typical source of these beasts can be presumed from John of Ephesus' account of the events of the later sixth century, among which he mentions that elephants, part of the spoils captured from the Sasanian army, were taken to Constantinople. These were Indian elephants kept in captivity that could be trained for certain tasks, as shown by the story about them. It so happened that their new masters taught them to make the sign of the cross with their trunk whenever they passed a church and to bow down in front of the emperor and make the sign of the cross when they were paraded in the Hippodrome before horse races.<sup>113</sup> The capture of these elephants can be linked to the Armenian campaign of Ḥusraw Anūšīrvān I (r. 531–579) in 576, and thus John of Ephesus's narrative can be dated to the 570s–580s, to the reigns of Tiberius II (r. 574–578–582) and Maurice (r. 582–602).<sup>114</sup> Fame of the imperial city's elephants spread to distant lands: Gregory of Tours heard about them in the west,<sup>115</sup> and Theophylact Simocatta recorded that in the last year of Tiberius II's reign, the Avar khagan demanded that the emperor send him one of his elephants. The request was fulfilled by Maurice, the new emperor, but the khagan, displeased with the "gift", sent the animal back to Constantinople.<sup>116</sup>

<sup>106</sup> See. note 83, and cf. also CUTLER 1987, 440.

<sup>107</sup> CUTLER 1985a, 22; CUTLER 1987, 438.

<sup>108</sup> Timotheus Gazaetus, *De animalibus* 24, Greek text and English translation: HAUPT 1869, 15; BODENHEIMER–RABINOWITZ 1949, 31.

<sup>109</sup> Marcellinus Comes, *Chronica* [s.a 496] 2, Latin text and English translation: CROKE 1995, 31–32; BROWN 2018, 96, argued that the giraffes brought to Constantinople by the African envoy were taken to the imperial animal park. Although our sources clearly state that the elephant brought by the delegation to the city in 549/550 was displayed in the Hippodrome, this does not in itself imply that the animal had not been subsequently taken to the animal park, since by this time, these truly rare creatures would only have been killed during games on very special occasions (cf. the literature cited in note 111), as was the practice in late Republican and Imperial Rome.

<sup>110</sup> Cf. GATIER 1996, esp. 919–920.

<sup>111</sup> Malalas, *Chronographia* XVIII.106 (549/550 AD), English translation: JEFFREYS–JEFFREYS–SCOTT 1986, 289; Theophanes, *Chronographia* s.a. 6042AM = 549/550 AD, English translation: MANGO–SCOTT 1997, 331.

<sup>112</sup> *Quran* 105, for the historical context, cf. BOWERSOCK 2013, 116–117.

<sup>113</sup> Iohannes Ephesinus, *Historia ecclesiastica* II.48, English translation of the Syriac text: SMITH 1860, 161–163.

<sup>114</sup> For the dating of the events, their contexts, and the relevant sources, cf. RANCE 2003, 371, esp. note 79.

<sup>115</sup> Gregorius Turenensis, *Historia Francorum* V.30, English translation: THORPE 1974; Hungarian translation: MEZEI-ADAMIK 2010, 355.

<sup>116</sup> Theophylactus Simocatta, *Historiae* I.3.8–10, English translation: WHITBY–WHITBY 1986, 24; Hungarian translation: OLAJOS 2012, 77.



Fig. 5. Elephant depiction on the mosaic floor of the “Birds Mosaic Mansion” in Caesarea Maritima (Israel)  
(photo: Ádám Bollók)

5. kép. Elefántábrázolás a Caesarea Maritima-i „Birds Mosaic Mansion” mozaikpadlóján (Izrael) (fotó: Bollók Ádám)

The sources briefly reviewed in the above are unsuitable for drawing any far-reaching conclusions – they merely indicate that the emperors of Constantinople were still able to procure elephants in the fifth and sixth centuries. These included both Indian elephants captured during the wars fought with the Sasanians who used them when they besieged fortified towns and for logistic purposes,<sup>117</sup> and African ones through the diplomatic and commercial connections maintained with the north-eastern African region. Although our sources contain few details, the former was possibly less frequent. The elephant bones bearing signs of violent death brought to light during the metro excavations in Istanbul<sup>118</sup> can perhaps be taken as an indication that this noble beast had appeared in one or another *venatio* held in the city, but reveal nothing about how frequent this might have been. The mosaics bearing various elephant depictions known from the eastern provinces hardly attest to a personal familiarity with what this animal actually looked like, but rather seem to echo the typical elements of the portrayals in the period’s pattern books (Fig. 5).<sup>119</sup>

In any case, live elephants only reached the European regions of the former Roman Empire on rare occasions during the ensuing centuries.

The best known among them is the white elephant by the name of Abū al-‘Abbās – transliterated as Abul Abaz in Latin<sup>120</sup> – sent by the Abbasid caliph Hārūn al-Rašīd (r. 786–809) to Charlemagne (r. 768–800–814). Quite understandably, this diplomatic gift, laden with symbolic meaning in the eastern tradition, could only be conceived on the highest diplomatic level between the period’s most powerful sovereigns.<sup>121</sup> Accordingly, elephants were acquired by the rulers of Constantinople on rare occasions only during the Middle Byzantine period, while they could be seen more regularly in the courts of Muslim caliphs, especially in the more easterly regions.<sup>122</sup>

#### 2.5. The price of ivory from the later fourth to the mid-sixth century

Following the above brief discussion illuminating the background to the gradual decline in the export of live animals and its relevance for the elephant sent to the Avar khagan, let us return to another, no less interesting point in Claudian’s above-cited panegyric: the carved ivory panels inscribed with golden letters proclaiming Stilicho’s fame. It requires no great flight of the imagination to recognise the reference to

<sup>117</sup> RANCE 2003.

<sup>118</sup> ONAR 2013, 143, Fig. 7.

<sup>119</sup> Cf. the discussion in CUTLER 1985b.

<sup>120</sup> *Annales Regni Francorum* s.a. 802, ed. KURZE 1895, 117.

<sup>121</sup> Cf. HARDT 2017.

<sup>122</sup> For a brief discussion, cf. ŠEVČENKO 2002, 76–78.

presentation diptychs, one of the undoubtedly most remarkable genres of late antique carved ivories that became highly popular during the final decades of the fourth century.<sup>123</sup>

The indirect forerunners of these pairs of leaves can be traced to at least the first century, to the imperial letters of appointment sent to the provincial governors known as *codicilli*, “little books”, which were assembled from two or, if necessary, more wooden panels joined by cord or metal clasps, while the text was written onto the wax-coated inner side. It would appear that with time, some appointments began to be written on papyrus which was then enclosed between the panels, which thus functioned as envelopes. Although our sources fail to reveal how widespread this practice actually might have been, it would seem that in the fourth century, some of these “envelopes” were carved of ivory or made of precious metal, particularly in cases of the appointment of higher-ranking officials. If made of ivory, the outer side probably bore the name and/or portrait of the emperor, while the panels or their inscriptions were occasionally gilded.<sup>124</sup> The fact that the wooden panels of the earlier Imperial period were in the later Roman period replaced by ones carved of ivory seems to indirectly confirm the low price of ivory, as also shown by the price edict issued in 301. It should here be recalled that writing tablets carved of ivory – even if their size was in all likelihood much smaller than of the fourth-century diptychs<sup>125</sup> – are mentioned by Martial in the last quarter of the first century,<sup>126</sup> and their existence is confirmed by an actual find, perhaps dating

from the third century.<sup>127</sup> A letter written by St. Augustine around 390 would suggest that ivory writing tablets remained in use even around the time of the appearance of presentation diptychs, notwithstanding that in view of their high value, these tablets were obviously only used by the wealthy for regular correspondence.<sup>128</sup> Mention is also made of *calculi eburnei* inscribed with the names of the proconsuls that were read out in the presence of the judges for the assembled citizens of Carthage in the early fifth century,<sup>129</sup> which some scholars believe to have been ivory writing tablets.<sup>130</sup> However, given the passage’s broader context, *calculi* could equally well refer to the gaming pieces used in board games, and thus the interpretation of the bishop of Carthage’s words remains somewhat uncertain.<sup>131</sup>

It seems quite likely that the carved ivory “envelopes” used in imperial administration served as the models for the similar carved tablets commissioned by the aristocrats of the later fourth century with a view to commemorating significant events in the family’s life, which they then distributed among their friends. Ivory diptychs of this type are first mentioned in a decree issued by the emperor and co-emperors of the Eastern Roman Empire in 384, which forbade all but the consuls to present gifts of ivory diptychs on the occasions of games provided by them.<sup>132</sup> In all likelihood, the rationale behind this prohibition was the increasingly widespread nature of this practice or, better said, the regulation of the sums spent on games with a view to easing the financial burdens of officials of lesser means.<sup>133</sup> On the testimony of the surviving diptychs, the regulation was effectively implemented: the currently known diptychs demonstrably made in the eastern empire can all be linked to games given by the consuls of Constantinople – even if most of these finds come from the sixth century. The decree of 384 also reveals that the custom of giving ivory presentation diptychs spread from east to

<sup>123</sup> In his studies on the commissioners and the function of diptychs, Alan Cameron convincingly argued that the objects generally designated as consular diptychs should rather be termed presentation diptychs: CAMERON 1982; CAMERON 2013; CAMERON 2017.

<sup>124</sup> For a comprehensive review of the forerunners and early history of diptychs, cf. CAMERON 2013, 175–179; for additional useful data, cf. DELBRUECK 1929, 3–16, KOLLWITZ 1959, 1009–1110 (both with some interpretations that have since been discarded). The practice of gilding is suggested by Themistius’s repeated references to carved gilded ivory tablets and “tablets made of gold” as symbols of high offices, similarly as John Chrysostom speaks of “gold writing tablets” in a like sense. Themistius, *Oratio* 18 (224), *Oratio* 23 (292–293): for the Greek text, see DELBRUECK 1929, XLVII, for the English translation, see PENELLA 2000, 118, 120. Iohannes Chrysostomus, *In illud: Vidi dominum* II.2<sub>88–90</sub>, Greek text and French translation: DUMORTIER 1981, 96–97. For the interpretation of these *loci*, cf. DELBRUECK 1929, 5; CAMERON 2013, 175–176, 178; CAMERON 2017, 318–319.

<sup>125</sup> CAMERON 2017, 305, 319–320.

<sup>126</sup> Martialis, *Epigrammata* XI.5, Latin text and English translation: SHACKLETON BAILEY 1993, 228–229.

<sup>127</sup> VISCONTI 1874; CAMERON 2017, 306–307, Fig. 2; for the proposed dating, cf. CAMERON 2017, 305.

<sup>128</sup> Aurelius Augustinus, *Epistula* XV.1, English translation: PARSON 1951, 36. For the interpretation of St. Augustine’s *tabellae eburneae* used for correspondence, cf. ZIELINSKY-KINNEY 2017, 310, 316–317; CAMERON 2017, 315–317.

<sup>129</sup> Quodvultdeus Carthaginensis, *Liber promissionum et praedicatorum Dei* XIII.15, Latin text and French translation: BRAUN 1964, 664–667.

<sup>130</sup> DELBRUECK 1929, 10; BOWES 2001, 342–343, 354, note 24.

<sup>131</sup> BOWES 2001, 354, note 24; CAMERON 2013, 192, note 76.

<sup>132</sup> *Codex Theodosianus* 15.9.1, English translation: PHARR 1952, 435.

<sup>133</sup> CAMERON 1982; CAMERON 2013, 181; CAMERON 2017, 315.

west, where there were no legal restrictions on their use and, judging from the number of surviving exemplars, neither was one passed at any time.<sup>134</sup>

The majority of the currently known early diptychs were carved in Rome in the 390s–400s and they generally commemorate notable events in the lives of the aristocratic families of the *Urbs*, such as appointment to a leading office, a marriage, or a funeral.<sup>135</sup> Stilicho's presentation diptychs commissioned for the Milan games celebrating his consulship mentioned by Claudian were contemporaneous with the pieces made in Rome in the 390s–430s, an indication that the custom first attested in Constantinople had gained popularity in the imperial court of the Western Roman Empire, too. As far as we know, none of the carved panels made for this particular occasion have survived; however, the two leaves of a diptych portraying the *magister militum* alongside his wife and son, probably made in the 390s – most likely in 396 – have by lucky chance weathered the centuries.<sup>136</sup> There are a few carvings which were made with a view to commemorating events similar to the games provided by Stilicho, which are generally dated to the onset or the early decades of the fifth century on stylistic grounds. However, these do not bear any inscriptions or visual elements that would enable the identification of the portrayed persons or events, or of the latter's location and time, or of the place and date where and when they were made. These pieces are therefore dated on the strength of their stylistic affinities with pieces that have a known provenance and can be securely dated, and are generally considered to have been made in Rome or more broadly in northern Italy. Nevertheless, we cannot reject out of hand the possibility that some of these diptych leaves include exemplars from the eastern empire, even if there is nothing to confirm this beyond any shadow of doubt: the association with the eastern capital of a single fifth-century diptych, probably commissioned by one of the Constantinopolitan consuls in 414, is also based on indirect evidence.<sup>137</sup> It seems likely that the Venatio Leaf in the Louvre originates from one of the western provinces since the patron providing

the *venatio* wears a crown, suggesting that he had organised the games as a priest of the imperial cult.<sup>138</sup>

While the number of diptychs presented as gifts on particular occasions is not known, a few references would nevertheless suggest that considerably more than a mere handful were made to commemorate a certain event. We learn from Symmachus' letters that a diptych and a silver bowl weighing two pounds were customary parts of the "gift parcels" sent to the prominent individuals with whom the family maintained good connections on the occasion of the games organised in Memmius's name. In Rome, this "parcel" conformed to the gifts generally handed out when questorian and praetorian games were held, and the other contemporaneous sources leave no doubt that this practice was not exclusive to the *Urbs*.<sup>139</sup> Moreover, Claudian's above-cited poem clearly alludes to the fact that on the occasion of Stilicho's consular games, diptychs were presented not only to the high and mighty, but also to a part of the common folk.<sup>140</sup> Finally, in some instances it seems likely, in others it is quite certain that the diptychs commissioned for a particular occasion were carved with differing iconographies.<sup>141</sup> Thus, we have good reason to believe that the surviving pieces represent but a fraction of the many hundreds handed out on each occasion already at the end of the fourth century,<sup>142</sup> to the extent that Richard Delbrück, who assembled the detailed catalogue of these diptychs argued that tens of thousands of diptychs had probably been made between the final decades of the fourth and the earlier sixth century, and that their overall number probably ran into hundreds of thousands.<sup>143</sup>

Obviously, we have no way of knowing what price was asked for the carved leaves, either individually or in their entirety, commissioned by various officials and members of the elite – but we do have some idea of the vast sums spent by Roman aristocrats on their own or their sons' praetorian games in the earlier fifth century. Olympiodorus records that Probus spent 1200 pounds of gold on his games in the early 420s, Symmachus spent 2000 in 401, while Maximus spent 4000 around 411, the equivalent of 86,400,

<sup>134</sup> The appearance and the main phases in the history of the type have been covered by CAMERON 2013.

<sup>135</sup> CAMERON 2011, 712–740; CAMERON 2013, 185.

<sup>136</sup> DELBRUECK 1929, 247–248; CAMERON 1982, 126; TORP-KIILERICH 1989; CAMERON 2016. The diptych's association with Stilicho has been recently challenged by VON RUMMEL 2007, 206–211.

<sup>137</sup> CAMERON 2015.

<sup>138</sup> DELBRUECK 1929, 9, 221–223, N57; KOLLWITZ 1959, 111; VOLBACH 1970, 53, Nr. 58; ALFÖLDI-ROSENBAUM 1983, 34, 36–37; CAMERON 2013, 182.

<sup>139</sup> CAMERON 2013, 179–180, 205–206.

<sup>140</sup> CAMERON 2013, 205.

<sup>141</sup> Cf. CAMERON 2011, 716–730; CAMERON 2013, 185.

<sup>142</sup> CAMERON 2017, 301–302, 311.

<sup>143</sup> DELBRUECK 1929, 10.

144,000, and 288,000 *solidi*, respectively.<sup>144</sup> Quite obviously, the expenditures of others and the expenses of other occasions were by no means as extravagant.<sup>145</sup> It hardly seems likely that the carved ivories had accounted for the greater portion of the costs. Suffice it here to recall that according to the price edict of 301, the price of a first-class African lion was maximised at 150,000 *denarii*, a second-class lion at 125,000 *denarii*, while the price of first- and second-class lionesses was 125,000 and 100,000 *denarii*, respectively; the acquisition of a leopard of the first or second class cost 100,000 or 75,000 *denarii*, respectively.<sup>146</sup> As we can see, even the cheapest beast cost 160-fold more than a kilogram of ivory, while a first-class lion was 300-fold more expensive. Obviously, when making comparisons, it should be borne in mind that a larger tusk or, better said, its middle section, sufficed for no more than one to three pairs of leaves, depending on the size of the diptych.<sup>147</sup> The tusk's two ends could be used for producing a variety of other objects and therefore the person who commissioned the diptych did not necessarily have to pay for the entire tusk. Even so, the overall cost of the 10–12 kg of raw ivory needed for one or two pairs of leaves can be estimated as 4500–5500 *denarii* at the 301 price of ivory, without the wage of the *eborarius*, which is not mentioned in the edict.<sup>148</sup> Symmachus' silver bowls weighing two pounds would have cost much more: calculating with a price of 6000 *denarii* per pound of silver and the wage of 300 *denarii* specified for a first-class goldsmith<sup>149</sup> adds up to 12,600 *denarii*. Obviously,

prices and their proportions relative to each other undoubtedly changed from one period to the next, yet there seems to be no reason to assume a drastic rise in the price of ivory, at least judging from the number of diptychs suggested by the sources.

In the light of the above, it would be a reasonable assumption that the conditions at the turn of the century had undergone a fundamental transformation in the wake of the political changes in the earlier fifth century, meaning that the late Roman situation cannot be automatically projected onto the subsequent centuries. Yet, it would appear that the new political constellation with its far-reaching consequences had little impact on the circulation of ivory in the empire's western half. Even if traffic along the trade routes had indeed diminished or had even come to a temporary standstill after the Vandals established themselves in North Africa, this did not apparently lead to a halt in the flow of raw ivory reaching Italy or, in a broader context, the post-Roman west. The availability of ivory on the markets of Italy and the "west" in the middle third of the fifth century and in the ensuing period is indicated by two circumstances. Firstly, the diptychs which on the strength of their inscriptions can be securely associated with Italian or, in a broader sense, western persons and/or events.<sup>150</sup> The ivory pyxides and other carved ivories made between the fifth and seventh centuries that are believed to have been made in workshops active in the west,<sup>151</sup> even if the location of one or another workshops is occasionally challenged,<sup>152</sup> can also be assigned here. Research in this field is bedevilled by the fact that workshop finds indicating places of production have so far only been reported from fourth-<sup>153</sup> and sixth–seventh-century Rome,<sup>154</sup> and late antique Alexandria.<sup>155</sup> The written sources add little to the already known workshops: a decree mentioning the ivory carvers (*eborarii*) of Constantinople issued in 337,<sup>156</sup> a letter written by Cyril, Patriarch of Alexandria (ca. 376–444) in the 430s, in which he meticulously lists the various influential people in the Constantinopolitan court to be bribed through

<sup>144</sup> Olympiodorus Thebaicus, *Historiae* Frg. 41.2 (ed. Blockley) (= Frg. 44, ed. Müller), Greek text and English translation: BLOCKLEY 1983, 204–207. For the interpretation of the text and the persons mentioned in it, cf. PLRE II.749–751 s.v. *Petronius Maximus* 22; CAMERON 1984; for the sums, cf. BROWN 2012, 16–17.

<sup>145</sup> Let us take, for example, the case of Symmachus: compared to the expenditure of 2000 pounds of gold for Memmius's praetorian games, he spent considerably less on his own consular games, at least judging from the value of the gifts he handed out on the two occasions, cf. CAMERON 2013, 205–206.

<sup>146</sup> *Edictum de pretiis rerum venalium* 32.1–6, ed. CRAWFORD–REYNOLDS 1979, 179. For earlier prices, cf. also BOMGARDNER 2001, 211.

<sup>147</sup> VON BARGEN 1994, 51, Abb. 3.

<sup>148</sup> CAMERON 2013, 185–186, regarded this as rather high compared to the price of raw ivory, while CUTLER 1987, 434, assumed that the wage of the ivory-carver would not have been unaffordable, at least judging from the wages of other craftsmen listed in the price edict of 301.

<sup>149</sup> *Edictum de pretiis rerum venalium* 30.9–10 (ed. LAUFFER 1971, 191) = 28.9–10 (ed. CRAWFORD–REYNOLDS 1979, 179): De argento hoc est pusula primi pondum I (denariis) VI, Argent[ar]io artifice in operis primi in pondum I (denariis) CCC.

<sup>150</sup> Cf. CUTLER 1993, 7.

<sup>151</sup> Cf., e.g., VOLBACH 1970; VOLBACH 1977.

<sup>152</sup> Cf. CAILLET 1986; KOLLWITZ 1959, 1117–1134; DRAUSCHKE 2011b, 124, with further literature.

<sup>153</sup> ST. CLAIR 1996.

<sup>154</sup> Crypta Balbi: RICCI 2001, 336, Nos II.4.3–5.

<sup>155</sup> RODZIEWICZ 2003; RODZIEWICZ 2007, 51, 269–271, Cat. nos 659–660, 663–666; RODZIEWICZ 2009, 84–89; TÖRÖK 2005, 260–268.

<sup>156</sup> *Codex Theodosianus* 13.4.2, English translation: PHARR 1952, 390–391.



various gifts, including ivory furniture,<sup>157</sup> and the carvings that can be linked to specific cities based on their inscriptions. There were doubtless many more late antique ivory workshops than these centres, whose existence and activity cannot be demonstrated beyond any shadow of doubt.<sup>158</sup> Some of these lay in Italy, in Byzantine territory, after Justinian's *reconquista*, and thus do not challenge the availability of raw ivory in the west.

The other finds to be considered in this respect are the purse rings, ubiquitous among the grave goods of Merovingian-period burials,<sup>159</sup> which also reached the western half of the Carpathian Basin.<sup>160</sup> Their widespread use and contexts as well as this mode of the utilisation of ivory clearly reveal that even though purse rings are principally recovered from more lavishly furnished burials, they did not represent luxury articles that could solely be afforded by the upper social echelons – which, obviously, does not automatically imply that it was a quotidian object that could be easily acquired.

As we have already briefly noted in relation to the restoration of East Roman rule over Italy, it is hardly inconceivable and moreover seems quite plausible that the overwhelming majority of ivory reaching the “west” had been transported north and thence to other destinations along the Egyptian route that had played a prominent role in Roman times already before the establishment of Constantinople's direct political overlordship. Alexandria had obviously retained her role in this trade during the later centuries of Antiquity too. In addition to the role played in redistribution afforded by the city's geographic location, the workshop finds also attest to local processing and to the production of finished articles that were then traded on Mediterranean markets.

There is little direct information on the actual mechanisms of redistribution in the East Roman and Mediterranean world. What seems certain is that in the East Roman regions, the flow of raw ivory remained uninterrupted in the earlier sixth century, as shown by the high numbers of consular and other diptychs commissioned in

Constantinople during the earlier sixth century,<sup>161</sup> as well as by the fifth- and sixth-century carvings made in the workshops of the capital or in other eastern centres. The current corpus of finished ivory products and the sizes of the surviving objects offer some indication of their costs. The current evidence suggests not only that sources of raw ivory remained accessible throughout the fourth to sixth centuries, but also that the price of ivory had not changed substantially compared to what is stipulated in the price edict of 301, at least judging from the increasingly larger sizes of the diptychs during the fifth century, from the greater thickness of the late antique pieces compared to the ninth–twelfth-century Byzantine pieces, and from certain details of the employed carving techniques attesting to the more wasteful use of ivory, all points highlighted by Anthony Cutler in his study of the formal and technological traits of late antique ivory carvings.<sup>162</sup> He has convincingly argued that the price of ivory could not have been unreasonably high and thus it was not a luxury commodity affordable to a very few, at least until the mid-sixth century.

### 2.5. Decline in the volume of ivory from the later sixth century

A closer look at the chronological position of the finished products immediately reveals a major change sometime after the mid-sixth century compared to what we have seen in the above: unlike in the preceding century, ivory became a rare commodity, or at least a rarely worked one in both the Eastern Roman and the more westerly territories. Presentation diptychs, undoubtedly the “type fossils” of late antique ivory articles, are unsuitable for determining the exact date of this change because the disappearance of the pieces that can be securely dated on the testimony of their inscription around the mid-sixth century can be explained by the decline of the office of consulship.<sup>163</sup> The dating of the known pyxides and other carved ivories is far too uncertain and broad as to be suitable for constructing a finer chronology. There is a general scholarly consensus that the number of ivory carvings declined strongly in the final decades of the sixth century.<sup>164</sup> However, this chronology can only be

<sup>157</sup> In addition to various other articles, Cyril sent four ivory chairs (*chatedrae*) and two ivory stools (*scamna*) to Paul the Prefect, four ivory chairs and the same number of stools to the prefect Chryseros, two ivory chairs and two stools to Domninus the chamberlain, and two ivory chairs to Solomon, Chryseros's domestic: Cyrillus Alexandrinus, *Epistula* 96, Latin text: SCHWARTZ 1922–1923, 224–225; English translation: McENERNEY 1987, 151–153.

<sup>158</sup> Cf. CUTLER 1993, 9–13; TÖRÖK 2005, 266.

<sup>159</sup> DRAUSCHKE 2011b, 119–123, with the earlier literature.

<sup>160</sup> KONCZ–BOLLÓK in press.

<sup>161</sup> DELBRUECK 1929, 107–148, 150–154, 188–209, N9–N31, N33–34, N48–N53; VOLBACH 1970, 32–41, 45, 47–50, Nr. 8–30, 32–33, 42, 47–53; KOLLWITZ 1959, 1127–1131.

<sup>162</sup> CUTLER 1985a, 26–37.

<sup>163</sup> CAMERON–SCHAUER 1982, 137–142.

<sup>164</sup> Cf. CUTLER–NIEWÖHNER 2016.

broadly correlated with the general dating of the purse rings, a type strongly welded to ivory as a raw material in the Merovingian world, which is also known from the Carpathian Basin. Attested since the fifth century, purse rings were widely used during the sixth century, they were often deposited in burials, and on the testimony of the securely datable pieces, they retained their popularity up to the middle third of the seventh century.<sup>165</sup> This can be better reconciled with the chronological sequence in which the break in the northward trade of ivory from Aksum is dated to the early seventh century, even if based on controversial arguments.<sup>166</sup> The extinction of the North African elephant (*Loxodonta africana pharaoensis* Deraniyagala, 1948),<sup>167</sup> perhaps in consequence of the earlier over-hunting, may also have contributed to the emerging shortage of ivory, which is not negated by the handful of Byzantine ivories that can be assigned to the period between the seventh and ninth centuries on the strength of their iconography and stylistic traits.<sup>168</sup> In the lack of Byzantine ivories that can be securely dated to the earlier seventh century and given the uncertain date of the known pieces, the assumed “shortage” does not preclude that raw ivory, at least in moderate quantities, had reached Byzantine workshops. A few references in the written sources mentioning ivory carvings reaching the west from the Byzantine world in the earlier ninth century seem to suggest that the production of carved ivories merely abated, providing convincing arguments for the continuity of production in the east.<sup>169</sup> Even so, it is quite obvious that from the late sixth or the earlier seventh century onward, ivory was more scarcely available than previously in the Byzantine territories, and that this state of affairs persisted until the last decades of the ninth or the tenth century.<sup>170</sup> In the west, we witness the gradual rise of raw ivory – no matter how slight – from the final third of the eighth century. The trade routes connecting the westerly half of the European continent with North Africa were slowly revived in the last decades of the eighth

century,<sup>171</sup> explaining how ivory carvings came to occupy such a prominent position in Carolingian visual art and become one of the distinctive genres of the Carolingian *renovatio*. Yet, the amply documented recurrent recarving of late antique panels during the Carolingian period also implies that tusks were not readily available in unlimited quantities.<sup>172</sup> It would appear that although the sources of raw elephant ivory partly changed as compared to Late Antiquity, the ivory trade began to approximate the volume during the centuries of Late Antiquity around the tenth century,<sup>173</sup> providing the material basis of the high number of splendid ivory carvings produced between the mid-tenth and mid-eleventh century.<sup>174</sup>

Aside from the natural causes mentioned in the foregoing, the political changes in the Red Sea region as well as the slightly later ones in the Near Eastern and Egyptian provinces of the Eastern Roman Empire undoubtedly contributed to the decline in ivory imports to the Mediterranean in the final decades of the sixth and the early decades of the seventh century. These changes were in part precipitated by the earlier sixth-century political restructuring in the western Indian region so crucial to the Roman Indian Ocean trade, which in turn led to looser contacts with the west and a decline in the volume of trade in its wake.<sup>175</sup> On the testimony of the archaeological record, this period coincides with the establishment of livelier connections between the communities of the Swahili coast first with the Sasanians and then with the Arab world.<sup>176</sup> The shift in trade routes in the southern Red Sea region brought a major decrease in traffic: for example, ports such as Berenike, which had earlier played a key role, were abandoned in the earlier sixth century.<sup>177</sup> Aksum, which had played a prominent role in the south to north distribution of ivory arriving from the continent’s interior in

<sup>165</sup> DRAUSCHKE 2011b, 119, 122, Abb. 53.

<sup>166</sup> PHILLIPSON 2009, 358. For the weaknesses of monocausal explanations, particularly in relation to the expansion of the Arab sphere of influence as the main dynamic behind the changes in the region, cf. POWER 2012.

<sup>167</sup> ZEUNER 1963; CUTLER 1987, 442.

<sup>168</sup> CUTLER–NIEWÖHNER 2016.

<sup>169</sup> CUTLER 1994, 199–200; CUTLER–NIEWÖHNER 2016, 106, note 63.

<sup>170</sup> For the corpus of tenth–eleventh-century Byzantine carvings, cf. GOLDSCHMIDT–WEITZMANN 1930; GOLDSCHMIDT–WEITZMANN 1934 (which also includes objects made of bone). For a modern coverage, cf. CUTLER 1994.

<sup>171</sup> MCCORMICK 2001, 546–547.

<sup>172</sup> The most exhaustive corpus of these finds remains GOLDSCHMIDT 1914. Several new studies address the problem of the “court workshop” active in the court of Charlemagne (and his successors), in part in a positivist, and in part in a critical vein: FILLITZ 1999; JÜLICH 2014. Examples for the re-use of late antique ivory carvings are cited by EFFENBERGER 1999. For the route leading to Western Europe through the Arab world, cf. also GUÉRIN 2013.

<sup>173</sup> CUTLER 1985a, 31–37. See above for the western African routes (pp. 45–46, 50) and for the role of the Swahili coast in the ivory trade.

<sup>174</sup> CUTLER 2008, 37.

<sup>175</sup> POWER 2012, 198–202.

<sup>176</sup> PRADINES 2018.

<sup>177</sup> POWER 2012, 63.

Late Antiquity,<sup>178</sup> and the other Red Sea states, which had until then enjoyed immense revenues from trade, came under tremendous political pressure.<sup>179</sup> At the same time, the reorganisation of the East Roman frontier defences in the Near East and the Red Sea region under Justinian left greater room for manoeuvre for Byzantine allies, whether polities such as Aksum or local, partly Christian Arab tribes.<sup>180</sup> Contributing to the disruption of the regional balance was the active intervention of the king of Aksum – with support from Byzantium – in the southern part of the Arabian Peninsula: he occupied Himyar, whence he was ousted in the 570s by the Sasanian army, which then established its control over the routes leading east.<sup>181</sup> The military defeat and the substantial decline in the traffic along the eastern trade routes played a major role in the grave crisis that shook the Ethiopian power centre. Adding to the blow inflicted on the Eastern Roman sphere of interest, although beyond the empire's borders, was the war launched by the Sasanians against Byzantium in 602. The rapid succession of Persian victories from 610 onward saw the fall of Jerusalem in 614, of Alexandria in 618, and then of all of Egypt. And though the Persian rule lasted no more than a decade, collapsing under the successful counter-offensive of Heraclius (r. 610–641), the new conquerors, the Muslim troops arriving in the later 630s, came to stay for good. Their victories in the Near East culminated in the occupation of Alexandria in 641, which had been previously reconquered by the Byzantines in 629. Given the turbulent events of the later sixth and the earlier seventh centuries, it comes as no surprise that supplying the Mediterranean markets with ivory from either Indian or eastern African sources ran into difficulties, or that the trade system that had previously met the demands of the entire Mediterranean Basin for long centuries, even if with the occasional setback, now fell into a deep slumber for almost two hundred years. However, seeing the products of the ivory workshops active in the Muslim world during the eighth century,<sup>182</sup> it is quite obvious that Alexandria retained her earli-

er role in the processing and redistribution of ivory – the single difference was that amidst the new political conditions, the ships earlier travelling to Rome and Constantinople now had new destinations.

### 3. The value of the sixth–seventh-century ivory articles of the Carpathian Basin and the origin of their raw material

While the exact value of the ivory articles brought to light in the Carpathian Basin cannot be assessed in the lack of any factual information on the middle third of the sixth century, the sources at our disposal nevertheless provide some pointers in this respect. We can best illustrate this with the incomplete set of ten ivory gaming pieces from Grave 12 of the Mosonszentjános burial ground whose total weight is 172.6 g.<sup>183</sup> The smaller pieces have a diameter of 2 cm, the larger ones a diameter of 2.3–2.4 cm, and the clearly visible nerve channels on them indicate that they had been made from the middle or distal section of one or more tusks – in other words, the smaller utilitarian articles were cut out of sections that were less suitable for the production of wider (larger) objects such as diptychs, pyxides or furniture panels.<sup>184</sup> According to the 150 *denarii* per Roman pound specified for ivory in the price edict of 301, the total weight of 172.6 g represented a value of 80 *denarii*, which, counting with a gold coin weighing 5.5 g, came to 0.36 g of gold using the 1200 *denarii* to the *aureus* conversion and to 0.22 g of gold using the 2000 *denarii* to the *aureus* conversion. Considering the skills needed for manufacturing gaming counters, their production could hardly have taken a whole day for an *eborarius* with a well-equipped workshop and thus his wages could hardly have substantially exceeded the cost of the raw material.<sup>185</sup> The costs would have been perceptibly higher at the time of the Muziris Papyrus: counting with an *aureus* weighing 7.3 g, the raw material for the set of ten gaming counters would have cost 1.76 g of gold if using trimmed tusk and 2.47 g of gold if

<sup>178</sup> TÖRÖK 2009, 539.

<sup>179</sup> POWER 2012, 63–75, 190–198.

<sup>180</sup> POWER 2012, 66–67. For the Arab tribes allied to Byzantium, cf. SCHÖNLÉBER 2013, with the earlier literature.

<sup>181</sup> The process is briefly reviewed by POWER 2012, 61–86. For a discussion of the events set in a broader context, cf. BOWERSOCK 2012, 3–28; BOWERSOCK 2013, esp. 63–119.

<sup>182</sup> ENGEMANN 1987; HUMBERT 1987; HALDON–BRUBAKER 2001, 76–78; KESSLER 2007; RODZIEWICZ 2009, 89–91; EVANS–RATLIFF (ed.) 2012, 45–50, 177–180, 214, 221–222, Cat. nos 24, 120–121, 145, 153.

<sup>183</sup> For the finds and their measurements, cf. KONCZ–TÓTH 2016.

<sup>184</sup> Cf. VON BARGEN 1994, 51, Abb. 3, 53.

<sup>185</sup> According to the price edict of 301, the daily wage of a craftsman painting pictures was 150 *denarii*, while an artisan making wall mosaics and marble floors earned a maximum of 50 *denarii*: *Edictum de pretiis rerum venalium* VII.5–7, 9, ed. LAUFFER 1971, 118. Cf. CUTLER 1987, 450–451, on the limited time available for the creation of presentation diptychs of the highest artistic quality.

using complete tusks. Counting with the roughly 4.5 g weight of Justinian I's *solidus*, this would have meant a value of half a *solidus*, while counting with the prices of 301, the cost of the raw material would have been a negligible sum for a wealthier individual. The set undoubtedly contained more pieces and, judging from the still visible pigment patches, the counters were painted, which would have incurred additional costs. If, however, the pigments were not explicitly rare and expensive,<sup>186</sup> the value of the surviving pieces of the set could hardly have exceeded one *solidus* – it does not seem too far-fetched to reckon with this price in the middle third of the sixth century, at a time when there was still a perceptible abundance of ivory. Irrespective of whether the set of counters had been purchased or had been presented as a gift, its value lay less in the price of the raw material and the manufacturing costs than in its exotic nature, coming from a far-away region, and the game that could be played with it, even more so if the counters had come into the deceased's possession as booty from one or another campaign.

The ivory purse rings found in Langobard-period burials represented an even smaller monetary value, as did two articles from two Avar-period burials, namely a purse clasp and a spindle-whorl or a conical gaming piece.<sup>187</sup> The single exception among these finds is the pyxis from Grave II of Žuráň in the Moravian Basin, beyond the region discussed here. Although the weight of this strongly fragmented pyxis is not known, its reconstructed overall mass and its craftsmanship, the skills needed for its manufacture, eclipse by far the technical know-how needed for the production of the gaming pieces from Mosonszentjános. The one-time price of these objects,<sup>188</sup> produced in larger series, can be broadly put in the range between 5 and 15 *solidi* (although probably nearer to the former), a considerable sum compared to the annual income and living costs of peasants and workers, but hardly an outstanding expenditure for the middle classes or the more wealthy.<sup>189</sup>

Our main conclusion in our other study, namely that neither the high price of ivory, nor the drying up of the sources can, in themselves, be invoked as an explanation for the scarcity of

ivory articles in the Carpathian Basin during the sixth–seventh centuries was based on these prices and the availability of ivory in the Mediterranean in the final decades of the sixth and the early decades of the seventh century. It seems more likely that the little interest shown towards the ivory carvings from the East Roman lands or Italy should much rather be sought in the role played by ivory and certain types of the Mediterranean articles made thereof in barbarian societies. Despite their high aesthetic value, certain valuable artefact classes manufactured of ivory in the Mediterranean world such as diptychs were not particularly suited to integration into the material cultures of societies with different aesthetic values engendered by their cultural backgrounds and material needs. Moreover, elephant ivory offered less adequate means for accumulating wealth and hoarding in barbarian societies, given its low potential for recycling and for using smaller pieces of a given object if the need for a quick mobilisation of capital arose. Neither were ivory objects well-suited to being readily reworked according to the taste of local barbarian elites or for being repaired if they became damaged. Thus, it is hardly surprising that there was little receptiveness towards these foreign goods among these communities, at least judging from the grave inventories.<sup>190</sup>

The last question that remains to be briefly addressed concerns the source of the raw material used for the ivory articles found in the Carpathian Basin. On the testimony of the sources discussed in the above, we have good reason to believe that similarly to the majority of the ivories of the late antique Mediterranean world, and particularly the ones dating from the mid-sixth century when the Indian Ocean trade declined, the pieces reaching the Carpathian Basin had been manufactured from the tusks of African elephants.<sup>191</sup> However, this supposition can only be conclusively confirmed or rejected after the archaeometric analyses of the articles in question.<sup>192</sup>

<sup>190</sup> For a detailed discussion of our main insights, cf. KONCZ–BOLLÓK in press.

<sup>191</sup> Although irreproducible, the analysis of several Western European purse rings yielded similar tentative results. For a detailed discussion, cf. DRAUSCHKE 2011a; DRAUSCHKE–BANERJEE 2007.

<sup>192</sup> These analyses are currently in progress. We are grateful to our reviewers, Gergely Csiky and Péter Somogyi, for their insightful and perceptive comments and suggestions, all of which have been instrumental in a more precise formulation of certain key points. Research for the present paper was supported by the National Research, Development and Innovation Office (NKFIH) through OTKA Grant NN 113157.

<sup>186</sup> The analysis of the pigment is currently in progress.

<sup>187</sup> Cf. KONCZ–BOLLÓK in press, for a complete list.

<sup>188</sup> Cf. CUTLER 1987, 452–453.

<sup>189</sup> Based on the contemporaneous data on prices and wages collected and reviewed by MORRISSON–CHEYNET 2002.

## PRIMARY SOURCES

- AMIDON, PHILIP R. (transl.)  
2007 Philostorgius: Church History. Translated with an Introduction and Notes. Writings from the Greco-Roman World 3. Atlanta.
- BLOCKLEY, ROGER C. (ed. and transl.)  
1983 The Fragmentary Classicising Historians of the Later Roman Empire: Eunapius, Olympiodorus, Priscus and Malchus. Vol. II: Text, Translation and Historiographical Note. ARCA Classical and Medieval Texts, Papers and Monographs 10. Liverpool.
- BODENHEIMER, FRIEDRICH SIMON–RABINOWITZ, ALEXANDER (transl.)  
1949 Timotheus of Gaza on Animals. Fragments of a Byzantine Paraphrase of an Animal-Book of the 5th century A.D. Collection de travaux de l'Académie internationale d'histoire des sciences 3. Paris–Leiden.
- BRAUN, RENÉ (éd. et trad.)  
1964 Quodvultdeus: Livre des promesses et des predictions de Dieu. Introduction, texte latin, traduction et notes, tome II. Sources Chrétiennes 102. Paris.
- BRAUN, ÁDÁM–FERENCZI, ROLAND–GRÜLL TIBOR (transl.)  
2012 Expositio totius mundi et gentium: Az egész világ és a nemzetek leírása. In: GRÜLL 2012, 87–93.
- CASSON, LIONEL (ed. and trans.)  
1989 The Periplus Maris Erythraei: Text with Introduction, Translation, and Commentary. Princeton.
- CONYBEARE, FREDERICK CORNWALLIS (ed. and transl.)  
1921 Philostratus, The Life of Apollonius of Tyana. The Epistles of Apollonius and the Treatise of Eusebius in Two Volumes, Vol. II. The Loeb Classical Library 17. London–New York.
- CRAWFORD, MICHAEL H.–REYNOLDS, JOYCE M. (ed.)  
1979 The Aezani Copy of the Prices Edict. Zeitschrift für Papyrologie und Epigraphik 34, 163–210.
- CROKE, BRIAN (ed. and transl.)  
1995 The Chronicle of Marcellinus. A Translation with Commentary. Byzantina Australiensia 7. Sydney.
- DUMORTIER, JÉAN (éd. et trad.)  
1981 Jean Chrysostome: Homélie sur Ozias (In illud, Vidi Dominum). Sources Chrétiennes 277. Paris.
- FÖLDY, JÓSEF (transl.)  
1977 Strabón: Geógraphika. Budapest.
- FRESE, JOHN HENRY (transl.)  
1920 The Library of Photius. Vol. 1. Translations of Christian Literature, Ser. I: Greek Texts. London–New York.
- GULICK, CHARLES BURTON (ed. and transl.)  
1928 Athenaeus: The Deipnosophists, with an English Translation in Seven Volumes, Vol. 2: Books III106e–V. The Loeb Classical Library 208. London–New York.
- HALL, STUART GEORGE–MORIARTY, RACHEL (transl.)  
1993 Gregory, Bishop of Nyssa: Homilies on Ecclesiastes. In: Hall, Stuart George (ed.): Gregory of Nyssa: Homilies on Ecclesiastes. An English Version with Supporting Studies. Berlin–New York, 31–144.
- HAUPT, MORITZ (ed.)  
1869 Excerpta ex Timothei Gazaei Libris de Animalibus. Hermes 3, 1–30, 174.
- HEATHER, PETER–MATTHEWS, JOHN (transl.)  
1991 The Goths in the Fourth Century. Translated Texts for Historians 11. Liverpool.
- HENRY, RENÉ (éd. et trad.)  
1959 Photius: Bibliothèque, Tome 1: Codices 1–84. Paris.
- HORVÁTH, EMÓKE (intr. and transl.)  
2008 Iohannes Biclaensis krónikája. Aetas 23, 116–127.
- JEFFREYS, ELISABETH–JEFFREYS, MICHAEL–SCOTT, ROGER (transl.)  
1986 The Chronicle of John Malalas. A Translation. Byzantina Australiensia 4. Melbourne.
- JONES, HORACE LEONARD (ed. and transl.)  
1917 The Geography of Strabo in Eight Volumes, Vol. I: Books I–II. The Loeb Classical Library 49. Cambridge, Mass–London.  
1930 The Geography of Strabo in Eight Volumes, Vol. VII: Books XV–XVI. The Loeb Classical Library 241. Cambridge, Mass–London.
- KILBURN, K. (transl.)  
1959 Lucian, How to Write History. The Dipsads. Saturnalia. Herodotus or Aetion. Zeuxis or Antiochus. A Slip of the Tongue in Greeting. Apology for the “Salaried Posts in Great Houses.” Harmonides. A Conversation with Hesiod. The Scythian or The Consul. Hermotimus or Concerning the Sects. To One Who Said “You’re a Prometheus in Words.” The Ship or The Wishes. The Loeb Classical Library 430. Cambridge–London.



- KURZE, FRIEDRICH (ed.)  
1895 *Annales regni Francorum, inde ab a. 741 usque ad a. 829 : qui dicuntur Annales laurissenses maiores et Einhardi. Monumenta Germaniae Historica, Scriptores rerum Germanicarum 6.* Hannover.
- LAUFFER, SIEGFRIED (ed.)  
1971 *Diokletians Preisedikt. Texte und Kommentare 5.* Berlin.
- MAGIE, DAVID (ed. and transl.)  
1993 *The Scriptores Historiae Augustae, in Three Volumes, Vol. II. The Loeb Classical Library 140.* Cambridge, Mass.–London [6th edition].  
1998 *The Scriptores Historiae Augustae, in Three Volumes, Vol. III. The Loeb Classical Library 263.* Cambridge, Mass.–London [6th edition].
- MANGO, CYRIL–SCOTT, ROGER (transl.)  
1997 *The Chronicle of Theophanes Confessor. Byzantine and Near Eastern History AD 284–813.* Oxford.
- MCCRINDLE, JOHN WATSON (transl.)  
2010 *The Christian Topography of Cosmas, an Egyptian Monk Translated from the Greek, and Edited with Notes and Introduction. London 1897, repr.: Cambridge.*
- MCENERNEY, JOHN I. (transl.)  
1987 *St. Cyril of Alexandria: Letters 51–110. The Fathers of the Church: A New Translation 77.* Washington.
- MEZEL, BALÁZS (transl.)  
1988 *Claudius Claudianus versei. Az Ókori Irodalom Kiskönyvtára.* Budapest.
- MEZEL, MÓNKA–ADAMIK, TAMÁS (intr. and transl.)  
2010 *Tours-i Gergely: Korunk története. A frankok története.* Budapest.
- MOMMSEN, THEODOR (ed.)  
1894 *Iohannis abbatis Biclarensis Chronica. In: Th. Mommsen (ed.), Monumenta Germaniae Historica. Auctores Antiquissimi XI: Chronicum minorum saec. IV., V., VI., VII, vol. II. Berlin, 207–220.*
- OLAJOS, TERÉZIA (transl.)  
2012 *Theophülaktosz Szimokattész: Világtörténelem. Magyar Őstörténeti Könyvtár 26.* Budapest.
- PARSON, WILFRID (transl.)  
1951 *Saint Augustine: Letters, Vol. I: 1–82. The Fathers of the Church: A New Translation 12.* Washington.
- PATON, WILLIAM ROGER (ed. and transl.)  
1925 *Polybios, The Histories in 6 Volumes, Vol. IV: Book 9–15. The Loeb Classical Library 159.* London–New York.
- PHARR, CLYDE (transl.)  
1952 *The Theodosian Code and Novels and the Sirmondian Constitutions. A Translation with Commentary, Glossary, and Bibliography. The Corpus of Roman Law 1.* New York.
- PENELLA, ROBERT J. (transl.)  
2000 *The Private Orations of Themistius. The Transformation of the Classical Heritage 29.* Berkley–Los Angeles–London.
- PLATNAUER, MAURICE (ed. and transl.)  
1998 *Claudian with an English Translation, vol. II. The Loeb Classical Library 136,* Cambridge, Mass.–London [5th edition].
- RACKHAM, HENRY (ed. and transl.)  
1967 *Pliny: Natural History in Ten Volumes, Vol. III: Libri VIII–IX. The Loeb Classical Library 353.* Cambridge, Mass.–London.
- RAMSAY, GEORGE G. (ed. and transl.)  
1928 *Juvenal and Persius. The Loeb Classical Library 91.* London–New York [4th edition].
- ROUGÉ, JEAN (éd. et trad.)  
1966 *Expositio totius mundi et gentium. Introduction, texte critique, traduction, notes commentarie. Sources Chrétiennes 124.* Paris.
- SAGE, EVAN T. (ed. and transl.)  
1984 *Livy with an English Translation in Fourteen Volumes, Vol. X: Books XXXV–XXXVII. The Loeb Classical Library 301.* Cambridge–Mass–London [6th edition].
- SCHWARTZ, EDUARD (ed.)  
1922–1923 *Acta Conciliorum Oecumenicorum, Ser. IV: Concilium Universale Ephesenum, Vol. 1: Collectionis Casinensis sive Synodici a Rustico diacono composite. Berlin–Leipzig.*
- SHACKLETON BAILEY, DAVID ROY (ed. and transl.)  
1993 *Martial: Epigrams, Vol. 3. The Loeb Classical Library 480.* Cambridge, Mass.–London.
- SMITH, ROBERT PAYNE (transl.)  
1860 *The Third Part of the Ecclesiastical History of John, Bishop of Ephesus (Now First Translated from the Original Syriac).* Oxford.
- THORPE, LEWIS (transl.)  
1974 *Gregory of Tours. The History of the Franks. Penguin Classics.* London.

WHITBY, MICHAEL–WHITBY, MARY (transl.)

1986 The History of Theophylact Simocatta: An English Translation with Introduction and Notes. Oxford.

WOLF, KENNETH BAXTER (transl.)

2011 Conquerors and Chroniclers of Early Medieval Spain. Translated Texts for Historians 9. Liverpool

WOLSKA-CONUS, WANDA (éd. et trad.)

1968 Cosmas Indicopleustès: Topographie chrétienne, vol. 1: Livres I–IV. Sources Chrétiennes 141. Paris.

1973 Cosmas Indicopleustès: Topographie chrétienne, vol. 3: Livres 6–12. Index. Sources Chrétiennes 197. Paris.

WOODMAN, JESSE EARLE (ed. and transl.)

1964 The Expositio totius mundi et gentium: Its Geography and Its Language. MA Thesis: The Ohio State University. [https://www.researchgate.net/publication/293504516\\_On\\_the\\_text\\_and\\_language\\_of\\_the\\_Expositio\\_totius\\_mundi\\_et\\_gentium](https://www.researchgate.net/publication/293504516_On_the_text_and_language_of_the_Expositio_totius_mundi_et_gentium), last accessed: 13.11.2020

WRIGHT, WILMER C. (ed. and transl.)

1922 Philostratus and Eunapius: The Lives of the Sophists. The Loeb Classical Library 134. London–New York.

## SECONDARY LITERATURE

ALFÖLDI-ROSENBAUM, ELISABETH

1983 Kaiserpriester. In: Stutzinger, D. (Hrsg.): Spätantike und frühes Christentum. Ausstellung im Liebighaus Museum alter Plastik, Frankfurt am Main, 16. Dezember 1983 bis 11. März 1984. Frankfurt am Main, 34–39.

BIGWOOD, JOAN M.

2007 Aristotle and the Elephant Again. American Journal of Philology (Baltimore) 114, 537–555.

BANNIKOV, ANDREY VALERIEVICH–POPOV, ARTEM ANATOLIEVICH

2014 War Elephants of the Indian and the African Origin in the Classical Literature. Middle-East Journal of Scientific Research 21.2, 396–400.

VON BARGEN, FRIEDERIKE

1994 Zur Materialkunde und Form spätantiker Elfenbeinpyxiden. Jahrbuch für Antike und Christentum 37, 45–63.

BOLLÓK, ÁDÁM

2013 „...salva me ex ore leonis et a cornibus unicornium humilitatem meam...” (Zsolt. 21.22). A tiszabezdédi tarsolylemez ikonográfiájáról. A Nyíregyházi Jósa András Múzeum Évkönyve 55, 89–202.

2019 A bizánci diplomácia és az avar elit a 6–7. században (Byzantine Diplomacy and the Avar Elite in the Sixth–Seventh Centuries. An Essay in Interpretation). In: Balogh, Cs.–Szentpéteri, J.–Wicker, E. (szerk.): Hatalmi központok az Avar Kaganátusban. Kecskemét, 211–248.

BOMGARDNER, DAVID L.

2001 The Story of the Roman Amphitheatre. London–New York.

BOWERSOCK, GLEN W.

2012 Empires in Collision in Late Antiquity. The Menahem Stern Jerusalem Lectures. Waltham, Mass.

2013 The Throne of Adulis. Red Sea Wars on the Eve of Islam. Emblems of Antiquity. Oxford.

BOWES, KIM

2001 Ivory Lists: Consular diptychs, Christian appropriation and polemics of time in Late Antiquity. Art History 24, 338–357.

BRANDT, ADAM L.–HAGOS, YOHANNES–YACOB, YOHANNES–DAVID, VICTOR A.–GEORGIADIS, NICHOLAS J.–SHOSHANI, JEHESEKEL–ROCA, ALFRED L.

2014 The Elephants of Gash-Barka, Eritrea: Nuclear and Mitochondrial Genetic Patterns. Journal of Heredity 105.1, 82–90.

BROWN, PETER

2012 Through the Eye of a Needle. Wealth, the Fall of Rome, and the Making of Christianity in the West, 350–550 AD. Princeton–Oxford.

2018 “Charismatic” Goods: Commerce, Diplomacy, and Cultural Contacts along the Silk Road in Late Antiquity. In: di Cosmo, N.–Maas, M. (eds): Empires and Exchanges in Eurasian Late Antiquity. Rome, China, Iran, and the Steppe, ca. 250–750. Cambridge, 96–107.

BUGH, GLENN R.

2013 Hellenistic Military Developments. In: Bugh, G. R. (ed.): The Cambridge Companion to the Hellenistic World. Cambridge, 265–294.

BURSTEIN, STANLEY M.

1996 Ivory and Ptolemaic Exploration of the Red Sea. The Missing Factor. Topoi 6, 799–807.

CAILLET, JEAN-PIERRE

1986 L’origine des derniers ivoires antiques. Revue de l’Art 72, 7–15.

## CAMERON, ALAN

- 1982 A Note on Ivory Carving in Fourth Century Constantinople. *America Journal of Archaeology* 86, 126–129.
- 1984 Probus' Praetorian Games: Olympiodorus Fr.44. *Greek, Roman and Byzantine Studies* 25, 193–196.
- 2011 *The Last Pagans of Rome*. Oxford.
- 2013 The Origin, Context and Function of Consular Diptychs. *Journal of Roman Studies* 103, 174–207.
- 2015 City Personifications and Consular Diptychs. *Journal of Roman Studies* 105, 250–287.
- 2016 The Status of Serena and the Stilicho Diptych. *Journal of Roman Archaeology* 29, 509–516.
- 2017 Presentation Diptychs or Fancy Stationery? *Journal of Late Antiquity* 10, 300–324.

## CAMERON, ALAN–SCHAUER, DIANE

- 1982 The Last Consul: Basilius and His Diptych. *Journal of Roman Studies* 72, 126–145.

## CARANDINI, ANDREA–RICCI, ANDREINA–DE VOS, MARIETTE

- 1982 *Filosofiana*. The Villa of Piazza Armerina. Palermo.

## CASSON, LIONEL

- 1986 P. Vindob G 40822 and the Shipping of Goods from India. *The Bulletin of the American Society of Papyrologists* 23.3–4, 73–79.
- 1990 New Light on Maritime Loans: P. Vindob G 40822. *Zeitschrift für Papyrologie und Epigraphik* 84, 195–206.
- 1993 Ptolemy II and the Hunting of African Elephants. *Transactions of the American Philological Association* 123, 247–260.

## CHAKRAVARTI, RANABIR

- 2017 Examining the Hinterland and Foreland of the Port of Muziris in the Wider Perspective of the Subcontinent's Long-distance Networks. In: Mathew, K. S. (ed.): *Imperial Rome, Indian Ocean Regions and Muziris: New Perspectives on Maritime Trade*. London–New York, 307–338.

## COBB, MATTHEW

- 2016 The Decline of Ptolemaic Elephant Hunting: An Analysis of the Contributory Factors. *Greece&Rome* 63.2, 192–204.

## COUTU, ASHLEY N.–WHITELAW, GAVIN–LE ROUX, PETRUS–SEALY, JUDITH

- 2016 Earliest Evidence for the Ivory Trade in Southern Africa: Isotopic and ZooMS Analysis of Seventh–Tenth Century AD Ivory from KwaZulu-Natal. *African Archaeological Review* 33, 411–435.

## CUTLER, ANTHONY

- 1985a *The Craft of Ivory. Sources, Techniques, and Uses in the Mediterranean World, A.D. 200–1400*. *Dumbarton Oaks Byzantine Collection Publications* 8. Washington.
- 1985b The Elephants of the Great Palace Mosaic. In: *Bulletin de l'Association internationale pour l'étude de la mosaïque antique* 10, 125–138.
- 1987 Prolegomena to the Craft of Ivory Carving in Late Antiquity and the Early Middle Ages. In: Barral Altet, X. (éd.): *Artistes, artisans et production artistique au Moyen Âge: Colloque international*. Centre National de la Recherche Scientifique, Université de Rennes II - Haute-Bretagne, 2–6 mai 1983, vol. 2: *Commande et travail*. Paris, 431–475.
- 1993 Five Lessons in Late Roman Ivory. *Journal of Roman Archaeology* 6, 167–192.
- 1994 *The Hand of the Master. Craftsmanship, Ivory, and Society in Byzantium (9th–11th centuries)*. Princeton.
- 2008 Resemblance and Difference: Carving in Byzantium and Ottonian Germany in the Ivory Century. In: Bühl, G.–Cutler, A.–Effenberger, A. (Hrsg.): *Spätantike und byzantinische Elfenbeinbildwerke im Diskurs. Spätantike – Frühes Christentum – Byzanz, Reihe B: Studien und Perspektiven* 24. Wiesbaden.

## CUTLER, ANTHONY–NIEWÖHNER, PHILIP

- 2016 Towards a History of Byzantine Ivory Carving from the Late 6th to the late 9th Century. *Travaux et Mémoires* 20/2, 89–106.

## DAVIES, JOHN K.

- 2013 Hellenistic Economies. In: Bugh, G. R. (ed.): *The Cambridge Companion to the Hellenistic World*. Cambridge, 73–92.

## DELBRUECK, RICHARD

- 1929 *Die Consulardiptychen und verwandte Denkmäler*. *Studien zur Spätantiken Kunstgeschichte*. Berlin.

## DE ROMANIS, FEDERICO

- 2012 Playing Sudoku on the Verso of the 'Muziris Papyrus': Pepper, Malabathron and Tortoise Shell in the Cargo of the Hermapollon. *Journal of Ancient Indian History* 27, 75–101.
- 2014 Ivory from Muziris. *Institute for the Study of the Ancient World Papers* 8, 1–34.
- 2017 A Muziris Export: Schidai or Ivory Trimmings. In: Mathew, K. S. (ed.): *Imperial Rome, Indian Ocean Regions and Muziris: New Perspectives on Maritime Trade*. London–New York, 369–380.
- 2020 *The Indo-Roman Pepper Trade and the Muziris Papyrus*. Oxford.

## DRAUSCHKE, JÖRG

- 2011a Naturwissenschaftliche Analysen an elfenbeinernen Ringen des 6. und 7. Jahrhunderts aus dem östlichen Merowingerreich. In: Banerjee, A.–Eckmann, Ch. (Hrsg.): *Elfenbein und Archäologie. INCENTIVS-Tagungsbeiträge 2004–2007. RGZM Tagungen* 7. Mainz, 35–42.

- 2011b Zwischen Handel und Geschenk: Studien zur Distribution von Waren aus dem Orient, aus Byzanz und Mitteleuropa im östlichen Merowingerreich. Rahden, Westf.
- DRAUSCHKE, JÖRG-BANERJEE, ARUN  
2007 Zur Identifikation, Herkunft und Verarbeitung von Elfenbein in der Merowingerzeit. *Archäologisches Korrespondenzblatt* 37.1, 109–128.
- DUNCAN-JONES, RICHARD  
1994 *Money and Government in the Roman Empire*. Cambridge.
- EFFENBERGER, ARNE  
1999 Die Wiederverwendung römischer, spätantiker und byzantinischer Kunstwerke in der Karolingerzeit. In: Stiegemann, Ch.–Wemhoff, M. (Hrsg.): 799 – Kunst und Kultur der Karolingerzeit. Karl der Große und Papst Leo III. in Paderborn. Beiträge zum Katalog der Ausstellung, Paderborn 1999. Mainz, 643–661.
- ENGEMANN, JOSEF  
1987 Elfenbeinfunde aus Abu Mena/Ägypten. *Jahrbuch für Antike und Christentum* 30, 172–186.
- EVANS, HELEN C.–RATLIFF, BRANDIE (eds)  
2012 *Byzantium and Islam: Age of Transition*. Exhibition Catalogue. New York.
- FILLITZ, HERMAN  
1999 Die Elfenbeinarbeiten des Hofes Karls des Großen. In: Stiegemann, Ch.–Wemhoff, M. (Hrsg.): 799 – Kunst und Kultur der Karolingerzeit. Karl der Große und Papst Leo III. in Paderborn. Beiträge zum Katalog der Ausstellung, Paderborn 1999. Mainz, 610–622.
- GATIER, PIERRE-LOUIS  
1996 Des girafes pour l'empereur. *Topoi* 6, 903–941.
- GIBBS, MATTHEW  
2012 Manufacture, Trade and the Economy. In: Riggs, Ch. (ed.): *The Oxford Handbook of Roman Egypt*. Oxford, 38–55.
- GOLDSCHMIDT, ADOLF  
1914 *Die Elfenbeinskulpturen aus der Zeit der karolingischen und sächsischen Kaiser, VIII.–XI. Jahrhundert, Bd. I*. Berlin.
- GOLDSCHMIDT, ADOLF-WEITZMANN, KURT  
1930 *Die byzantinischen Elfenbeinskulpturen des X. bis XIII. Jahrhunderts, Bd. I: Kästen*. Berlin.  
1934 *Die byzantinischen Elfenbeinskulpturen des X. bis XIII. Jahrhunderts, Bd. II: Reliefs*. Berlin.
- GRÜLL, TIBOR  
2012 *Expositio totius mundi et gentium – egy késő antik gazdaságföldrajzi forrás*. *Ókor* 11.1, 85–96.
- GUÉRIN, SARAH A.  
2013 Forgotten Routes? Italy, Ifrīqiya and the Trans-Saharan Ivory Trade. *Al-Masaq* 25.1, 70–91.
- HALDON, JOHN-BRUBAKER, LESLIE  
2001 *Byzantium in the Iconoclast Era (ca. 680–850): The Sources: An Annotated Survey*. Birmingham Byzantine and Ottoman Monographs 7. Aldershot.
- HANISCH, EDWIN O. M.  
1981 Schroda: A Zhizo site in the northern Transvaal. In: Voigt, E. A. (ed.): *Guide to Archaeological Sites in the Northern and Eastern Transvaal*. Pretoria, 37–53.
- HARDT, MATTHIAS  
2017 Tiere im Gabentausch des ersten nachchristlichen Jahrtausends. In: Brieske, V.–Dickers, A.–Rind, M. M. (Hrsg.): *Tiere und Tierdarstellungen in der Archäologie. Beiträge zum Kolloquium in Gedenken an Torsten Capelle, 30.-31. Oktober 2015 in Herne*. Veröffentlichungen der Altertumskommission für Westfalen. Landschaftsverband Westfalen-Lippe 22. Münster, 315–323.
- HARRAUER, HERMANN-SIJPESTEIJN, PIETER J.  
1985 Ein neues Dokument zu Roms Indienhandel. *P. Vindob. G 40822. Anzeiger der Österreichischen Akademie der Wissenschaften, Philologisch-Historische Klasse* 122, 124–155.
- HORTON, MARK  
1987 The Swahili Corridor. *Scientific American* 257.3, 86–93.  
2018 The Swahili Corridor Revisited. *African Archaeological Review* 35.2, 342–346.
- HUMBERT, JEAN-BAPTISTE  
1987 Nr. 356. Pyxis. In: *Der Königs Weg. 9000 Jahre Kunst und Kultur in Jordanien und Palästina*. Köln, 351.
- INSOLL, TIMOTHY  
1995 A Cache of Hippopotamus Ivory at Gao, Mali; and a Hypothesis of Its Use. *Antiquity* 69/263, 327–336.
- JENNISON, GEORGE  
1937 *Animals for Show and Pleasure in Ancient Rome*. Manchester.
- JÜLICH, THEO  
2014 Fragen an die Hofschule. In: van den Brink, P.–Ayooghi, S. (Hrsg.): *Karl der Grosse – Charlemagne: Karls Kunst*. Aachen-Dresden, 57–73.

- KESSLER, HERBERT LIONEL  
2007 "Byzantine Art and the West": Forty Years after the Athens Exhibition and Dumbarton Oaks Symposium. In: Quintavalle, A. C. (a cura di): *Medioevo mediterraneo: l'Occidente, Bisanzio e l'Islam: Atti del convegno internazionale di Studi*, Parma, 21–25 settembre 2004. Milano, 57–72.
- KOLLWITZ, JOHANNES  
1959 Elfenbein. In: *Reallexikon für Antike und Christentum*, Bd. 4: Dogma II–Empore. Stuttgart 1959, 1106–1141.
- KONCZ, ISTVÁN–BOLLÓK, ÁDÁM  
in press Elephant Ivory Artefacts from the Sixth- to Seventh-Century Carpathian Basin: Chronology, Geographical Distribution, and Cultural Contacts. *Antaeus* (Budapest) 37, in press.
- KONCZ, ISTVÁN–TÓTH, ZSUZSANNA  
2016 6th century ivory game pieces from Mosonszentjános. *Dissertationes Archaeologicae* (Budapest) Ser. 3. No. 4, 161–178.
- LAW, ROBIN C. C.  
1967 The Garamantes and Trans-Saharan Enterprise in Classical Times. *The Journal of African History* 8.2, 181–200.
- LIVERANI, MARIO  
2000 Looking for the southern frontier of the Garamantes. *Sahara* 12, 31–44.
- MACKINNON, MICHAEL  
2006 Supplying Exotic Animals for the Roman Amphitheatre Games: New Reconstructions Combining Archaeological, Ancient Textual, Historical and Ethnographic Data. *Museion Ser. III*, 6, 1–25.
- MAGNAVITA, SONJA  
2009 Sahelian Crossroads: Some Aspects on the Iron Age Sites of Kissi, Burkina Faso. In: Magnavita, S.–Koté, L.–Breunig, P.–Idé, O. A. (eds): *Crossroads/Carrefour Sahel: cultural and technological developments in first millennium BC/AD–Africa: développements culturels et technologiques pendant le premier millénaire BC/AD dans l'Afrique de l'Ouest*. *Journal of African Archaeology Monograph Series* 2. Frankfurt, 79–104.  
2013 Initial Encounters: Seeking Traces of Ancient Trade Connections between West Africa and the Wider World. *Histoire et archéologie du Sahel ancien: nouveaux regards, nouveaux chantiers* 4, 1–13.
- MCCORMICK, MICHAEL  
2001 *Origins of the European Economy: Communications and Commerce, AD 300–900*. Cambridge.
- MORRISON, CÉCILE–CHEYNET, JEAN-CLAUDE  
2002 Prices and Wages in the Byzantine World. In: Laiou, A. (ed.): *The Economic History of Byzantium: From the Seventh through the Fifteenth Century*. Vol. II. *Dumbarton Oaks Studies* 39. Washington, 815–878.
- NECHAEVA, EKEATERINA  
2014 *Embassies – Negotiations – Gifts. Systems of East Roman Diplomacy in Late Antiquity*. Stuttgart.
- ONAR, VEDAT  
2013 Animal Skeletal Remains Discovered at the Metro and Marmaray Excavations. In: *Stories from the Hidden Harbor: Shipwrecks of Yenikapı*. Istanbul, 139–143.
- OPELT, ILONA  
1959 Elefant. In: *Reallexikon für Antike und Christentum*, Bd. 4: Dogma II–Empore. Stuttgart, 1001–1026.
- PHILLIPSON, DAVID W.  
2009 Aksum, the Entrepot, and Highland Ethiopia, 3rd–12th Centuries. In: Mundell Mango, M. (ed.): *Byzantine Trade, 4th–12th Centuries: The Archaeology of Local, Regional and International Exchange. Papers of the Thirty-eighth Spring Symposium of Byzantine Studies, St John's College, University of Oxford, March 2004*. *Publications of the Society for the Promotion of Byzantine Studies* 14. Farnham, 353–368.
- PLRE II  
Martindale, John Robert (ed.): *The Prosopography of the Later Roman Empire*, vol. II: AD 395–527. Cambridge.
- POSNER, HOWARD  
2015 The Value of Money: Coinage and Diocletian's Price Edict. *Journal of the Numismatic Association of Australia* 26, 1–18.
- POWER, TIMOTHY  
2012 *The Red Sea from Byzantium to the Caliphate, AD 500–1000*. Cairo–New York.
- PRADINES, STÉPHANE  
2018 Swahili Archaeology. In: Smith, C. (ed.): *Encyclopedia of Global Archaeology*. New York, NY ([https://link.springer.com/referenceworkentry/10.1007/978-1-4419-0465-2\\_565](https://link.springer.com/referenceworkentry/10.1007/978-1-4419-0465-2_565), last accessed: 06.04.2020)
- RANCE, PHILIP  
2003 Elephants in Warfare in Late Antiquity. *Acta Antiqua Academiae Scientiarum Hungaricae* (Budapest) 43, 355–384.



- RICCI, MARCO  
2001 Materie prime e materiali da riuso. In: Arena, M. S.–Delogu, P.–Paroli, L.–Ricci, M.–Sagui, L.–Vendittelli, L. (a cura di): *Roma dell'antichità al medioevo. Archeologia e storia, nel Museo Nazionale Romano Crypta Balbi*. Roma, 335–339.
- RODZIEWICZ, ELZBIETA  
2003 On Alexandrian School of Ivory Carvings in Late Antiquity. *Bulletin de la Société Archéologique d'Alexandrie* 47, 47–70.  
2007 Bone and Ivory Carvings from Alexandria. *French Excavations, 1992–2004. Études Alexandriennes* 12. Le Caire.  
2009 Ivory, bone, glass and other production at Alexandria, 5th–9th centuries. In: Mundell Mango, M. (ed.): *Byzantine Trade, 4th–12th Centuries: The Archaeology of Local, Regional and International Exchange. Papers of the Thirty-eighth Spring Symposium of Byzantine Studies, St John's College, University of Oxford, March 2004. Publications of the Society for the Promotion of Byzantine Studies* 14. Farnham, 83–95.
- VON RUMMEL, PHILIP  
2007 *Habitus barbarus. Kleidung und Repräsentation spätantiker Eliten im 4. und 5. Jahrhundert. Reallexikon der Germanischen Altertumskunde - Ergänzungsbande* 55. Berlin–New York.
- SEAYER, KIRSTEN A.  
2009 Desirable Teeth: The Medieval Trade in Arctic and African Ivory. *Journal of Global History* 4.2, 271–292.
- ŠEVČENKO, NANCY PATTERSON  
2002 Wild Animals in the Byzantine Park. In: Littlewood, A.–Maguire, H.–Wolschke-Bulmahn, J. (eds): *Byzantine Garden Culture*. Washington, 69–86.
- SCHÖNLÉBER, MÓNKA  
2013 Törzsek és umma Mohamed próféta korában. In: Kiss, A. F.–Schönléber, M. (szerk.): *Fariq. Tanulmánykötet*. Piliscsaba, 99–118.
- SIDEBOTHAM, STEVEN E.  
2017 Roman Ports on the Red Sea and their Contacts with Africa, Arabia and South Asia: Ancient, Literary and Recent Archaeological Evidence. In: Mathew, K. S. (ed.), *Imperial Rome, Indian Ocean Regions and Muziris: New Perspectives on Maritime Trade*. London–New York, 129–177.
- ST. CLAIR, ARCHER  
1996 Evidence for Late Antique Bone and Ivory Carving on the Northeast Slope of the Palatine: The Palatine East Excavation. *Dumbarton Oaks Papers* 50, 369–374.
- TARN, WILLIAM WOODTHORPE  
1928 Ptolemy II. *Journal of Egyptian Archaeology* (London) 14, 246–260.
- THÜR, GERHARD  
1987 Hypotheken-Urkunde eines Seedarlehens für eine Reise nach Muziris und Apographe für die Tetarte in Alexandria (zu P. Vindob. G. 40.822). *Tyche* 2, 229–245.
- TORP, HJALMAR–KIILERICH, BENTE  
1989 Hic est, hic Stilicho. The date and interpretation of a notable diptych. *Jahrbuch des Deutschen Archäologischen Instituts* 104, 319–371.
- TOYNBEE, JOCELYN M. C.  
1973 *Animals in Roman Life and Art*. London, repr.: South Yorkshire 2013.
- TÖRÖK, LÁSZLÓ  
2005 Transfigurations of Hellenism: Aspects of Late Antique Art in Egypt, AD 250–700. *Probleme der Ägyptologie* 23. Leiden–Boston.  
2009 Between Two Worlds. The Frontier Region Between Ancient Nubia and Egypt 3700 BC – AD 500. *Probleme der Ägyptologie* 29. Leiden–Boston.
- VISCONTI, PIETRO ERCOLE  
1874 Illustrazione d'un antico pugillare in avorio stato di uso a Gallieno Concesso senatore romano. *Bullettino della Commissione Archeologica Comunale di Roma* 2, 101–115, 147.
- VOLBACH, WOLFGANG FRITZ  
1970 *Elfenbeinarbeiten der Spätantike und des frühen Mittelalters*. Mainz.  
1977 *Avori di scuola ravennata nel V e VI secolo. Antichità – Archeologica – Storia dell'arte* 4. Ravenna.
- ZEUNER, FRIEDRICH EBERHARD  
1963 *A History of Domesticated Animals*. London.
- ZIELINSKY-KINNEY, ANGELA  
2017 From Ivory Tablets to Honeybees: Deciphering Augustine's Letter to Romanianus (Ep. 15). In: Nehring, P.–Stróżyński, M.–Toczko, R. (eds): *Scrinium Augustini. The World of Augustine's Letters: Proceedings of the International Workshop on Augustine's Correspondence, Toruń, 25–26 June 2015. Instrumenta Patristica et Mediaevalia* 76. Turnhout, 305–330.

**ELEFÁNTCSONTTÁRGYAK A 6–7. SZÁZADI KÁRPÁT-MEDENCÉBEN:  
Az elefántcsont forrása, forgalma és értéke a késő ókorban és a kora középkorban**

BOLLÓK ÁDÁM – KONCZ ISTVÁN

Tanulmányunk a hellenisztikus kor és a kora középkor közötti évszázadok mediterrán elefántcsont-kereskedelmének két fő kérdését vizsgálja: a Földközi-tenger medencéjébe eljutó elefántcsont-nyersanyag lehetséges forrásait és értékét kísérel meg felderíteni. A rendelkezésre álló írott és tárgyi források áttekintése alapján az elefánt-agyar származási helyeként a hellenisztikus kor, az ókor utolsó és a kora középkor első évszázadai között egyaránt számba vehető Északnyugat- és Kelet-Afrika, valamint az indiai szubkontinens. A 6. és a 7. században, amikor a Kárpát-medencei langobárd és kora avar kori régészeti emlékekből eddig megismert néhány elefántcsont-faragvány (játékkorongok, tarsolygyűrűk, egy tarsolyzáró és egy pyxis) keltezhető, az elefántcsont legvalószínűbben afrikai, azon belül is kelet-afrikai forrásokból juthatott el a Földközi-tenger medencéjének piacaira, ahonnan már megmunkált formában, importtárgyként kerülhettek a Közép-Duna-medencébe. A kelet-afrikai, Vörös-tengert érintő útvonalakon folyó elefántcsont-kereskedelem fontosságát és jellegét az írott források több helyen részletezik, ám pontos kiterjedését és működését az újabb régészeti adatoknak, elsősorban kelet- és dél-afrikai feltárásoknak köszönhetően kezdjük megismerni. Az indiai forrásokat ebben az időben természetesen nem lehet kizárni, de a rendelkezésünkre álló adatok alapján ezek szerepe kisebb lehetett. A történeti és régészeti adatok alapján megrajzolt kép pontosítását, illetve megerősítését vagy esetleges helyesbítését elsősorban a folyamatban lévő, valamint a jövőben megvalósuló természetudományos vizsgálatoktól várhatjuk.

Írásunk másik fele az ókori árviszonyok alakulását vizsgálja. A hellenisztikus korból, a Kr. u. 2. század közepére keltezhető Muziris Papiruszról és a 301-es híres ármaximáló rendeletből ismert ár adatok, valamint a késő ókori elefántcsont-faragványok alapján kikövetkeztethető értékviszonyok alapján a tanulmány arra a következtetésre jut, hogy a Kr. u. első évezred első felében, s különösen is a késő ókor évszázadai folyamán, egészen a 6. század utolsó harmadáig, a 7. század első évtizedeiig

az elefántcsont viszonylag széles körben elérhető és korántsem megfizethetetlen árú luxuscikk volt. Különösen feltűnő ez az alacsony ár a Diocletianus-kori árrendelet idején, amely a 150 évvel korábbi állapotnál is sokkal alacsonyabb árakat rögzít. A késő ókori faragványok mérete, nagy száma és megmunkálási technikájuk alapján úgy tűnik, az utóbbi viszonyok fennmaradhattak a későbbi évszázadok során is, ha konkrét monetáris érték nem is rendelhető a nyersanyaghoz, és így érdemes nagyon óvatosan eljárni az 5–7. századi árviszonyok becslése során.

A Kárpát-medencéből ismert 6–7. századi tárgyak méret- és súlyadatai, továbbá kidolgozásuk munkaigénye alapján úgy tűnik, hogy a Földközi-tenger medencéjének piacain e tárgyak egyenkénti (a mosonszentjánosi játékkorongkészlet esetében pedig a szett) ára nem haladhatta meg jelentősen a fél-egy solidusnyi értéket. Kivételt csak a vitatott keltezésű, a Kárpát-medencétől északnyugatra, a Morva-medencében előkerült zurányi pyxis jelent, de annak ára sem haladhatta meg jelentősen a néhány solidusos értéket (tág határok között 5 és 15 solidus közé becsülve az árat). Látna tehát, hogy az elefántcsont mint nyersanyag a gepida és a langobárd korban a mediterrán világ piacain bőséggel rendelkezésre állt, ritkává válása pedig a kora avar korra, annak is inkább a második felére, végére tehető, nem tűnik valószínűnek, hogy az elefántcsont tárgyaknak a gepida, a langobárd és a kora avar kori régészeti hagyatékból megfigyelhető ritkasága a nyersanyag eleve elérhetetlen vagy kiemelkedően drága voltával lenne magyarázható. Szerepet játszhatott mellőzöttségükben, hogy ellentétben a nemesfémekkel, szükség esetén az értékük nem volt könnyen mobilizálható, sem nyersanyaguk nem volt minden további nélkül újrahasznosítható. Sokkal inkább azonban magának az elefántcsontnak, az abból készült mediterrán eredetű tárgytípusok nagy részének a barbár társadalmakban betöltött szerepében, vagy éppen annak hiányában kereshetjük az okát, hogy e közösségek tagjai körében nem mutatkozott jelentős érdeklődés irántuk.