Mediterranean Historical Review

ISSN: 0951-8967 (Print) 1743-940X (Online) Journal homepage: www.tandfonline.com/journals/fmhr20

Tangible evolutional dynamics of silkworm's introduction in Europe

Panagiota Fragkou, Claudio Zanier & Skarlatos G. Dedos

To cite this article: Panagiota Fragkou, Claudio Zanier & Skarlatos G. Dedos (2025) Tangible evolutional dynamics of silkworm's introduction in Europe, Mediterranean Historical Review, 40:2, 141-190, DOI: 10.1080/09518967.2025.2569187

To link to this article: https://doi.org/10.1080/09518967.2025.2569187

Published online: 22 Dec 2025.

Mediterranean Historical Review, 2025
Vol. 40, No. 2, 141–190, https://doi.org/10.1080/09518967.2025.2569187

Tangible evolutional dynamics of silkworm's introduction in Europe

Panagiota Fragkou [a], Claudio Zanier[b] and Skarlatos G. Dedos [a]

[a]*Department of Biology, National and Kapodistrian University of Athens, Athens, Greece;* [b]*Department of Civilisations and Forms of Knowledge, University of Pisa, Pisa, Italy*

This article critically examines the early evolutional dynamics of the European silk road by inquiring into the points of entry, distribution routes, and evolution of the agricultural activity of silkworm rearing and the production of silk in Europe in the Middle Ages. Historical texts and manuscripts were examined revealing that silkworm rearing in Europe can be initially traced to around 960 in Córdoba, Spain. Subsequently, this agricultural activity is reported in Avellino, Italy, in 1037, and later in Nafpaktos, Greece, in 1217/18. Silkworm rearing for raw silk production is much later identified as present in northern Italy when the first artistic depiction of the silkworm's life cycle appears in a 1427 illustration. The historical texts provide no credible evidence to support the notion that silkworm rearing existed in the early and middle Byzantine Empire, while textual evidence leads us to the conclusion that silkworm rearing was introduced in southern Spain by Arab populations from Syria, and by the eleventh century the production of raw silk was known throughout the Mediterranean Sea.

Keywords: *Bombyx mori*; silkworm; silk; Calendar of Córdoba; Geniza; *Book of the Prefect*; Silk Road

Ludovico Antonio Muratori (1672–1750): "in qual tempo vi passasse l'arte della seta, niun monumento gli è caduto sotto gli occhi, che ce ne avvisi."

Introduction

The historical expansion of the Silk Road to Europe has been extensively narrated and depicted in myriads of research papers and books in sharp contrast to the scarcity of publications on the agricultural activity of silkworm rearing and silk reeling, and the introduction, spread, and distribution of the silkworm, *Bombyx mori*, in Europe. The evolutional dynamics of the European silkworm races after their introduction into Europe have been perfunctory and fragmentally documented in a diverse array of archival texts and manuscripts that do not piece together a coherent narrative. The expansion of silkworm rearing in Europe is a matter of debate between Byzantinists who propose that silkworm rearing in Europe originated in the Byzantine Empire,[1] and those who advocate a diverse and discontinuous introduction of the silkworm, *Bombyx mori*, in

Corresponding author. Email: sdedos@biol.uoa.gr

Europe,[2] while both parties do not seem to grasp the full scale of technical requirements and physiological and ecological adaptations by the animal that are fundamental in ensuring a sustainable and constant production of raw silk.[3]

Silk, be it a yarn or a garment, can be transported in great distances and survive for centuries.[4] The silkworm and/or its cocoon need human care and can only be transported at its egg stage.[5] The silkworm was and still is a fully domesticated animal, entirely dependent on humans for its survival in every step of its life cycle.[6] Under favourable environmental conditions, its life cycle is completed in 50–60 days, and consists of the egg state, the feeding larval stage, the pupal stage that takes place within the cocoon, and the adult stage in which the moth emerges from the cocoon to copulate, lay eggs and die without feeding.[7] The silkworm's eggs need protection from adverse environmental conditions, in the larval stage the animals do not actively search for food (mulberry leaves) and rely on humans for their feeding. In the adult stage the moths do not fly and need, occasionally, human assistance to copulate and lay eggs that can be harvested. All these facts make the silkworm a fully domesticated animal entirely dependent on humans for its survival.[8]

Recent studies revealed that the silkworm descended from the wild silkworm, *Bombyx mandarina*, of northern China.[9] Humans spread its rearing throughout history to various countries and states resulting in distinct ecological adaptations that are now being recognized as four distinct clans of silkworm races: the Tropical races, the Chinese races, the Japanese races, and the European races. The pedigree of these races has been recently resolved through genetic studies, and now we know that the silkworm has evolved from Chinese trimoulters (i.e., races with 3 instead of 4 larval ecdyses) that were native of northern China.[10] Such genetic studies may be quite recent but they put into question the frequent conflation between silk and the silkworm in scientific literature, historical texts, mass media, and cultural heritage interpretations.[11] This conflation indicates a frivolous insight to the biological aspects of silkworm rearing and raw silk production to such extent that, in certain cases, the interpretation of historical texts and scripts leads to all kinds of overt exaggerations.[12] More often than not, the practice of silkworm rearing in Europe is conflated with the practice of raw silk processing or silk textile weaving[13] to such incredulous assumptions that at certain instance have been documented to be wrong.[14] A clear distinction needs to be made between the documented presence of the silkworm, *Bombyx mori*, at a location or historical moment, the concept of sericulture as a holistic agricultural activity that has emerged in the nineteenth century, and the presence of silk as an imported or exported commodity in the form of yarn or textile, three distinct tangible elements that may overlap but do not necessarily coincide.

Here we attempt to undo this conflation by showing that several technical and physiological aspects of silkworm rearing and raw silk production have been misconceived in the relevant scientific literature, thus creating a construed understanding of the introduction of the silkworm and its use for raw silk production in Europe. We posit that the introduction of the silkworm in Europe was a gradual process that was successful after several failed attempts, and required the presence or evolution of specific physiological traits by the animal such as the one life cycle per year (univoltine) trait.

The silkworm, *Bombyx mori*, in European Antiquity

The first mention of a silk spinning insect within Europe comes from a short passage from Aristotle (384–322 BCE) in his book *Historia Animalium*.[15] Aristotle talks about the women of Kos who make garments of silk by reeling the cocoons of an insect, a description that has been the point of reference to the presence of the silkworm, *Bombyx mori*, in Greece since Antiquity. However, the text does not infer the silkworm but rather a moth named, *Pachypasa otus*, which is native of the Greek islands and spins a white cocoon that can still be found on birch trees in the Greek islands of southeast Aegean.[16] This species is alleged[17] and evidently[18] suggested as the source of Coan silk (as it is casually called) spun from its cocoon. Aristotle states that the animal's life cycle is completed in six months, an allusion to *Pachypasa otus* which overwinters in the stage of caterpillar. There are no archaeological artefacts of such silk apart from a mineralized white cocoon found in Akrotiri, in Santorini,[19] the discovery of which is until today the most ancient archaeological evidence that ancient civilizations in Europe knew about cocoons made by insects, although the origin of the specimen is unknown and may not actually belong to *Pachypasa otus*.

Pausanias (110–180 CE) was the first to mention the people who were producing silk in his writings.[20] Pausanias provides an intriguing passage which may indicate that he describes an insect other than the silkworm that is reared throughout the year. His narrative about Σῆρες[21] has been perpetuated and reproduced by many Byzantine historians[22] and lexicographers[23] even up to the tenth century, and has been the subject of much debate about the land these people might have lived.[24]

Although traces of silk fabrics or silk thread have been found in ancient Egypt,[25] certain grave sites throughout Europe[26] and several other archaeological sites,[27] there are no actual descriptions of the presence of the silkworm in Europe in Antiquity. On the contrary, the recent identification of the second-century Palmyra silks[28] as belonging to silk from the silkworm, *Antheraea mylitta*, a native species of India,[29] may have to force scholars to interpret the narrative of Pausanias[30] in a completely different way.

Despite the fact that the silkworm may have been unknown to Europeans in Antiquity, the mulberry tree is reported to have been already present at least in Greece since Theophrastos (371–287 BCE) describes black and white mulberry fruits as present in Greece.[31] There is also a similar description of the origin of mulberries with white fruits in a text dated back to the third to second century BCE,[32] and mulberries with white fruits are described in detail in the only surviving Byzantine book about agricultural production (10th cent.)[33] which makes no mention of the silkworm *Bombyx mori*. Therefore, the host plant of the silkworm, being anemophilous and a preferred food for birds, predates in its arrival in Europe the arrival of the silkworm by more than one millennium, at the very least.

Bombyx mori in Byzantine literature

A popular belief, is that the *Bombyx mori* silkworm was first introduced in Europe in the Byzantine Empire during the reign of the Byzantine Emperor Justinian I (527–565). The testimony for this comes from Procopius of Caesarea (500–565) in his book *History of the Wars*.[34] The text states that monks from India met Justinian I in 546 and then the

monks appear to have brought silkworm eggs to Constantinople in spring of 547, because the text then mentions Ἰσδιγούσναϛ (Izadgushasp), a Persian envoy sent to Constantinople in 547 by Khosrow I.[35] The narrative only provides the name Serinda (*Σηρίνδα)* as the land where the silkworm eggs came from. We can deduce that the narrative concerns the silkworm *Bombyx mori*, because the larvae were fed with mulberry leaves[36]; however, the eggs were incubated covered by dung, a practice never occurring later in any other historical text.

The other account comes from the Byzantine Archbishop Photios I (810–892)[37] who narrates in his book Myriobiblon[38] what he read in a book from Theophanes the Byzantine (6th cent.). The books of Theophanes the Byzantine have been lost, and we only have the account by Photios I of the one in question. Here the account is different and events taking place after the battle of Bukhara in 560[39] are described. The text states the name of Emperor Justin II (565–578), and this suggests that it refers to a second incident/attempt to introduce silkworms into the Byzantine Empire. The text also describes the First Turkic Khaganate and its relations with the Byzantine Empire, through events that took place after 565.[40] The narrative states that Emperor Justin II showed the silkworms to the Turks, and they were "impressed", a rather dubious fact given that the Turks by then governed most of the lands of Central Asia where silkworm rearing may have already been taking place.[41] If silkworms were present and had been reared in Byzantium since 547, why would they be re-introduced in Byzantium twenty years later? Moreover, if silkworms were reared by the Byzantines and silk was produced locally, why would not Photios I mention this in the *Lexicon* that he published in the ninth century, in which he refers to Seres (*Σῆρες)* as a nation where silk is made?[42] In addition, Suda, a Lexicon of the tenth century has an entry for silk and the place where it is made, marking pointedly that it is not produced in the Byzantine Empire.[43] Given that by 565 the Byzantine Empire occupied Syria, the narrative suggests that by that time silkworm rearing was not practised in Syria, but in lands further east.

These two incidences describe above, one dated to the sixth century and the other narrated in the ninth – despite their similarities, and irrespective of whether they have been conflated in popular culture – probably represent two out of several other unreported attempts that were made[44] to introduce the animal to a new environment, without understanding the full spectrum of provisions, adaptations and physiological requirements needed for the silkworm to complete its life cycle and be bred annually. While the mulberry tree is reported by many scholars of the Byzantine Empire since the early Middle Ages,[45] for example by Theophylactus of Ochrid (1055–1107),[46] silkworm rearing is not mentioned at all in a tenth-century Byzantine book that describes the husbandry of several domestic animals, including bees.[47] Regarding the source of silk, Byzantine scholars repeatedly, and most of the times reproducibly, refer to the land of Seres (*Σῆρες)* as the source of silk in scripts that date up to the eleventh century. The narrative of Archbishop Eustathius of Thessaloniki (ca. 1115–ca. 1195/6)[48] is the first one to mention that Iberia produced silk, and that merchants from Carthage were involved in silk trade; this detail is reported again by Ioannis Tzetzes (1110–1180).[49] However, despite all these narratives there exists no single mention of the source of silk from within the Byzantine Empire which can only lead us to propose, together with the other evidence mentioned above, that until the early thirteenth century there was no

documented silkworm rearing carried out within the Byzantine Empire, and not even a mention of the silk being sourced from southern Italy is made, which during the eleventh century was part of the Byzantine Empire.[50] It is only in the early fifteenth century that the narrative of Georgios Gemistos (1355–1452) provides a distinction between the Seres (*Σῆρες)* and China (*Σῖναι)*, stating that the former lived northern and the latter southern to each other.[51] However, he is not the first one to mention the word *Σῖναι* as a people's name.[52]

The first most detailed description of the silkworm in the Byzantine Empire comes from the narrative of Michael of Ephesus (1050–1120).[53] This is the earliest description of the life cycle of *Bombyx mori* in Europe, and it is given in such detail that one understands that the silk moth had no ability to fly, had one life cycle per year (i.e., was univoltine) and the women were incubating the eggs in their bosom,[54] a practice also described in one of the two poems written by the Byzantine poet Manuel Philae (Μανυήλ Φυλής; ca. 1275–1345) dated to 1300.[55] These two poems are the first dedicated to the silkworm in European literature. However, the narratives by Michael of Ephesus and Manuel Philae do not specify the location in which silkworms existed, and as such may be a narrative provided by a third party.

The *Book of the Prefect*[56] provides the rules and regulations governing the various guilds[57] that operated in the Byzantine Empire in the early tenth century and it is pivotal in our understanding of how silk was merchandised in the Byzantine Empire and silk garments came to be instruments of diplomacy by the Byzantines. Since its discovery, this book has been the source of various speculations on the presence of silkworm rearing in Byzantine Empire in the ninth and tenth century.[58] Its discovery and publication in 1893 seems to have bolstered the notion of the Silk Road as conceptualized by Ferdinand von Richthofen in 1877, and in the twentieth century reached legendary proportions in both the literature[59] and popular culture. The *Book of the Prefect* clearly states that raw silk is imported from Syria and that ready-made silk garments are also imported from Syria, but the latter are traded by a distinct guild.[60] No mention is made of any other geographical location, apart from Syria, but the members of the guild of Othonoprates (*Οθωνοπράτες*) who traded in linen textiles, were able to source their merchandise from several places, including a region west of Constantinople (*Στρυμῶνος*). If we are to believe that silkworm rearing was established in the Byzantine Empire by the sixth century, why is there no mention of the source of the raw silk from areas near Constantinople, or, as in the case of the *Οθωνοπράτες*, west of Constantinople? In addition, there is no concrete evidence in the *Book of the Prefect* and not even a hint that cocoons were traded by the guilds, nor is there mention of cocoons anywhere in the text.

The first evidence of the rearing of the silkworm in Greece comes from a letter written by the Archbishop of Nafpaktos, Ioannis Apokaukos (ca. 1155–1233), dated to 1217/1218, which describes the loss of the silkworms and their rearing huts by a pirate raid.[61] This reference to silkworm rearing in Nafpaktos comes at a time when the Latin Empire replace the rule of the Byzantine Empire in 1204.

The reference to silkworm rearing in Nafpaktos in 1217/18 should not be confused with the proposed extensive silk-weaving activities that were reportedly taking place in

Thebes in the twelfth century, and which is reported by Nicetas Choniatis who relates that Roger II of Sicily raided in 1147 Corinth and Thebes, taking captive the Theban weavers.[62] The narrated text, however, does not provide any evidence that there was silkworm rearing taking place in Thebes at the time (1147). It simply states that some of the women taken captive were skilled at weaving.[63] The text does not even specify what kind of weaving was involved. That silk weaving was indeed taking place in Thebes at the time is confirmed by Benjamin of Tudela, who visited the city around 1161 and describes silk-weaving activity by Jewish people there and in Thessaloniki,[64] crafts-people who were, notably, barred from the silk guilds in Constantinople in the early tenth century, but he makes no mention of where raw silk comes from. Benjamin of Tudela makes no reference to the raid of Thebes by the Normans about fourteen years earlier. Mention is made of silk weaving in Thebes in 1195 by Nicetas Choniatis during the reign of Alexios III Angelos (1195–1203).[65]

In summary, until the early thirteenth century there exists no concrete and undisputed evidence that silkworm rearing and silkworms were present in territories occupied by the Byzantine Empire. Silk was a very important material for the Byzantines, but it could be sourced from abroad, and the descriptions in the *Book of the Prefect* indicate that silkworm rearing was already taking place in Syria by the ninth century. As early as the twelfth century Byzantines knew of the life cycle of the silkworm, and by the early thirteenth the silkworm was reared in Greece in at least one place (Nafpaktos). Silkworm rearing was most probably introduced in the Byzantine Empire from southern Italy at a time when raw silk could also be sourced from Syria or other areas in the Middle East.

Silkworms in Europe in the Middle Ages

The first mention of silkworm rearing in Europe, dated back to around 960, appears in the Calendar of Córdoba and describes the various activities throughout the year that are undertaken for the rearing of the silkworms and the reeling of silk.[66] The Calendar of Córdoba states that in al-Andalus in February women begin to incubate the silkworm eggs until they hatch in March. Entries for May relate facts about silk dyeing, and others indicate that provisions were made for silk dyeing in August. These descriptions indicate that there was a single rearing cycle per year, confirming that the silkworm race(s) in al-Andalus were univoltine, though the text does not provide any indication about the handling of the eggs that were produced for the next year's crop. From the text we can understand that the rearing of the silkworms was probably lasting about fifty to sixty days, a very long period for twenty-first-century practices, but a realistic period given that in Chios in 1786 silkworm rearing lasted fifty days.[67]

Another mention of silkworm rearing in al-Andalus comes from the early twelfth century, thanks to a *fatwa* issued in Córdoba by Aṣbagh b. Muḥammad (d. 1111)[68] that describes an agreement required for the rearing of silkworms between two parties/individuals. There are several other passages in various other *fatwas* from the tenth to fourteenth century[69] providing information about mulberry trees and silk weaving in al-Andalus, indirectly confirming that silkworm rearing was sustainably and continuously taking place in the region from the mid-tenth century or earlier, at least as described in the Calendar of Córdoba, a detail further testified by al-'Udhrī (1003–1085),[70] al Bakrī

(1040–1094),[71] and al-Idrīsī (ca. 1100–1165).[72] The latter for example writes of the city of Jaen in al-Andalus as a place in which its residents reared silkworms, without referencing any weaving practices, which were in all likelihood running parallel.

For his part, the said Al Bakrī informs us that in al-Andalus silkworm rearing and the cultivation of mulberry trees were established in the sheltered parts of the Sierra Nevada valleys, where Syrian tribes had settled during the Caliphate of the eighth century.[73] However, a direct link between specific Syrian settlers and silkworm rearing in al-Andalus has not been documented so far, although it is suggested by other authors.[74] This is due to the successive migrations of Arab populations that were taking place in Maghreb and al-Andalus from the eighth to the thirteenth centuries. Thus, one can not clearly establish with certainty when Syrian settlers brought silkworm rearing to al-Andalus.

Regarding the various silkworm races that the farmers were rearing in al-Andalus, the only indirect account occurs in a *fatwa* by Abū Isḥāq Al-Shaṭibī (d. 1388), in which the cocoons are referred to as "almonds of silk" (*lawz al-ḥarīr*),[75] and this may be an indication of their colour (brownish) and their shape as ellipsoid, widely different from the cocoons we know today. Another interesting fact dated to the sixteenth century, after the Castilian conquest in al-Andalus, is the imposition of mass white mulberry tree (*Morus alba*) cultivation that was met with opposition by the local silkworm farmers in the former Kingdom of Granada because their silkworms were fed with the leaves of the black mulberry tree (*Morus nigra*) and produced a silk thread of higher quality.[76] This again stands in sharp contrast to our modern practice, whereby the black mulberry tree is side-lined and not considered a nutritious food source for the silkworms, another misconception of the many that plagued the historical evolution of silkworm rearing in Europe.

Upon the Castilian conquest of al-Andalus, the historical evidence shows that silkworm rearing was already practiced in areas occupied by the Christians.[77] One of the poems (Cantiga 18) attributed to King Alfonso X el Sabio (1221–1284) and composed around 1260, details the creation of two silk veils by silkworms belonging to a woman from Segovia.[78] Such narratives show that silkworm rearing had spread by 1260 to northern areas of Spain.

The fact that in al-Andalus silkworm rearing was sustainably and continuously taking place from the middle of the tenth century is further supported by the evidence provided by al-Idrīsī (d. 1165), which show that silk weaving and the production of various silk garments with distinct names were common in al-Andalus, and the trade between Spain and northern Italy intensified from the fourteenth century[79] after the Castilian conquest, when northern Italy was already expanding its silk-trade network.[80]

The Geniza scripts provide several instances of the trade of raw silk and silk textiles reaching Fustat (Egypt) from Spain, or (passing through) Sicily, from the tenth to twelfth centuries. With two possible exceptions, the Geniza scripts do not mention Byzantine silk, which was prohibited from being traded outside the Byzantine Empire. The only documented citing of Byzantine textile are from 1060 and 1157 amongst the Geniza scripts, though textiles were exported to Fustat still in the thirteenth century, given that the Geniza scripts contain documents dating up until 1250.[81] The eleventh-century geographer Al Bakrī states that Gabès was the only place in Tunisia where mulberry

trees grew, and where silkworms were reared for silk production.[82] However, silkworm rearing was apparently practised in Tunisia as early as 996, since a *fatwa* by Ibn Abi Zayd (d. 996) describes the settlement of a sale of mulberry leaves for rearing silkworms in Kairouan.[83]

The transfer of silkworm rearing to the south of the Italian peninsula appears to have occurred from the Arab-Muslim world, either directly from Tunisia or through the intermediary Sicily. The first mention of silkworm rearing in Italy comes from a narrative dated to 1037 from the San Modesto monastery near Avellino, in Italy which describes an agreement between the monastery that owns mulberry plantations and the farmers who will give half of their product (raw silk fibres) to the monastery.[84] Another report of silkworm rearing in southern Italy comes from a parchment scroll in Calabria dating to 1050 and found in the register of the Archbishop of Reggio.[85]

Despite these documented evidence of silkworm rearing in southern Italy in the eleventh century, there exist no tangible and direct evidence to show that silkworms were reared in Sicily at the same time.[86] The raid of Thebes by the army of Roger II in 1147 represents a pivotal event that has become a fallacious argument for the notion that silkworm rearing was transferred from the Byzantine Thebes to Sicily, and therefore that the European silk routes originated from the Byzantine Empire and reached Sicily in the twelfth century.[87] F. Chalandon[88] discredited this argument by providing the narratives of Hugo Falcando (d. ca. 1200)[89] who describes the Norman Kingdom of Sicily from 1154–1169 and a Spanish Arab traveller Ibn Jubayr (1145–1217)[90] who recounts that, during his stay in Palermo, he visited the weaving workshops. H. Falcando confirms the testimony of the Arab traveller, but neither make any mention of silkworm rearing and there is no mention of the practice in Sicily at all during the reign of the Norman kings. Since southern Italy was home to several Muslim communities that had emigrated there in the previous centuries, it is an open question whether silkworm rearing was actually transferred from Tunisia to southern Italy in the early eleventh century.

The discovery of the polyptych from Santa Giulia di Brescia (Lombardy), dated to the ninth/tenth century, introduced much debate as to whether silkworm rearing was also present in northern Italy at the time, but such speculations have been conclusively dismissed by P. Toubert,[91] in line with evidence which shows that, just as in the Byzantine Empire, the presence of raw silk trade does not equate to the presence of the silkworm in a region.

From its origins in 1037 in Avellino, silkworm rearing and the manufacturing of silk textiles were pursued in the thirteenth and fourteenth centuries in Calabria and other areas of the Italian peninsula,[92] with silk guilds established in the late thirteenth century in towns such as Catanzaro and Lucca, and silkworm rearing continued to spread further north.[93] For example, women in Bologna are reported to collect leaves for silkworms in 1304,[94] while a statute issued in 1350 in Trieste prohibited silk reelers from boiling cocoons within the city walls, owing to the stench of the process.[95]

G. Yver provides information on silk trade active in Italy in the fourteenth century, probably involving the various silk guilds that were established in various Italian cities; while Ludovico Lazzarelli (1447–1500) provides a phrase in his poem, *Bombyx*, that is indicative of raw silk coming from Spain to Italy even in the late fifteenth century.[96]

Figure 1. Detail of a 1427 image of the Statutes of the Silk Workers' Guild in Bologna, Italy. The image is a detail that appears in the lower left and lower right corner of a much larger image. It depicts 3 Bombyx mori silkmoths and their eggs, a bolus of wrapped white silk, and six white Bombyx mori cocoons. It dates back to 1427 and decorates the front page of the Statutes of the Silk Workers' Guild that existed at that time (founded in 1217) in Bologna, so this first illustration may actually be from 1217. These statutes, as a document, survive in the Municipal Library of Bologna. Note the ellipsoid almond-shape of the cocoons that is uncharacteristic of modern-day European silkwormraces, and the colouration of the cocoons that is used to indicate their volume. The unidentified author of the image had obviously witnessed the life cycle of the silkworm first-hand.

Figure 2. Depiction of documented geographical sites in Europe, Africa, and the Middle East, where silkworm rearing and silk production were practised until the first decades of the sixteenth century. Red signs indicate the documented sites where rearing or trade is reported in Africa and the Middle East during the ninth and tenth centuries. Black arrows indicate the probable migration route of Arab migrants to southern Spain. Orange diamonds indicate the documented sites of silk processing in Italy and the Byzantine Empire. Green signs indicate the geographical sites of the first documented presence of the silkworm in the Middle Ages in Spain, Italy, Greece, and France. Blue signs indicate the geographical sites of subsequent documented spreading of silkworm rearing. White arrows indicate the putative (marked by: ?) routes of introduction of silkworm races from one area to another in Europe. The inset image presents the most commonly used route of the Silk Road from China to the Middle East, as evidenced by research carried out by one of the co-authors (Claudio Zanier). The purple points indicate various cities in the Silk Road whose names are omitted for clarity. The images were created using the ArcGIS software (ESRI, USA) with further annotation on the software-generated map.

Elsewhere, Z. Betti reports that by 1428 silkworm rearing was common in Verona,[97] a further indication that such practices were extensive by the early fifteenth century in northern Italy. Betti also informs us that by the fifteenth century both trimoulter and tetramoulter silkworm races were present in Italy, and mentions several authors from the fifteenth century onwards who witnessed either or both of these races.[98] Such descriptions show that at least as early as the fifteenth century successive introductions of silkworm races had transpired, at least in Italy, thus forming the clan of European silkworm races which in later centuries came to be identified as a genetically distinct family of silkworm races. The timing is in line with recent evidence which shows that the genetic diversity of the silkworm expanded rapidly during the Song Dynasty (960–1279) in China.[99]

Marco Girolamo Vida (1485–1566), the author of the *De Bombyce*, and L. Lazzarelli provide in late fifteenth- and early sixteenth-century poetic narratives of the silkworm *Bombyx mori* that are quite informative. According to Betti, M. G. Vida describes the presence of trimoulter silkworms in Italy.[100] Another poem, titled "*Bombyx*" and composed probably around 1485 by Lazzarelli, describes several varieties of silkworms, indicating that races with several morphological variations already existed in Italy by the end of the fifteenth century.[101]

An illustration of the silkworm life cycle discovered by Prof. C. Poni[102] – and dated back to 1427 – is the first illustration of the silkworm in Europe (see Figure 1). This magnificent and well-preserved etching is a detail of a larger illustration and depicts (in duplicate) the entire life cycle of the animal, showing white silk tied to a bolus (probably Mazzami, as the silk spun from cocoons at homes in Italy was called) and white cocoons.

Venetian conquests in the eastern Mediterranean seem to have played an important role in the spreading of silkworm rearing in areas of Greece, as noted in 1494 by Pietro Casola (1427–1507), a Venetian who travelled to Corfu, Methone, and Rhodes; his account states that in all three places, silk production was present.[103] In the town of Methone he also reports Jewish people working on silk weaving. The first two of the places he visited were under Venetian rule in 1494, and all three places were not under Ottoman rule (see Figure 2).

A report dated 1809 on the introduction of the mulberry tree to France provides an interesting account of when silkworm rearing was first established in that country.[104] The author relates how silkworm rearing was introduced by gentlemen from Dauphiné in the Rhône region, who had followed Charles VIII (1483–1498) on the expedition to Naples in 1494 (see Figure 2). The same author also describes the establishment of silk factories by Louis XI (1461–1483) in Touraine, under the direction of Guillaume de Briçonnet, which were supplied only with foreign silks. However, according to Betti, Louis XI had planted mulberry trees in Touraine for silkworm rearing by 1466.[105] De Quatrefages in 1860 informs us that in early sixteenth century the numerous plantations in the Orléanais, the Bourbonnais, and the parliament of Toulouse established a sort of mulberry nursery, so the centre of France seems to have taken the lead over the Rhône region (see Figure 2).[106]

Therefore, the beginning of the sixteenth century marks the further expansion of silkworm rearing from Italy to France. Although Spain was known to export silkworm eggs to other countries,[107] there is no documented evidence that silkworm rearing

practices spread from Spain to France, though there is plenty of documented proof that silkworm rearing practices spread to France from Italy.

None of the historical texts that describe silkworm farming during the Middle Ages in Europe provide any quantitative information about the scale of this activity. It is only in the early nineteenth century that detailed technical reports on quantitative aspects of the practice gradually appear. However, historians have tried to approximate the extent of activity during the Middle Ages. For example, A. Guillou[108] attempted to calculate the quantities of raw silk production in Calabria in 1050 based on a parchment scroll found in the private archives of the counts of Calabria that belonged to the register of Archbishop of Reggio, as described above. The scroll is a record of taxes on mulberry trees that belonged to a Byzantine monastery under the jurisdiction of the metropolis of Reggio. The scroll describes the presence of 6,425 mature mulberry trees in the area and another fifth of them being young trees not subjected to taxation. The document offers the only extant record concerning the cultivation of mulberry trees in the Byzantine Empire that at the time occupied southern Italy, forming the Catepanate of Italy.

Some authors consider Guillou's calculations erroneous,[109] while D. Jacoby[110] attempts his own estimation of Guillou's data. Although contentious, accepting Guillou's claim that the presence of mulberry trees indicate the presence of silkworm farming in the area of Reggio, in Table 1 we present the data from Guillou, the estimates of Jacoby, alongside comparative assessments of data presented by J. Guichard, who describes in great detail the activity of silkworm rearing in Chios, Greece, and Syria in 1786[111]; these sources are accompanied by our calculations based on the limited data presented by Betti for silk production in Verona in 1756.[112] Guillou is correct in stating that a mulberry tree can produce up to 300 kg of leaves because a similar quantity per tree is reported for Chios by J. Guichard in 1786. Guichard provides extensive and impressively exact details of silkworm and cocoon farming, and silk production, in Chios (then part of the Ottoman Empire), and in Syria (most probably in the coastal areas). He refers to data collected around 1766–1770. Our calculations (Table 1) confirm the accuracy of Guichard's data about the life cycle of the silkworm and the production of cocoons. Most importantly, Guichard personally reared silkworms and produced cocoons to obtain first-hand experience of the tasks involved. Moreover, he describes the mulberry trees as producing a yield of 290 kg of fresh leaves annually, a number very close to that suggested by Guillou (Table 1). However, such trees must have been considerable in size, definitely never pruned, and over fifty years old at least to achieve such a yield. Guillou correctly calculates that owing to their enormous size, their land allocation is 26.4 trees per hectare. Moreover, the leaves of such trees were picked by hand – as reported for Chios in 1786[113] and al-Andalus in the *fatwa* issued by Aṣbagh b. Muḥammad (d. 1111), who mentions ropes, hooks, and ladders for leaf picking.[114] Guillon's miscalculations (or typographical errors) begin when he states that a tree could yield 25 kg of raw silk annually, meaning that by his reckoning the 6,425 trees produced 160,625 kg of raw silk per annum.[115] This, however, is an exaggeratedly high amount (Table 1). As suggested by A. Muthesius,[116] even a hundredth of this should be considered with extreme caution, considering that back in the eleventh century silkworms were still highly unproductive, until later advances in modern science in both the rearing practices and in silk reeling, along with mulberry cultivation. In fact, J. Guichard

Table 1. Productivity parameters of silkworm rearing in Middle Ages in Europe as calculated from the data presented by A. Guillou (1974), D. Jacoby (1992), J. Guichard (1786) and Z. Betti (1756).

Productivity Parameters	A. Guillou 1050	D. Jacoby 1050	J. Guichard 1786	Z. Betti 1756
1. Quantity of Eggs (g)	25	25	25	25
2. Quantity of silkworm larvae per 25 g of eggs	32,500	32,500	32,500	32,500
3. Amount of leaves produced by a mulberry tree (kg)	300	300	290	300
4. Amount of leaves consumed/25 g of eggs-larvae (kg)	720	720	720	720
5. Total fresh cocoon weight produced/tree (kg)	309	25.4	19.0*	19.0
6. Total dry cocoon weight produced/tree	102	8.5	6.3	6.3
7. Average cocoon weight (g)	22.8	1.88	1.88	1.24
8. Average silk thread length (metres)	290	290	290	290
9. Raw silk yield (kg)/tree	25	2.3	1.0	0.9
10. Raw silk yield (kg)/25 g of eggs	60	5.5	2.5	2.1
11. Raw silk percentage (%)	8.1	9.0	8.0	6.6**
12. Number of trees per hectare	26.4	26.4	26.4	26.4
13. Area (hectares)	1700	1700	1700	1700
14. Raw silk yield per total area (6425 trees) (kg)	160,625	14,778	6425	5533
15. Reelability (%)	24.5	27.2	15.8	13.6
16. Denier	57.3	5.3	4.7	2.6

The reader is referred to Supplementary File 1 (DOI:10.6084/m9.figshare.27986255) where the exact calculations are shown and explanations on the values are presented. The Denier size calculated from the data of Z. Betti matches present-day values, an indication that the data of Z. Betti is very accurate. The modern-day average commercial weight of a *Bombyx mori* fresh cocoon is 1.5–2 g.
*The data is adjusted for 25.1% mortality of larvae during rearing, an adjustment not done by A. Guillou (1974) or D. Jacoby (1992). **This number derives from sericulture productivity statistics of the 19th century presented by L. Clugnet (1877).

calculates that back then a mulberry tree would have produced annually about 1 kg of raw silk,[117] hence the 6,425 specimens would provide a total 6,425 kg of silk, more or less. For his part, Betti states in the eighteenth century that – according to the old rule of thumb – 1,000 cocoons would produce 1 oz (approx. 28 g) of raw silk,[118] and most probably that yield was 6.6% or less, given the yield reported for the nineteenth century by L. Clugnet[119] relative to several European countries. Both Guillou and Jacoby appear to disregard other productivity indexes of silkworm rearing (Table 1), and their conclusions must surely be much lower, considering the technological advances made in the eleventh century, a fact that seems to have escaped the notice of both writers, who assert that production in the eleventh century almost matched that of the twentieth.[120]

Conclusions

Until the end of the Middle Ages, the immense complexity of essential processes pertinent to silkworm rearing involved the extremely laborious task of leaf picking by hand from vast mulberry trees, to feed silkworms whose productivity was inefficient to say the least. Owing to their geographical isolation, these silkworms evolved into races that had a single

life cycle per year, and remained at the larval stage for 50 to 60 days, and furthermore most probably necessitated 36,590 cocoons to produce a mere 1 kg of raw silk (Table 1; Supplementary File 1). This estimate is derived from the data reported by Betti, who in the eighteenth century affirms that, according to the old rule of thumb, 1,000 cocoons (1.24 g fresh weight each: Table 1) produce 1 oz (approx. 28 g) of raw silk. This scant yield was compounded by the requirement to preserve the silkworm eggs over winter in mountains or in areas of steady low temperatures to ensure a successful yearly crop. Under such requirements it is unimaginable that silkworm rearing was introduced "overnight" into Europe, and probably took repeated efforts over time that were sustained only by the immense prestige of the final raw silk product.

While such devoted efforts took place in the Byzantine Empire, most likely they were eventually successful in al-Andalus (Figure 2) only through human migration, and not due to imports or introductions of silkworms at the egg stage of their development by persons with no experience of handling the complex life cycle of the animal. The Calendar of Córdoba (10th cent.) is a testament to this conclusion, and though probably silkworms rearing was already practised earlier in al-Andalus, the only evidence we have on this is the ninth-century narrative of the geographer al-'Udhrī (1003–1085), who provides only one figure of quantity of silk from the ninth century, with no further mention of silkworms or cocoons.[121]

In chronological order, the second narrative on the presence of the silkworm dates to 1037 in Avellino; but in this case it is unclear how and who introduced the silkworm in southern Italy (Figure 2). Whether the Aghlabids of Ifrīqiya (modern-day Tunisia) were the ones who, upon their conquest of Sicily in the ninth century, transferred the practice first to Sicily and henceforth to southern Italy, or directly to the mainland, is an issue that can not be resolved from the evidence. Although the former path seems more probable, there is no documentation supporting that claim that silkworm rearing was practised in Sicily before 1037. Nor is there any evidence of the transfer of silkworm rearing from al-Andalus to Sicily or southern Italy, although the trade of silk between those two regions was vigorous.[122]

According to Z. Betti, trade of silkworm eggs between Spain and northern Italy was common by the fifteenth century, but there is nothing to support the claim that silkworm rearing was transferred to France from Spain via land routes, at least until the late fifteenth century. Spain and Italy appear therefore as the two dominant regions from where silkworm rearing spread to other areas of the Mediterranean Sea, with Italy playing a pivotal role in introducing the practice in regions of Greece annexed by the Republics of Venice and Genoa from the declining Byzantine Empire, and hence the reported presence of silkworm rearing in Nafpaktos in 1217/18.

Acknowledgements

The authors wish to thank Dr Ioanna Tripoula for providing the translations from the Classic Greek texts and Mr Sotirios A. Mloukie for providing the translations from the Arabic texts. We also wish to thank Dr Adela Fábregas García, Facultad de Filosofía y Letras, Campus Universitario Cartuja, Spain, for invaluable assistance with certain literary sources.

Notes

1. Guillou, "Production and Profits"; Muthesius, "The Byzantine silk industry."
2. Goitein, Sanders and Grunebaum, "Silk in western Byzantium," in *A Mediterranean Society.* Vol. I; Jacoby.
3. Zanier, *Miti e culti*; Zanier, "Silk Cultivatiom (sic)"; Zanier, "The migration."
4. Good, "Archaeological Textiles"; Good, "The Archaeology of Early Silk"; Jørgensen, "The question of prehistoric silks."
5. There exists no archival text or script that explicitly describes the transport of silkworm cocoons over great distances, an extremely bulky and delicate item that can be damaged easily during transport.
6. Tazima, *The Silkworm*, vii.
7. Ibid., 32.
8. Ibid., 25–26.
9. Lu et al. "FibH Gene," 1–2.
10. Ibid.
11. Boak, *The Book of the Prefect*; Guillou, "Production and Profits"; Lopez, "Silk Industry"; Maniatis, "Organization"; Mavridis and Vatalis, "Products and Markets"; Muthesius, "The Byzantine silk industry"; Muthesius, *Studies in Byzantine*; Muthesius, "Essential processes"; Simon, "Die Byzantinischen Seidenzunft"; Wu, "Reconstructing the Byzantine sericulture" and Wu, "Mapping Byzantine Sericulture."
12. Boak, *The Book of the Prefect*; Guillou, "Production and Profits"; Laiou and Bouras, *The Economic History of Byzantium*; Muthesius, "From Seed to Samite"; and Wu, "Reconstructing the Byzantine sericulture."
13. Mavridis and Vatalis, "Products and Markets"; Muthesius, *Studies in Byzantine*; Wu, "Reconstructing the Byzantine sericulture."
14. Jacoby, "Silk in western Byzantium," 476, n. 130.
15. Forbes, "The Silkworm of Aristotle," 22; see text in Appendix Segment 1.
16. Parenzan and Percelli, "Notes on the biology."
17. See note 15 above.
18. Parenzan and Percelli, "Notes on the biology"; Demaison, *Recherches*.
19. Panagiotakopulu et al, "A lepidopterous cocoon from Thera."
20. Spiro, *Pausaniae Graeciae descriptio*, 167; see text in Appendix Segment 2.
21. Yates, *Textrinum Antiquorum*, 222; see text in Appendix Segment 3.
22. Giet, *Basile de Césarée*, 472; See text in Appendix Segment 4; Berghoff, *Palladius. De gentibus Indiae*, 2; See text in Appendix Segment 5; Wünsch, *Ioannis Laurentii Lydi*, 11; see text in Appendix Segment 6; Westermann, *Stephani Byzantii Ethnicon*, 250; see text in Appendix Segment 7, and Moravcsik and Jenkins *Constantine Porphyrogenitus*, 52; see text in Appendix Segment 8.
23. Adler, *Suidae lexicon*, 352; Bekker, *Suidae lexicon ex recogn*, 948; Schmidt, *Hesychii Alexandrini lexicon*, 1347, and von Pauly, *Paulys Real-Encyclopädie*, 577; see text in Appendix Segment 9.
24. Chin, "The Invention"; von Richthofen, *China: Ergebnisse eigener Reisen.*
25. Lubec et al. "Use of silk."
26. See note 4 above.
27. Good, "On the question of silk."
28. Pfister, *Textiles de Palmyre*, 55.
29. Lee et al, "Species identification of silks."
30. The description by Pausanias suggests that he refers to an insect that is different from the silkworm or, less likely, he describes polyvoltine silkworms which are clearly distinct from the univoltine European silkworm races. See text in Appendix Segment 2.
31. Wimmer, *Theophrasti Eresii Opera*, 95, 213; see text in Appendix Segment 10.
32. Nauck, *Tragicorum Graecorum fragmenta*, 38; Herbst, *Galeni Pergameni de Atticissantium*, 51; see text in Appendix Segment 11.
33. Bassus, Geoponica *sive* De re rustica, 307, 313; see text in Appendix Segment 12.

34. Maltretus, *Procopius (of Caesarea.)*, 547; see text in Appendix Segment 13.
35. Dodgeon and Lieu, *The Roman Eastern Frontier*, 111.
36. In the original text the phrase is: *συκαμίνου φύλλοις* which translates to mulberry leaves. *Συκαμινιά* is the classic Greek word for mulberry.
37. Porson, *Photii Lexicon e codice Galea*.
38. Dindorf, *Historici Graeci minores*, 447; see text in Appendix Segment 14.
39. Frye, *The History of Ancient Iran*, 411; Rezakhani, *ReOrienting the Sasanians*, 141.
40. Qiang and Kordosis, "The Geopolitics on the Silk Road," 19.
41. Chin, "The Invention"; Zanier, "The Silk Cycle in China."
42. Porson, *Photii Lexicon e codice Galeano*, 440; see text in Appendix Segment 3.
43. Bekker, *Suidae lexicon ex recogn*, 948; see text in Appendix Segment 15.
44. Zanier, "The Silk Cycle in China," 18.
45. See note 33 above.
46. Migne, *Patrologiae cursus completus*, 985; see text in Appendix Segment 16.
47. See text in Appendix Segment 11. This narrative on grafting combinations of the mulberry tree and other trees appears also in one of the first agronomical texts known in al-Andalus, written by Abū l-Khayr al-Ishbīlī (1040–1095) in the 11th century, who explains that "The fig tree is grafted onto the mulberry [...] but the mulberry, when grafted onto the fig tree, transforms its flavour and silk worms do not eat it," in what appears to be a duplication of the 10th-century Greek text. For the Spanish reference to Abū l-Khayr al-Ishbīlī (1040–1095), see https://www.mapa.gob.es/es/agricultura/temas/medios-de-produccion/red-red-red_al_andalus_vol_2_tcm30-644312.pdf. The difference in the two narratives lies in the mention of the silkworm by Abū l-Khayr, and the complete absence of any mention of the silkworm in the Byzantine text.
48. Müller, *Geographi Graeci minores*, 348; see text in Appendix Segment 17.
49. Tzetzes, *Ioannis Tzetzae Historiarum*, 433; see text in Appendix Segment 18.
50. Guillou, "Production and Profits," 96.
51. Diller, *Studies in Greek Manuscript Tradition*, 375; see text in Appendix Segment 19. Starting from the 2nd century and the Greek geographer Claudius Ptolemy (100–170) (see text in Appendix Segment 20), the word *Σῖναι* as a people's name is distinguished from the land *Σηρικῆ*, that was later attributed as the land where silk came from. The same distinction is adopted in the works of the 6th century scholar Stephen of Byzantium (see text in Appendix Segment 21), the Arab Christian polymath, John of Damascus (675/676–749) (see text in Appendix Segment 22) and by Georgios Gemistos (ca. 1355/1360–1452/1454).
52. Stückelberger and Grasshoff, *Klaudios Ptolemaios*, b. 7, c. 3; See text in Appendix Segment 20; Westermann, *Stephani Byzantii Ethnicon*, 253; see text in Appendix Segment 21, and Kotter, *Die Schriften des Johannes*, 70; see text in Appendix Segment 22.
53. Hayduck, *Ioannis Philoponi (Michaelis Ephesii)*, 154. See text in Appendix Segment 23. Recent evidence, see Arabatzis, "Michael of Ephesus"; and Ierodiakonou, "Michael of Ephesus," revealed that this text was wrongly attributed to Ioannis Philoponi, a 5th-century scholar from Alexandria.
54. The practice of silkworm egg incubation by placing the eggs in a pouch in a woman's bosom has a very long history of occurrence in various texts and narratives. It is a practice that was necessitated by the absence of any heating devices that would keep a constant temperature that was still used until the beginning of the 20th century. Silkworm eggs require a constant temperature of incubation for their successful hatching that does not have to be equal to a human's body temperature. The required temperature of incubation of silkworm eggs is 25°C and this temperature ensures that all the larvae that will hatch will have one life cycle per year. Eggs of bivoltine races, that is races that exhibit two life cycles per year, if incubated at 25°C will have one life cycle per year while if they are incubated in less than 20°C, they will exhibit two life cycles per year. We cannot know if the silkworm races that were initially used in Europe were univoltine (i.e., had one life cycle per year) or bivoltine. However, we do know that by this method of incubation all silkworm eggs will have one life cycle per year even if they were from bivoltine races. We also know that the

present-day European silkworm races are all univoltine. We do not yet know whether the univoltine character has been an adaptation of the early European silkworm races once they appeared in Europe or a character that already existed in the silkworms that were introduced in Europe. There are several narratives about this practice and narratives also state that people were placing the pouch of the silkworm eggs under their pillow during their sleep to keep the silkworm eggs warm. Both the univoltine and the bivoltine characters necessitates that silkworm eggs must be maintained during winter at very low temperatures for them to hatch in spring, a physiological requirement which mandates that silkworm eggs were sourced from areas with high mountains or constantly low winter temperatures, while other provisions such as preservation in deep wells are described in the 19th century. The silkworm eggs of the univoltine or bivoltine character enter diapause for several months but once they come out of diapause they can hatch at a time when no mulberry leaves are available for them to feed. This necessitates that eggs are maintained in low temperature to prevent embryonic development once the diapause stage ends.

55. Dübner and Lehrs, *Manuelis Philae versus iambici*, 65–67; see text in Appendix Segment 24.
56. Boak, *The Book of the Prefect*; Kollias, *The Book of the Prefect*; Nicole, *Le livre du Préfet*.
57. Mommsen, *Corpus juris civilis*, 798; see text in Appendix Segment 25; Migne, *Patrologiae cursus completus*, 227; see text in Appendix Segment 26; Doukas, *Istoria turco-bizantină*, 340; see text in Appendix Segment 27; Christophorides, *Isidore Glava, Archbishop*, homily 4; see text in Appendix Segment 28; Constantin VII, "*Constantin VII Porphyrogénète*," 9; see text in Appendix Segment 29, and von Lingenthal, *Jus Graeco-Romanum*, 243; see text in Appendix Segment 30.
58. Lopez, "Silk Industry"; Muthesius, "The Byzantine silk industry"; Oikonomidès, "Silk Trade."
59. Chin, "The Invention"; James and Steger, "A Genealogy of 'Globalization'."
60. Kollias, *The Book of the Prefect*, 93–152. The *Book of the Prefect* (or *Book of the Eparch*) is a very well-known extant document from the 10th century that is believed to have been published after the death of Emperor Leo the Wise between 912 and 920. The document lists five guilds associated with silk. These are the Βεστιοπράτες (4. Περὶ τῶν βεστιοπρατῶν), the Πρανδιοπράτες (5. Περὶ τῶν πρανδιοπρατῶν), the Μεταξοπτάτες (6. Περὶ τῶν μεταξοπρατῶν), the Καταρτάριοι (7. Περὶ καταρταρίων), the Σηρικάριοι (8. Περὶ σηρικαρίων). In the description of the roles and professional practices that members of these guilds are supposed to abide by, there is no mention of the silkworm or cocoons, but instead it repeats references to raw silk. Moreover, in the description of the following guild, the Οθωνοπράτες (9. Περὶ τῶν ὀθωνιοπρατῶν ἤτοι μιθανέων), there is a specific reference to the source of flax as coming from three different geographical locations within the Byzantine Empire. In contrast, for the source of imported raw silk there is no mention of a specific location west of Syria and this comes at a time when Syria was not under the rule of the Byzantine Empire. Of note is the use in the text of the word *ἐσθήματα* and the word *χαρέρια*, the first describing probably dyed silk garments and the latter describing other plain silk garments. Although this distinction puts into question whether silk dyeing was carried out at the time in Constantinople, this distinction of the garments deserves a much thorough interpretation.

    From the text analysis by Kollias we can conclude that Βεστιοπράτες were merchants of ready-made silk garments that were made within the Byzantine Empire, the Πρανδιοπράτες were merchants of ready-made silk garments that were not made within the Byzantine Empire but were made in Syria and the members of this guild are prohibited to trade garments made within the Byzantine Empire.

    Μεταξοπτάτες were merchants of raw silk who were prohibited to process and could only sell it to Σηρικάριοι and to Καταρτάριοι, a profession described for those individuals who were buying raw silk from Μεταξοπτράτες, they were then processing the raw silk and

then they were selling it to Σηρικάριοι. Of note is the use of the proverb (Των) for the guilds that were merchants and the absence of the proverb for the other two guilds.

The *Book of the Prefect* describes that Βεστιοπράτες are buying fabrics from Σηρικοπράτες, persons that do not seem to belong to any guild and it is an open question what is the nature of this profession.

According to text analysis by Kollias, the Σηρικάριοι were involved in the preparation of silk garments from raw silk they were buying from the Καταρτάριοι, but it is not entirely clear if they were also carrying out the dyeing of garments.

The *Book of the Prefect* describes two more professions, the Μελαθράριοι who could not buy raw silk and the Μεταξάριοι who could buy raw silk only from Μεταξοπράτες.

According to text analysis by Kollias, and as suggested by other authors, the words Μελαθράριοι and Μεταξάριοι may indicate the same profession being a paraphrase of one to the other or that Μελαθράριοι were persons not processing pure raw silk but rather dyed or otherwise processed silk. The word Μεταξάριοι is not new, first appearing from the 5th to 6th century as a word associated with Κομμερκιαρίοι, who were customs officers in the Byzantine Empire, indicated by at least two narratives (see text in Appendix Segment 25 and Segment 26). Both of these suggest that the word Μεταξάριοι probably refers to merchants that did not belong to a guild by the 10th century in the Byzantine Empire and who, according to the *Book of the Prefect*, could only buy silk from Μεταξοπράτες.

The *Book* does not offer any clear indication of what the job description of the members of each of these guilds was. However, the various names of the guilds can be easily explained from the descriptions of the activities of these guilds by other contemporary authors. For Βεστιοπράτες, for example, there exist three narratives that allude to the activities of this guild (see text in Appendix Segment 27–29). It is worth noting that the name *βεστιοπρατήριον* in Appendix Segment 27 may not give away the profession but the Persian word *πεζεστάνιον* clearly indicates that a textile shop is described. These three narratives suggest that the Βεστιοπράτες composed a guild of highly trained professionals who were preparing clothes and garments. Overall, according to these three narratives and the descriptions in the *Book of the Prefect*, the Βεστιοπράτες appear to be individuals that belonged to a guild whose members were merchants and makers of silk clothing, in the sense that they were producing the final garments they were trading.

When it comes to other two guilds that are mentioned in the *Book of the Prefect* – the Πρανδιοπράτες and Μεταξοπράτες – the nature of their profession is even clearer thanks to references from other authors. The *Book* specifically states that Πρανδιοπράτες traded ready-made silk textiles from Syria; while the Μεταξοπράτες traded textiles made in the Byzantine Empire itself, and were not allowed to travel to buy silk. The narrative in Appendix Segment 30 suggests that the Πρανδιοπράτες and Μεταξοπράτες belong to guilds whose members did not work with their hands, an indication that the guilds were composed of persons working solely as traders and merchants, and not actively engaged with the raw silk they were trading.

What could be the actual work of the Καταρτάριοι, Σηρικάριοι, and Μελαθράριοι? A. Muthesius (1995) suggests that silk degumming was carried out as mentioned in the *Book of the Prefect* by Σηρικάριοι, a suggestion also proposed by D. Simon (1975). But this suggestion should be rejected as impossible since the *Book* makes no mention of what the processing of raw silk involved, and silk degumming is only mentioned explicitly as a process in the 19th century in France. Moreover, silk degumming is not taking place during raw silk reeling since only 3,5% of sericin is removed during cocoon reeling, while the remaining sericin requires a special treatment to be removed. In the same way as the misinterpreted assertions of R. Lopez (1945), these suggestions put forth by Muthesius (1993), who interprets the *Book of the Prefect* as a testament of the presence of sericulture in Byzantium, can only be regarded as totally out of context. For example, Muthesius writes that “A unique pre-World War II yellow silk cocoon and a hank of yellow (gummed) raw silk was given to the author in 1991 by D. Sakelaridis, the last remaining handwoven silk

manufacturer of Soufli" in an apparent misconception of what was taking place in the Middle Ages and the 20th century.

To summarize, we suggest that the first three guilds – the Βεστιοπράτες, the Πρανδιοπράτες and the Μεταξοπτάτες – were purely merchants, as also suggested by other authors who analysed the *Book of the Prefect*, that were not processing the silk, while the other two professions (guilds) – the Καταρτάριοι and the Σηρικάριοι – were involved in processing the raw silk. In addition, it seems that there is no reason to assert that members of some of these guilds were involved in raw silk degumming, raw silk weaving or raw silk dyeing as has been suggested by other authors.

61. Pétridès, "Jean Apokaukos, Lettres," Epistle 21; Bees, "Unedierte Schriftstücke," 149; see text in Appendix Segments 31–32. Ioannis Apokaukos refers to silkworms as *μεταξογεννήτορες σκώληκες* which translates to silk-bearing worms and speaks of the huts that house them.
62. Bekker, *Historia*, 99; see text in Appendix Segment 33. Nicetas Choniatis mentions that according to the agreement of 1158 between William I of Sicily and Manuel I, only the aristocratic and military captives were released, and "those whose lot it was to weave the finely woven linen cloths, and the beautiful and low-girdled women who had practised this craft together with the men" were kept in Sicily. In the same paragraph N. Choniates claims that the next generation of weavers from Corinth and Thebes followed their parents and migrated to Sicily.
63. Nicetas Choniatis mentions nothing about silk when describing the raid of Thebes, simply states that the captive women were well-versed in the art of weaving (Classic Greek text: "*τὴν ἱστουργικὴν κομψότητα καλῶς ἐπιστάμεναι"*). He does not specify silk weaving. That silk weaving was taking place in Thebes in the 12th century is corroborated by the narrative of Nicetas Choniatis, who describes that in 1195 the sultan from Iconio Muhyi al-Din demanded as ransom for the peace negotiations with Alexios III Angelos (1195–1203) that a yearly donation of silk garments be given to him from those made in Thebes.
64. Adler, *The Itinerary of Benjamin of Tudela*, 10–11; see text in Appendix Segment 34.
65. Unger, *Commentationes de Thebarum Boeticarum*, 201; see text in Appendix Segment 35.
66. Dozy, *Le calendrier de Cordoue*, 33, 41, 58, 84; see text in Appendix Segment 36. The reader is informed that the text of the Calendar of Córdoba in Arabic is now available online (see https://www.filaha.org/ArabicTranslation.html) and in its English translation https://www.filaha.org/calendar_of_cordoba_english_translation_revised%20_arib.html.
67. Guichard, *L'art de faire éclorre*, 38.
68. Lagardère, "Mûrier et culture," 102–3; see text in Appendix Segment 37.
69. Al-Wansharīsī *Al-Mi'yar al-mu'rib*; see Lagardère, "Mûrier et culture," 101, 111: according to Lagardère (1990), Aḥmad b. Yaḥyā al-Wansharīsī (ca. 1430–1508) compiled several *fatwas* which show that silkworm rearing was continuously present in al-Andalus from its first mention in the Calendar of Córdoba around 960 all through the following centuries.
70. Sánchez Martínez, "La cora de Ilbira," 24.
71. Al-Bakrī, *Geografía de España*, 23–24.
72. Al-Idrīsī, *Description de l'Afrique*, 209.
73. Lafuente y Alcántara, *Ajbar Machmuâ*.
74. Lopez-Marigorta, "How al-Andalus wrapped itself," 4; Lagardère, "Mûrier et culture," 97; Lombard, *Les textiles*, 95 and García, *Flora agrícola*, 321.
75. Lagardère, "Mûrier et culture," 102.
76. López de Coca Castañer, "'Morus nigra' vs 'Morus alba'," 183–99; Jacoby, "The production," 169, n. 12.
77. Garrad, "La industria sedera," 77.
78. Chatham, *A Palaeographic Edition*, 30; see text in Appendix Segment 38.
79. Fábregas, "La seda en el reino"; Fábregas, "Aprovisionamiento de la seda."
80. Zanier, "Silk Cultivatiom (sic)"; Zanier, "The migration."
81. Goitein, *A Mediterranean Society*, Vol. I, 102–3.
82. Al-Bakrī, *Description*, 44–45; see text in Appendix Segment 39.

83. Lagardère, "Mûrier et culture," 101–4.
84. Bartoloni, "*Le piu antiche carte*" 17–21; see text in Appendix Segment 40.
85. Guillou, "Production," 93.
86. Jacoby, "Silk and Silk Textiles," 464–65.
87. Houben, *Roger II of Sicily*, 84.
88. Chalandon, *Histoire de la domination*, 764; see text in Appendix Segment 41.
89. Falcando, *The History of the Tyrants*, 259.
90. Ibn Jubayr, *The Travels of Ibn Jubayr*, 340.
91. Toubert, "Un mythe historiographique," 215–26.
92. Zanier, "Silk Cultivatiom (sic)," 41.
93. Yver, *Le commerce*, 92–93.
94. de Crescentiis, *Libro dell'Agricoltura*, 239.
95. de Szombathely, *Statuti di Trieste del, 1350*, 270.
96. Lazzarelli, "Ludovici Lazzarelli Septempedani," 186; see text in Appendix Segment 42.
97. Betti, *Del baco da seta*, 171; see text in Appendix Segment 43.
98. Ibid., 174; see text in Appendix Segment 44. Betti is probably the first author to report that the trimoulter trait in the silkworm is dominant over the tetramoulter trait, a finding that has been verified by several other authors in the 20th century, and this observation shows that at least as early as the 15th century successive introductions of silkworm races was already taking place at least in Italy, thus forming the clade of European silkworm races that in later centuries came to be identified as a genetically distinct clade of silkworm races.
99. Sun et al. "Phylogeny and evolutionary history."
100. Vida, *Marci Hieronymi Vidae*; see text in Appendix Segment 44.
101. Lazzarelli, "Ludovici Lazzarelli Septempedani," 186; see text in Appendix Segment 45.
102. Poni et al. "La seta in Italia," 310.
103. Casola and Newett, Casola Canon Pietro Casola's Pilgrimage, 187, 192, 208.
104. Vincens-Saint-Laurent, "Recherches"; (see http://www.nemausensis.com/Nimes/OrigineSoieNimes.html).
105. Betti, *Del baco da seta*, 25.
106. de Quatrefages, *Essai sur l'histoire de la sériciculture*, 21–22.
107. Betti, *Del baco da seta*, 165.
108. Guillou, "Production," 94.
109. Harvey, *Economic Expansion*, 149–150; Muthesius, "From Seed to Samite," 143–44.
110. Jacoby, "Silk in western Byzantium," 475–76.
111. Guichard, *L'art de faire éclorre*, 1–96.
112. Betti, *Del baco da seta*, 166.
113. Guichard, *L'art de faire éclorre*, 84–85.
114. Al-Wansharisi, *Al-Mi'yar al-mu'rib*, Vol. VI, 178.
115. See note 108 above.
116. Muthesius, "From Seed to Samite," 143–44.
117. Guichard, *L'art de faire éclorre*, 67; see text in Appendix Segment 46: Guichard calculates from four different silkworm farmers in Chios in 1770, that: 1) 1 tree gave 1.348 kilograms of silk, 2) 1 tree gave 0.93 kilograms of silk, 3) 1 tree gave 0.644 kilograms of silk, 4) 1 tree gave 0.649 kilograms of silk and 5) 1 tree gave 1.45 kilograms of silk (his own silkworm rearing attempt). So, Mean = 1.00 kg (n = 5). From his other calculations it is proven that silkworm eggs had a 75.5% hatchability, a 50.4% survival rate for silkworm larvae hatching until cocoon harvest and a raw silk yield of 8.00%, that is the amount of raw silk produced (8 kg) from 100 kg of fresh cocoons.
118. See note 112 above; see text in Appendix Segment 47.
119. Clugnet, *Géographie de la soie*, 136–41.
120. Guillou, "Production," 94; Jacoby, "Silk in western Byzantium," 476, n. 130.
121. López Martínez de Marigorta, *Mercaderes*, 56; Sánchez Martínez, "La cora de Ilbira," 24; see text in Appendix Segment 48. Sánchez Martínez, Manuel A. (1976) provides the narrative by the geographer al-ʿUdhrī, (1003–1085) who includes in his description of the province (*kūra*)

of Elvira (Ilbīra), corresponding to the present-day regions of Granada and Almería, data about the tax revenues in the province of Elvira during the reign of al-Ḥakam (796–822) and his son ʿAbd al-Raḥmān (822–852). The narrative describes the revenues for 1000 *ritl* of silk which is about 504 kg of silk (1 *ritl* = 504 g). This figure of silk from al-Andalus, specifically from the province (*kūra*) of Elvira (Ilbīra), is translated by M. Sánchez Martínez (1976) p. 24 as 1,000 *riṭl* (504 kg) of silk. However, E. López Martínez de Marigorta (2021) p. 56 reread the figure as 2,000 *riṭl* (1008 kg) of silk.

This is the only text that exists to allude to the sustainable presence of silkworm rearing in Europe before 961. The text as such may serve as the first indication that silkworm rearing was taking place in Elvira during the early 9th century but:

(1) The text does not specify if it is raw silk (it states silk) or textiles;
(2) The text does not specify if it is imported or produced locally;
(3) The text does not specify whether this is the annual production or the 50-year total production. There is nothing in the text to conclude that, instead the text states: "*during the emirates of al-Ḥakam and his son*";
(4) Furthermore, the text does not mention silkworms or cocoons.

Therefore, as such the text serves as the first indication that silkworm rearing was taking place in Elvira during the early 9th century, but it does not describe what sort of silk it refers to (raw silk, or textile) and, in the case of raw silk, whether it was locally produced or imported. As such, it is the equivalent to the descriptions presented for the Byzantine Empire in the *Book of the Prefect*.

122. Goitein, *Sicily and Southern Italy*; Goitein, *A Mediterranean Society*, Vol. III; Jacoby, "Silk and Silk Textiles."

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This research was funded by the project: Advocating the Role of silk Art and Cultural heritage at National and European scale – Aracne (European Union's Horizon Europe Research and Innovation Programme: Grant Agreement [101095188]).

Author contributions

P. F.: Archival text analysis, image preparation, writing and editing of the manuscript. C. Z.: Archival text analysis, resources, writing and editing of the manuscript. S. G. D.: Archival text analysis, image preparation, writing and editing of the manuscript.

Data availability statement

The calculations that support the data presented in Table 1 are openly available in a.xlxs format in FigShare at https://figshare.com/articles/dataset/dx_doi_org_10_6084_m9_figshare_6025748/6025748.

Declaration of generative AI in scientific writing

During the preparation of this work the authors did not use AI tools to generate translations of archival texts that are presented in the manuscript and its Appendix.

ORCID

Panagiota Fragkou http://orcid.org/0009-0006-9231-9650
Skarlatos G. Dedos http://orcid.org/0000-0002-0432-338X

Notes on contributors

Panagiota Fragkou is a PhD student specializing in silkworm developmental biology. With a strong foundation in biochemistry and multiomics data analysis, this study served as a key turning point, allowing her to broaden her research scope into historical evolutionary data analysis and to explore the anthropogenic influences that shaped the spread and development of sericulture in Europe.

Claudio Zanier is an Emeritus Professor at the University of Pisa, and a prominent historian specializing in the history of textiles, particularly silk production and trade between Europe and Asia. His work bridges economic history and material culture, with a strong focus on the transmission of sericultural knowledge across cultural and geographical boundaries.

Skarlatos G. Dedos is an Associate Professor of Zoology at the National and Kapodistrian University of Athens. He is a multidisciplinary researcher with expertise in biochemistry, molecular biology and data analysis. His work integrates contemporary multiomics approaches with the study of biological specimens focusing, in this study, on the silkworm.

Bibliography

Adler, Ada. *Suidae lexicon, 4 vols. [Lexicographi Graeci 1.1-1.4*. Leipzig: Teubner, 1928.
Adler, Marcus Nathan. *The Itinerary of Benjamin of Tudela*. Edited by H. Frowde. London: Oxford University Press, 1907.
Al-Bakrī, ʻAbd Allāh b. ʻAbd ʻAziz. *Description de l'Afrique septentrionale*. Paris: Imprimerie impériale, 1859.
Al-Bakrī, ʻAbd Allāh b. ʻAbd ʻAziz. *Geografía de España*: Zaragoza: Anubar Ediciones, 1982.
Al-Idrīsī, Muḥammad b. Muḥammad. *Description de l'Afrique et de l'Espagne*. *Texte arabe avec une tr. des notes et un glossaire par R. Dozy et M. J. de Goeje*. Edited by R. P. A. Dozy. Leiden: Brill, 1866.
Al-Wansharīsī, Ahmad ibn Yahya. *Al-Mi'yar al-mu'rib wa-l-yami' al-mugrib `an fatawi ahl Ifriqiya wa-l-Andalus wa-l-Magrib*. Rabat: Dar al-Maghrib al-Islami, 1981.
Arabatzis, George. "Michael of Ephesus and the philosophy of living things (in *De partibus animalium* 22.25–23.9)." In *The Many Faces of Byzantine Philosophy*, edited by K. Ierodiakonou and B. Bydén. Athens: The Norwegian Institute at Athens, 2012.
Bartoloni, Franco. *Le più antiche carte dell'abbazia di San Modesto in Benevento (secoli VIII–XIII), in Regesta chartarum Italiae*. Vol. 33: Roma: Sede dell'Istituto, 1950.
Bassus, Cassianus (Beckh, H.). Geoponica *sive Cassiani Bassi Scholastici* De re rustica eclogae *[Gr.]*. Leipzig: Teubner, 1895.
Bees, Nikos. "Unedierte Schriftstücke aus der Kanzlei des Johannes Apokaukos des Metropoliten von Naupaktos (in Aetolien)," *Byzantinisch-neugriechische Jahrbücher*, 57–160. 1974.
Bekker, Immanuel. *Historia*. Bonn: E. Weber, 1835.
Bekker, Immanuel. *Suidae lexicon ex recogn*. Berlin: I. Bekkeri, 1854.
Berghoff, Wilhelm. *Palladius. De gentibus Indiae et Bragmanibus, Beiträge zur klassischen Philologie; Heft 24*. Meisenheim am Glan: A. Hain, 1967.
Betti, Zaccaria. *Del baco da seta: canti IV, con annotazione*. Verona: Per Antonio Andreoni, 1756.
Boak, Arthur Edward Romilly. *The Book of the Prefect*. Cambridge: Harvard University Press, 1929.
Broadhurst, Ronald J. C. *The Travels of Ibn Jubayr, Being the Chronicle of a Mediaeval Spanish Moor Concerning His Journey to the Egypt of Saladin, the Holy Cities of Arabia, Baghdad the*

City of the Caliphs, the Latin Kingdom of Jerusalem, and the Norman Kingdom of Sicily. London: J. Cape, 1952.
Casola, Pietro and Mary Margaret Newett. *Canon Pietro Casola's Pilgrimage to Jerusalem in the Year 1494*. Manchester: University Press, 1907.
Chalandon, Ferdinand. *Histoire de la domination normande en Italie et en Sicile*. Paris: Librairie A. Picard et fils, 1907.
Chatham, James. *A Paleographic Edition of the Alfonsine Collection of Prose Miracles of the Virgin*. Fort Worth: Texas Christian University Press, 1976.
Chin, Tamara. "The Invention of the Silk Road, 1877." *Critical Inquiry* 40, no. 1 (2013): 194–219.
Christophorides, Venizelos. *Isidore Glava, Archbishop of Thessaloniki, Speeches*. Vol. 1. Thessaloniki: P. Pournaras, 1996. (Collection byzantine publiée sous le patronage de l'Association Guillaume Budé)
Clugnet, Léon. *Géographie de la soie: étude géographique et statistique sur la production et le commerce de la soie en cocon*. Lyon: La Libririe Georg, 1877.
Constantin VII, Porphyrogénète. *Le Livre des cérémonies*. Translated and edited by Albert Vogt. Paris: Les Belles lettres, 1935.
de Crescentiis, Pietro. *Libro dell'Agricoltura*. Florence: Giunti, 1605.
Demaison, Louis. *Recherches sur la soie que les anciens tiraient de l'île de Cos*. Reims: Imprimerie coopérative, 1884.
de Quatrefages, Armand. *Essai sur l'histoire de la sériciculture et sur la maladie actuelle des vers à soie*. Paris: Hachette, 1860.
de Szombathely, Marino. *Statuti di Trieste del 1350*. Trieste: Cappelli, 1930.
Diller, Aubrey. *Studies in Greek Manuscript Tradition*. Amsterdam: A. M. Hakkert, 1983.
Dindorf, Ludwig August. *Historici Graeci minores*. Leipzig: Teubner, 1870.
Dodgeon, Michael H., and Samuel N. C. Lieu. *The Roman Eastern Frontier and the Persian Wars: AD 363–630: a narrative sourcebook*: London: Routledge, 1991.
Doukas. *Istoria turco-bizantină (1341–1462)*. Edited by V. Grecu. Bucharest: Editura Academiei Republicii Populaire Romîne, 1958.
Dozy, Reinhart Pieter Anne. *Le Calendrier de Cordoue de l'année 961. Texte arabe et ancienne traduction latine*. Edited by R. Dozy. Leiden: Brill, 1873.
Dübner, Friedrich, and Franz Siegfried Lehrs. *Manuelis Philae versus iambici de proprietate animalium, Poetae bucolici et didactici*. Paris: Didot, 1862.
Fábregas García, Adela. "Aprovisionamiento de la seda en el reino nazarí de Granada: vías de intervención directa practicadas por la comunidad mercantil genovesa." *En la España medieval* 27 (2004): 53–75.
Fábregas Garcia, Adela. "La seda en el reino nazarí de Granada." In *Las rutas de la Seda en España y Portugal*, edited by Ricardo Franch and German Navarro, 39–63. Valencia: Universidad de Valencia, 2017.
Falcando, Ugo. *The History of the Tyrants of Sicily by "Hugo Falcandus,"* 1154–69. Manchester, UK: Manchester University Press, 1998.
Forbes, William Trowbridge Merrifield. "The Silkworm of Aristotle." *Classical Philology* 25 (1) (1930): 22–26, doi:10.1086/361193.
Frye, Richard Nelson. *The History of Ancient Iran*. Munich: C. H. Beck, 1984.
García Sánchez, Expiración. *Flora agrícola y forestal de Al-Andalus*. Madrid: Ministerio de Agricultura, Alimentación y Medio Ambiente, Centro de Publicaciones, 2021.
Garrad, Keith. "La industria sedera granadina en el siglo XVI y en conexión con el levantamiento de las Alpujarras (1568–1571)." *Miscelánea de Estudios Árabes y Hebraicos*. Sección Árabe-Islam 5 (1956): 73–104.
Giet, Stanislas. *Basile de Césarée. Homélies sur l'Hexaéméron*: Paris: Éditions du Cerf, 1968.
Goitein, Shelomo Dov. *Sicily and Southern Italy in the Cairo Geniza Documents*. Catania: Società di Storia Patria per la Sicilia Orientale, 1971.
Goitein, Shelomo Dov, Paula Sanders, and Gustave Edmund von Grunebaum. *A Mediterranean Society: The Jewish Communities of the Arab World as Portrayed in the Documents of the Cairo Geniza*, Vol. I: *Economic Foundations*. Oakland, CA: University of California Press, 1967.

Goitein, Shelomo Dov, Paula Sanders, and Gustave Edmund von Grunebaum. *A Mediterranean Society: The Jewish Communities of the Arab World as Portrayed in the Documents of the Cairo Geniza*, Vol. III: *The Family*. Oakland, CA: University of California Press, 1967.

Good, Irene. "On the question of silk in pre-Han Eurasia." *Antiquity* 69, no. 266 (1995): 959–68, doi:10.1017/S0003598X00082491.

Good, Irene. "Archaeological Textiles: A Review of Current Research." *Annual Review of Anthropology* 30 (2001): 209–26, doi:10.1146/annurev.anthro.30.1.209.

Good, Irene. "The Archaeology of Early Silk." Presented at *Silk Roads, Other Roads: Proceedings of the 8th Biennial Symposium of the Textile Society of America*, September 26–28, 2002, Northampton, MA, 2002.

Guichard, Joseph. *L'art de faire éclorre et d'élever les vers a soie: tel qu'on le pratique dans le Levant*. Avignon: Chez J. Guichard, 1786.

Guillou, André. "Production and Profits in the Byzantine Province of Italy (Tenth to Eleventh Centuries): An Expanding Society." *Dumbarton Oaks Papers* 28 (1974): 89–109, doi:10.2307/1291356.

Harvey, Alan. *Economic Expansion in the Byzantine Empire: 900-1200*. Cambridge: Cambridge University Press, 1989.

Hayduck, Michael and Hieronymus Vitelli. *Ioannis Philoponi (Michaelis Ephesii) in libros de generatione animalium commentaria*. Berlin: De Gruyter, 2013.

Herbst, Wilhelm. *Galeni Pergameni de Atticissantium studiis testimonia collecta atque examinata: pars prima seorsum expressa*. Marburg: Academia Philippina Marpurgensi, 1910.

Houben, Hubert. *Roger II of Sicily: A Ruler Between East and West*. Cambridge, UK: Cambridge University Press, 2002.

Ierodiakonou, Katerina. "Michael of Ephesus." In *Encyclopedia of Medieval Philosophy: Philosophy between 500 and 1500*, edited by H. Lagerlund, 1–3. Dordrecht: Springer Netherlands, 2018.

Jacoby, David. "Silk in western Byzantium before the fourth crusade," 84–85. Publication no. 2 (1992): 452–500, doi:10.1515/byzs.1992.84-85.2.452.

Jacoby, David. "Silk and Silk Textiles in Arab and Norman Sicily: The Economic Context." In *Nobiles Officinae. Die königlichen Hofwerkstätten zu Palermo zur Zeit der Normannen und Staufer im 12. und 13. Jahrhundert*, catalogue of the Kunsthistorisches Museum, 61–73. Wien, Milano: Skira, 2004.

Jacoby, David. "The production and diffusion of Andalusi silk and silk textiles, mid-eighth to mid-thirteenth century." In *The Chasuble of Thomas Becket: A Biography*, edited by A. Shalem, 142–151. The Bruschettini Foundation for Islamic and Asian Art, Hirmer Publishers, 2017.

James, Paul, and Manfred Bernhard Steger. "A Genealogy of 'Globalization': The Career of a Concept." *Globalizations* 11, no. 4 (2014): 417–34, doi:10.1080/14747731.2014.951186.

Jørgensen, Lise Bender. "The question of prehistoric silks in Europe." *Antiquity* 87, no. 336 (2013): 581–88, doi:10.1017/S0003598X00049140.

Koder, Johannes. *Das Eparchenbuch Leons des Weisen [Corpus Fontium Historiae Byzantinae], Series Vindobonensis 33*. Vienna: Österreichische Akademie der Wissenschaften, 1991.

Kollias, Taxiarhes G. *The Book of the Prefect by Leon the Wise*. Athens: Kanakis, 2010.

Kotter, Bonifatius. *Die Schriften des Johannes von Damaskos*. Berlin: De Gruyter, 1973.

Lafuente y Alcántara, Emilio. *Ajbar Machmuâ: crónica anónima del siglo XI, dada à luz por primera vez*. Madrid: Imprenta y Estereotipia de M. Rivadeneyra, 1867.

Lagardère, Vincent. "Mûrier et culture de la soie en Andalus au Moyen Âge (X^{e}–XIV^{e} siècles)." *Mélanges de la Casa de Velázquez* (1990): 97–111.

Laiou, Angeliki E., and Charalampos Bouras. *The Economic History of Byzantium: From the Seventh Through the Fifteenth Century*. Washington, DC: Dumbarton Oaks Research Library and Collection, 2002.

Lazzarelli, Ludovici. *Ludovici Lazzarelli Septempedani … Bombyx accesserunt ipsius aliorumque poetarum carmina cum commentariis de vitis eorumdem Joanne Francisco Lancillottio a Staphylo auctore*. Florence: apud Petrum Paulum Bonelli, 1765.

Lee, Boyoung, Elisabete Pires, A. Mark Pollard, and James S. O. McCullagh. “Species identification of silks by protein mass spectrometry reveals evidence of wild silk use in antiquity.” *Scientific Reports* 12, no. 1 (2022): 4579, doi:10.1038/s41598-022-08167-3.

Lombard, Maurice. *Les textiles dans le monde musulman du VII^e^ au XII^e^ siècle*. The Hague and New York: The Hague and, 1978.

Lopez, Robert Sabatino. “Silk Industry in the Byzantine Empire.” *Speculum* 20, no. 1 (1945): 1–42, doi:10.2307/2851187.

López de Coca Castañer, and José Enrique. “‘Morus nigra’ vs ‘Morus alba’ en la sericultura mediterránea: el caso del reino de Granada (siglo XVI).” Presented at the *Le vie del Mediterraneo. Idee, uomini, oggetti (secoli XI–XVI*), Genoa, 1997.

Lopez-Marigorta, Eneko. “How al-Andalus wrapped itself in a silk cocoon: the ṭirāz between Umayyad economic policy and Mediterranean trade.” *Mediterranean Historical Review* 38, no. 1 (2023): 1–23, doi:10.1080/09518967.2023.2181525.

López Martínez de Marigorta, Eneko. *Mercaderes, artesanos y ulemas*. Jaén: Universidad de Jaén, UJA Editorial, 2021.

Lu, Wei, Tong Zhang, Quan Zhang, Na Zhang, Ling Jia, Sanyuan Ma, and Qingyou Xia. “FibH Gene Complete Sequences (FibHome) Revealed Silkworm Pedigree.” *Insects* 14, no. 3 (2023): 244.

Lubec, Gert, Johann Holaubek, Christoph Feldl, Beate Lubec, and Eugen Strouhal. “Use of silk in ancient Egypt.” *Nature* 362, no. 6415 (1993): 25, doi:10.1038/362025b0.

Maltretus, Claudius. *Procopius (of Caesarea)*. Bonn: E. Weber, 1833.

Maniatis, George C. “Organization, Market Structure, and Modus Operandi of the Private Silk Industry in Tenth-Century Byzantium.” *Dumbarton Oaks Papers* 53 (1999): 263–332, doi:10.2307/1291804.

Mavridis, Dimitrios G., and Konstantinos I. Vatalis. “Products and Markets – The Activities of the Imperial Guilds of Constantinople.” *Procedia Economics and Finance* 24 (2015): 376–85, doi:10.1016/S2212-5671(15)00685-1.

Migne, Jacques-Paul, and Theodor Hopfner. *Patrologiae cursus completus, series graeca*. Paris: Imprimerie Catholique, 1857.

Mommsen, Theodor, Paulus Krueger, and Rudolphus Schoell. *Corpus juris civilis*. Berlin: Weidmann, 1895.

Moravcsik, Gyula, and Romilly James Heald Jenkins. *Constantine Porphyrogenitus De Administrando Imperio*. Washington, DC: Dumbarton Oaks Center for Byzantine Studies, 1967.

Müller, Karl. *Geographi Graeci minores*. Paris: A. Firmin-Didot, 1861.

Muthesius, Anna. “From Seed to Samite: Aspects of Byzantine Silk Production.” *Textile History* 20, no. 2 (1989): 135–49, doi:10.1179/004049689793700185.

Muthesius, Anna. “The Byzantine silk industry: Lopez and beyond.” *Journal of Medieval History* 19, no. 1 (1993): 1–67, doi: 10.1016/0304-4181(93)90009-2.

Muthesius, Anna. *Studies in Byzantine and Islamic Silk Weaving*: Edinburgh: Pindar Press, 1995.

Muthesius, Anna. “Essential processes, looms, and technical aspects of the production of silk textiles.” *The Economic History of Byzantium* 3 (2002): 147–68.

Nauck, August. *Tragicorum Graecorum fragmenta*. Leipzig: Teubner, 1889.

Nicole, Jules. *Le livre du Préfet ou l’édit de l’empereur Léon le Sage sur les corporations de Constantinople (Œuvre numérisée par Marc Szwajcer)*. Lyon: Genève & Bale, 1894.

Oikonomidès, Nicolas. “Silk Trade and Production in Byzantium from the Sixth to the Ninth Century: The Seals of Kommerkiarioi.” *Dumbarton Oaks Papers* 40 (1986): 33–53, doi:10.2307/1291528.

Panagiotakopulu, Eva, Paul C. Buckland, Peter M. Day, Christos Doumas, Anaya Sarpaki, and Paul Skidmore. “A lepidopterous cocoon from Thera and evidence for silk in the Aegean Bronze Age.” *Antiquity* 71, no. 272 (1997): 420–29, doi:10.1017/S0003598X00085021.

Parenzan, Paolo and Porcelli, Francesco. “Notes on the biology and behaviour of Pachypasa otus Drury (Lepidoptera - Lasiocampidae) in southern Italy.” *Entomologica* 20 (1985): 109–23.

Pétridès, Sophrone. "Jean Apokaukos, Lettres et autres documents inédits." *Izvestija Russkago Archeologiceskago Instituta v Konstantinopole* 14 (1909): 72–100.
Pfister, Rudolf. *Textiles de Palmyre*. Paris: Éditions d'Art et d'Histoire, 1934.
Poni, Carlo. *La seta in Italia: una grande industria prima della rivoluzione industriale*. Bologna: Il Mulino, 2009.
Porson, Richard. *Photii Lexicon e codice Galeano*. Leipzig: C. H. F. Hartmanni, 1822.
Qiang, Li, and Stefanos Kordosis. "The Geopolitics on the Silk Road: Resurveying the Relationship of the Western Türks with Byzantium through Their Diplomatic Communications M2 109." *Medieval Worlds* 8 (2018): 109–25.
Rezakhani, Khodadad. *ReOrienting the Sasanians: East Iran in Late Antiquity.* Edinburgh: Edinburgh University Press, 2017.
Sánchez Martínez, Manuel A. La cora de Ilbira (Granada y Almería) en los siglos X y XI, según al-Udri (1003–1085). *Cuadernos de Historia del Islam* 7 (1976): 5–82.
Schmidt, Moritz. *Hesychii Alexandrini lexicon.* Ed. minorem curavit M.Schmidt. Jena: H. Wichelhausen, 1867.
Simon, Dieter. "Die Byzantinischen Seidenzunft." *Byzantinische Zeitschrift* 68, no. 1 (1975): 23–46.
Spiro, Friedrich. *Pausaniae Graeciae descriptio*. 3 Vols. Leipzig: Teubner, 1903.
Stückelberger, Alfred, and Gerd Graßhoff. *Klaudios Ptolemaios Handbuch der Geographie: griechisch-deutsch*: Basel: Schwabe, 2006.
Sun, Wei, HongSong Yu, YiHong Shen, Yutaka Banno, ZhongHuai Xiang, and Ze Zhang. "Phylogeny and evolutionary history of the silkworm." *Science China Life Sciences* 55, no. 6 (2012): 483–96, doi:10.1007/s11427-012-4334-7.
Tazima, Yataro. *The Silkworm: An Important Laboratory Tool*. Tokyo: Kodansha, 1978.
Toubert, Pierre. "Un mythe historiographique: la sériciculture italienne du haut Moyen Âge (ix^{e}-x^{e} siècles)." In *Horizons marins, itinéraires spirituels (V^{e}–XVIII^{e} siècles)*. Volume II: *Marins, navires et affaires*, edited by H. Dubois, J. Hocquet, and A. Vauchez. Paris: Éditions de la Sorbonne, 1987.
Tzetzes, John. *Ioannis Tzetzae Historiarum variarum Chiliades: Graece, textum ad fidem duorum codicum monacensium recognovit*. Leipzig: C. G. Vogelii, 1826.
Unger, Roberus. *Commentationes de Thebarum Boeticarum primordiis de fluviis fontibusque Thebani agri: et de urbis Thebanae portis*. Jena: Lipperti et Schmidtii, 1845.
Vida, Marci Hieronymi. *Marci Hieronymi Vidae . . . De arte poetica lib. III; eiusdem De bombyce lib. II; eiusdem De ludo scacchorum lib. I; eiusdem Hymni; eiusdem Bucolica*. Rome: Ludouicum Vicentinum, 1527.
Vincens-Saint-Laurent, Jacques M. "Recherches sur l'origine de la soie, et sur l'introduction du mûrier en France." *Compte-Rendu à l'Académie du Gard* (1809).
von Lingenthal, Karl Eduard Zachariae. *Jus Graeco-Romanum: Practica ex actis Eustathii Romani*. Leipzig: Weigel, 1856.
von Pauly, August Friedrich, Georg Wissowa, Wilhelm Kroll, and Kurt Witte. *Paulys Real-Encyclopädie der classischen Altertumswissenschaft. 2. [i.e. Zweite] Reihe (R-Z)*. Stuttgart: J. B. Metzler, 1937.
von Richthofen, Ferdinand Freiherrn. *China: Ergebnisse eigener Reisen un darauf gegründeter Studien. [With, Atlas]*. Berlin: D. Reimer, 1877.
Westermann, Antonius. *Stephani Byzantii Ethnicon quae supersunt edidit Antonius Westermann*. Leipzig: Teubner, 1839.
Wimmer, Friedrich. *Theophrasti Eresii Opera quae supersunt omnia*. Vol. 1. Leipzig: Teubner, 1854.
Wu, Gang. "Reconstructing the Byzantine sericulture practice." *Byzantinische Zeitschrift* 116, no. 3 (2023): 1013–34, doi:10.1515/bz-2023-0042.
Wu, Gang. "Mapping Byzantine Sericulture in the Global Transfer of Technology." *Journal of Global History* 19, no. 1 (2024): 1–17, doi:10.1017/S1740022823000050.
Wünsch, Ricardus. *Ioannis Laurentii Lydi Liber de mensibus*. Leipzig: Teubner, 1898.

Yates, James. *Textrinum Antiquorum: an Account of the Art of Weaving Among the Ancients: On The Raw Materials Used For Weaving*. London: Taylor and Walton, 1843.

Yver, Georges. *Le commerce et les marchands dans l'Italie méridionale au xiii^e^ & au xiv^e^ siècle*. Paris: Albert Fontemoing, 1903.

Zanier, Claudio. *Miti e culti della seta: dalla Cina all'Europa*. Padova: Cleup, 2019.

Zanier, Claudio. "Silk Cultivatiom (sic) in Italy: Medieval and Early Modern." *Journal of Medieval Worlds* 1, no. 4 (2019): 41–44, doi:10.1525/jmw.2019.1.4.41.

Zanier, Claudio. "The Silk Cycle in China and its Migration." In *Seri-Technics: Historical Silk Technologies*, edited by Dagmar Schäfer, Giorgio Riello, and Luca Molà. Berlin: Max-Planck-Gesellschaft zur Förderung der Wissenschaften, 2020.

Zanier, Claudio. "The migration of silk production from China to Europe and its subsequent development." In *Textiles and Clothing along the Silk Roads*, edited by F. Zhao, M-L. Nosch. Paris/Hangzhou: UNESCO, China National Silk Museum, 2022.

Appendix

Segment 1

Aristotle (384–322 BC), History of Animals

Ἐκ δέ τινος σκώληκος μεγάλου, ὃς ἔχει οἷον κέρατα καὶ διαφέρει τῶν ἄλλων, γίγνεται πρῶτον μὲν μεταβαλόντος τοῦ σκώληκος κάμπη, ἔπειτα βομβύλιος, ἐκ δὲ τούτου νεκύδαλος ἐν ἓξ δὲ μησὶ μεταβάλλει ταῦτας τὰς μορφὰς πάσας. Ἐκ δὲ τοῦτου τοῦ ζῴου καὶ τὰ βομβύκια ἀναλύουσι τῶν γυναικῶν τινες ἀναπηνιζόμεναι, κἄπειτα ὑφαίνουσι πρώτη δὲ λέγεται ὑφῆναι ἐν Κῷ Παμφίλη Πλάτεω θυγάτηρ.

Translation:

From a large worm, which has horn-like features and differs from others, initially, as the worm transforms, it becomes a caterpillar, then an insect, and from that a butterfly; within six months, it changes through all these forms. From this creature, some women unwind the cocoons, loosen the threads, and then weave them. It is said that the first to weave in Kos was Pamphile, the daughter of Platea. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

William Trowbridge Merrifield Forbes, "The Silkworm of Aristotle." *Classical Philology* 25, no. 1 (1930).

Segment 2

Pausanias (ca. 110–180), Description of Greece

ἡ δὲ Ἠλεία χώρα τά τε ἄλλα ἐστὶν ἐς καρποὺς καὶ τὴν βύσσον οὐχ ἥκιστα ἐκτρέφειν ἀγαθή. τὴν μὲν δὴ κανναβίδα καὶ λίνον καὶ τὴν βύσσον σπείρουσιν ὅσοις ἡ γῆ τρέφειν ἐστὶν ἐπιτήδειος· οἱ μίτοι δέ, ἀφ᾽ ὧν τὰς ἐσθῆτας ποιοῦσιν οἱ Σῆρες, ἀπὸ οὐδενὸς φλοιοῦ, (5) τρόπον δὲ ἕτερον γίνονται τοιόνδε. ἔστιν ἐν τῇ γῇ ζωύφιόν σφισιν, ὃν σῆρα καλοῦσιν Ἕλληνες, ὑπὸ δὲ αὐτῶν Σηρῶν ἄλλο πού τι καὶ οὐ σὴρ ὀνομάζεται· μέγεθος μέν ἐστιν αὐτοῦ διπλάσιον ἢ κανθάρων ὁ μέγιστος, τὰ δὲ ἄλλα εἴκασται τοῖς ἀράχναις, οἳ ὑπὸ τοῖς δένδρεσιν ὑφαίνουσι, καὶ δὴ καὶ πόδας ἀριθμὸν ὀκτὼ κατὰ ταὐτὰ ἔχει τοῖς ἀράχναις. ταῦτα τὰ ζῷα τρέφουσιν οἱ Σῆρες οἴκους κατασκευασάμενοι χειμῶνός τε καὶ θέρους ὥρᾳ ἐπιτηδείους· τὸ δὲ ἔργον τῶν ζῴων κλῶσμα εὑρίσκεται λεπτὸν τοῖς ποσὶν αὐτῶν περιειλιγμένον. τρέφουσι δὲ αὐτὰ ἐπὶ μὲν τέσσαρα ἔτη παρέχοντες τροφὴν σφισιν ἔλυμον, πέμπτῳ δὲ—οὐ γὰρ πρόσω βιωσόμενα ἴσασι—κάλαμον διδόασιν ἐσθίειν χλωρόν· ἡ δέ ἐστιν ἡδίστη τροφὴ πασῶν τῷ ζῴῳ, καὶ ἐμφορηθὲν τοῦ καλάμου ῥήγνυταί τε ὑπὸ πλησμονῆς καὶ ἀποθανόντος οὕτω τὸ πολὺ τῆς ἁρπεδόνης εὑρίσκουσιν ἔνδον. γινώσκεται δὲ ἡ Σηρία νῆσος ἐν μυχῷ θαλάσσης κειμένη τῆς Ἐρυθρᾶς. ἤκουσα δὲ καὶ ὡς οὐχ ἡ Ἐρυθρά, ποταμὸς δὲ ὃν Σῆρα ὀνομάζουσιν, οὗτός ἐστιν ὁ ποιῶν νῆσον αὐτήν, ὥσπερ καὶ Αἰγύπτου τὸ Δέλτα ὑπὸ τοῦ Νείλου καὶ οὐχ ὑπὸ μιᾶς περιέχεσθαι θαλάσσης· τοιαύτην ἑτέραν καὶ τὴν Σηρίαν νῆσον εἶναι. οὗτοι μὲν δὴ τοῦ Αἰθιόπων γένους αὐτοί τέ εἰσιν οἱ Σῆρες καὶ ὅσοι τὰς προσεχεῖς αὐτῇ νέμονται νήσους, Ἄβασαν καὶ Σακαίαν· οἱ δὲ αὐτοὺς οὐκ Αἰθίοπας, Σκύθας δὲ ἀναμεμιγμένους Ἰνδοῖς φασὶν εἶναι.

Translation:

The fibres from which the Seres make their clothes do not come from any bark, but are produced in another way. There is a creature that Greeks call "sēra" and the Seres themselves name differently. It is twice the size of the largest beetle, and resembles a spider that weaves under trees, with eight legs like a spider. The Seres breed these creatures in suitable huts in winter and summer. The thread they produce is fine and wraps around their legs. They rear them for four years, feeding them with leaves from elms, and in the fifth year, knowing they won't live much longer, they give them fresh cane to eat. This is their favourite food, and filling up with cane, they burst from the abundance and thus find most of the fibre inside them. Sēria is a known islet in the Gulf of the Red Sea. I also heard that it's not the Red Sea, but a river named Seras that creates this island, like the Nile Delta in Egypt from the Nile and not from a single sea. The Seres are a tribe of Ethiopians, and those who live on the nearby islands Abase and Sacaea; They do not call themselves Ethiopians but consider themselves as Scythians mixed with Indians. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Friedrich Spiro, *Pausaniae Graeciae descriptio*. 3 vols. Leipzig: Teubner, 1903.

Segment 3

Photius I (ca. 815–893), Lexicon

Σῆρες· ἔθνος, ἔνθα ἡ μέταξα γίνεται, ἐξ οὗ καὶ σηρικὰ τὰ ἐκ μετάξης ὑφασμένα λέγεται.

Translation:

Seres: A nation where silk is produced. From the word Seres comes the word "serica" for the fabrics woven from silk. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

James Yates, *Textrinum Antiquorum: an Account of the Art of Weaving Among the Ancients: On The Raw Materials Used For Weaving*. London: Taylor and Walton, 1843.

Segment 4

Basil of Caesarea (330–378), Hexaemeron

Ὁποῖα καὶ περὶ τοῦ Ἰνδικοῦ σκώληκος ἱστορεῖται τοῦ κερασφόρου· ὃς εἰς κάμπην τὰ πρῶτα μεταβαλὼν, εἶτα προϊὼν βομβυλιὸς γίνεται, καὶ οὐδὲ ἐπὶ ταύτης ἵσταται τῆς μορφῆς, ἀλλὰ χαύνοις καὶ πλατέσι πετάλοις ὑποπτεροῦται. Ὅταν οὖν καθέζησθε τὴν τούτων ἐργασίαν ἀναπηνιζόμεναι, αἱ γυναῖκες, τὰ νήματα λέγω ἃ πέμπουσιν ὑμῖν οἱ Σῆρες πρὸς τὴν τῶν μαλακῶν ἐνδυμάτων κατασκευὴν, μεμνημέναι τῆς κατὰ τὸ ζῷον τοῦτο μεταβολῆς, ἐναργῆ λαμβάνετε τῆς ἀναστάσεως ἔννοιαν.

Translation:

Just as it is reported about the Indian horned worm, which first transforms into a caterpillar, then gradually becomes a cocoon, and it does not even remain in this form, but acquires wings with hollow and wide petals. So, when you engage in their work by reeling silk, women, the threads I mean that the Seres send you for the making of soft garments, remembering the transformation of this creature, you gain a clear understanding of the resurrection. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Stanislas Giet, *Basile de Césarée. Homélies sur l'Hexaéméron*. Paris: Ed. du Cerf, 1968.

Segment 5

Palladius of Galatia (353–420), On the Races of India and the Brahmans

Διήγημα δὲ φέρεται Ἀλεξάνδρου τοῦ τῶν Μακεδόνων βασιλέως ἐξηγησαμένου ποσῶς τὸν βίον αὐτῶν· κἀκείνῳ δὲ τάχα ὑπῆρχεν ὡς ἐκ παρακούσματος· οὔτε γὰρ αὐτός, ὡς οἶμαι, τὸν Γάγγην ἐπεραιώθη, ἀλλ' ἄχρι τῆς Σηρικῆς φθάσας, ἔνθα τὸν μέταξον οἱ σῆρες τίκτουσιν, κἀκεῖ λιθίνην στήλην στήσας ἐπέγραψεν· Ἀλέξανδρος ὁ Μακεδὼν ἔφθασε μέχρι τοῦ τόπου τούτου.

Translation:

There is said to be an account of Alexander, the king of the Macedonians, which does not at all recount in detail their lives; and for him perhaps there was from a mistaken hearing; nor did he, I believe, cross the Ganges, but he reached Serica, where the silkworms produce silk, and there he set up a stone pillar and inscribed: Alexander the Macedonian reached this place. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Wilhelm Berghoff, *Palladius. De gentibus Indiae et Bragmanibus, Beiträge zur klassischen Philologie; Heft 24*. Meisenheim am Glan: A. Hain, 1967.

Segment 6

John the Lydian (ca. 490–565), On The Months

Ὅτι ὁ Νουμᾶς τὴν βασιλικὴν ἐσθῆτα εἰς τιμὴν Ἡλίου καὶ Ἀφροδίτης ἐκ πορφύρας καὶ κόκκου κατασκευάζεσθαι διετύπωσεν—καὶ Βλάττα δέ, ἐξ ἧς τὰ βλάττια λέγομεν, ὄνομα Ἀφροδίτης ἐστὶ κατὰ τοὺς Φοίνικας, ὡς ὁ Φλέγων ἐν τῷ περὶ ἑορτῶν φησι. ὅτι (5) τριακοσίοις ἐγγὺς ὀνόμασιν εὑρίσκομεν καλουμένην τὴν Ἀφροδίτην, κεῖται δὲ παρὰ Λαβεῶνι τὰ ὀνόματα.

Translation:

That Numa decreed the royal garment to be made in honour of the Sun and Venus from purple and kermes oak – and Blatta, from which we name the purple silk fabrics, is the name by which the Phoenicians call Venus, as Phlegon mentions in his work about festivals. That with approximately three hundred names we find Venus being called, these names are listed in Labeo. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Ricardus Wünsch, *Ioannis Laurentii Lydi Liber de mensibus*. In aedibus B.G. Teubneri, 1898.

Segment 7

Stephen of Byzantium (sixth century), The Ethnica

Σῆρες, ἔθνος Ἰνδικόν, ἀπροσμιγὲς ἀνθρώποις, ὡς Οὐράνιος ἐν τρίτῳ Ἀραβικῶν.

Translation:

Seres, an Indian nation, unmingled with other people, as Uranios mentions in the third book of the Arabica. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Antonius Westermann, *Stephani Byzantii Ethnicon quae supersunt edidit Antonius Westermann*. Sumptibus et typis B.G. Teubneri, 1839.

Segment 8

Constantine VII Porphyrogenitus (905–959), On Imperial Administration

Περὶ τῶν Πατζινακιτῶν καὶ Χερσωνιτῶν. Ὅτι καὶ ἕτερος λαὸς τῶν τοιούτων Πατζινακιτῶν τῷ μέρει τῆς Χερσῶνος παράκεινται, οἵτινες καὶ πραγματεύονται μετὰ τῶν Χερσωνιτῶν, καὶ ποιοῦσι τὰς δουλείας αὐτῶν τε καὶ τοῦ βασιλέως εἵς τε τὴν Ῥωσίαν καὶ Χαζαρίαν καὶ τὴν Ζιχίαν καὶ εἰς πάντα τὰ ἐκεῖθεν μέρη, δηλονότι λαμβάνοντες παρὰ τῶν Χερσωνιτῶν τὸν προσυμπεφωνημένον μισθὸν ὑπὲρ τῆς τοιαύτης διακονίας κατὰ τὸ ἀνῆκον τῆς δουλείας καὶ τοῦ κόπου αὐτῶν, οἷον βλαττία, πράνδια, χαρέρια, σημέντα, πέπερι, δερμάτια ἀληθινὰ Πάρθικα καὶ ἕτερα εἴδη τὰ ὑπ' αὐτῶν ἐπιζητούμενα, καθὼς ἂν ἕκαστος Χερσωνίτης ἕκαστον Πατζινακίτην πείσῃ συμφωνῶν ἢ πεισθῇ. Ἐλεύθεροι γὰρ ὄντες καὶ οἷον αὐτόνομοι οἱ τοιοῦτοι Πατζινακῖται οὐδεμίαν δουλείαν ἄνευ μισθοῦ ποιοῦσί ποτε.

Translation:

About the Pechenegs and the Chersonites. That another group of the Pechenegs is located near Cherson, who trade with the Chersonites and perform their tasks for them and the king towards Russia, Khazaria, Zichia, and all those regions, receiving from the Chersonites the agreed payment for such service according to the value of their work and effort, such as samite, silk cloths, silk, pepper, true Parthian leather, and other items they seek, as each Chersonite convinces or is convinced by each Pecheneg. For these Pechenegs, being free and autonomous, do not perform any labour without payment ever. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Gyula Moravcsik and James Heald Jenkins Romilly. *Constantine Porphyrogenitus De Administrando Imperio*. Dumbarton Oaks Center for Byzantine Studies, 1967.

Segment 9

Hesychius of Alexandria (fifth–sixth century), Alphabetical Collection of All Words

(525) Σῆρες· ζῷα νήθοντα μέταξαν. ἢ ὄνομα ἔθνους, ὅθεν ἔρχεται καὶ τὸ ὁλοσήρικον.

(526) σηρίον· θηρίον.

(527) σηρῶν· σκωλήκων τῶν γεννώντων τὰ σηρικά. σῆρες γὰρ οἱ σκώληκες.

(528) σής· σκώληξ ὁ ἐν τοῖς μελισσίοις γινόμενος καὶ ὑφάσμασι.

Translation:

(525) Seres: animals that spin silk. Or the name of a nation, from which the term "all-silk" originates.

(526) Serion: beast.

(527) Seron: worms that produce silk. Seres are the worms.

(528) Ses: worm that is found in beehives and in fabrics. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Moritz Schmidt, *Hesychii Alexandrini lexicon. Ed. minorem curavit M. Schmidt*, 1867; August Friedrich von Pauly, Georg Wissowa, Wilhelm Kroll, and Kurt Witte. *Paulys Real-Encyclopädie der classischen Altertumswissenschaft. 2. [i.e. Zweite] Reihe (R-Z)*. J.B. Metzler, 1937.

Segment 10

Theophrastus (ca. 371–287 BCE), Enquiry Into Plants

Ὡσαύτως δὲ καὶ τὸ συκάμινον· ἐκ στρυφνοῦ γὰρ ὀξὺ καὶ ἐξ ὀξέος γλυκὺ καὶ ἐπ’ ἄλλων δὲ τοῦτο συμβαίνει· τῆς γὰρ οἰνώδους γλυκύτητος ἐγγυτάτω κεῖται τὸ ὀξύ. Δι’ ὃ καὶ οἱ ἀποροῦντες δι’ ὅτι τὸ συκάμινον ἐρυθρὸν ὂν ὀξύτερόν ἐστιν ἢ λευκὸν ἐγγυτέρω τῆς πέψεως ὂν οὐκ ὀρθῶς ἀποροῦσι· τότε γὰρ οἷον γένεσίς ἐστιν αὐτοῦ τοῦ οἰκείου χυμοῦ. Λευκοῦ δ’ ὄντος ἡ στρυφνότης πλέον ἀπηρτημένη καὶ κοινοτέρα. Διὰ τοῦτο γὰρ καὶ ἐνταῦθα ὅταν ᾖ ξηρότερόν ἐστιν· ἐρυθραινόμενον δὲ ἐξυγραίνεται καθάπερ ἔγχυλον γινόμενον. Ὅλως γὰρ πᾶν τὸ περικάρπιον ξηρὸν τὸ πρῶτον ἀνυγραίνεται καὶ ἔστι γένεσις αὕτη τῶν χυλῶν ἐπιρρέοντος καὶ ὥσπερ διηθουμένου πλείονος ἀεὶ τοῦ ὑγροῦ καὶ ἀεὶ συναύξοντος ᾖ καὶ στρυφνὰ τὰ πολλὰ κατ’ ἀρχὰς οὐκ ἀλόγως.

Translation:

Similarly, the mulberry tree: from being unripe it becomes sour, and from sour it becomes sweet, and this happens in other cases as well: because the sweetness that has an oenological character is very close to sourness. That’s why those who wonder why the red berry, while red, is more sour than the white, which is closer to ripeness, wonder rightly; because then it is like the birth of the juice itself. When it is white, the unripeness is more intense and more common. Therefore, here too, when it is drier, it becomes red and moistened as if it were fermenting. Generally, every covering that is initially dry, moistens and this is the birth of the juices that flow and filter continuously and increase, just as many initially unripe things are not foolish. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

and

Theophrastus (ca. 371–287 BCE), Enquiry Into Plants

Ἐν Αἰγύπτῳ γάρ ἐστιν ἴδια δένδρα πλείω, ἥ τε συκάμινος καὶ ἡ περσέα καλουμένη καὶ ἡ βάλανος καὶ ἡ ἄκανθα καὶ ἕτερ’ ἄττα.

Translation:

In Egypt, there are more private trees, namely the mulberry tree, and the tree called the persian and the oak and the thorn and some more. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Friedrich Wimmer, *Theophrasti Eresii Opera quae supersunt omnia*. Vol. 1. Leipzig: B.G. Teubneri, 1854.

Segment 11

Athenaeus of Naucratis (second century), Deipnosophistae

‘συυκάμινα’· ὅτι πάντων ἁπλῶς οὕτω καλούντων αὐτὰ Ἀλεξανδρεῖς μόνοι ‘μόρα’ ὀνομάζουσι·. φέρει δὲ τὸν καρπὸν τοῦτον ἡ Αἰγυπτία συκάμινος ἀπὸ τοῦ ξύλου καὶ οὐκ ἀπὸ τῶν ἐπικαρπίων. ‘μόρα’ δὲ τὰ συκάμινα καὶ παρ’ Αἰσχύλωι ἐν Φρυξὶν ἐπὶ τοῦ Ἕκτορος· ἀνὴρ δ’ ἐκεῖνος ἦν πεπαίτερος μόρων’.

Translation:

Mulberries – that’s what everyone calls them, except the Alexandrians who call them “mora”; the Egyptian mulberry tree produces its fruit from its wood (trunk) and not from the bark.

“Mora” is also the term used for mulberries in Aeschylus’ “Phrygians” or “Hector’s Lyre”: “That man was more mature than mulberries. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

August Nauck, *Tragicorum Graecorum fragmenta*. In aedibus B.G. Teubneri, 1889; Wilhelm Herbst, *Galeni Pergameni de Atticissantium studiis testimonia collecta atque examinata: pars prima seorsum expressa*. Marburg: Academia Philippina Marpurgensi, 1910.

Segment 12

Constantine VII Porphyrogenitus (905–959), Geoponica

Λεύκη ἐγκεντρισθεῖσα ἢ ἐνοφθαλμισθεῖσα ἀπὸσυκαμίνου, συκάμινα λευκὰ φέρει. Συκάμινα δὲ ἐν ὑελίνῳ βικίῳ πλεῖστον διαμένει χρόνον. Φυτεύεται δὲ ἐν διτταῖς ὥραις, ἔν τε τῷ φθινοπώρῳ καὶ τῷ ἔαρι, μάλιστα δὲ ἀπὸ κλάδων, καθάπερ τὰ σῦκα. εὐαυξῆ δὲ γίνεται, σκαλλομένης τῆς περικειμένης αὐτοῖς γῆς συνεχῶς, μὴ κατὰ βάθος, ἀλλ' ἕως τῶν ἐπιπολῆς ῥιζῶν. Τὰ δὲ συκάμινα ἀπὸ σπέρματος δύναται φυτεύεσθαι, ἐάν τις αὐτὸ τὸ συκάμινον προδιαλύσας, καὶ τὰς κέγχρους αὐτοῦ ἐπιλεξάμενος, καταβάλῃ εἰς γῆν, καὶ ἀρδεύσῃ.

Translation:

White mulberry grafted or budded from a mulberry tree bears white mulberries. Mulberries can be preserved for a long time in a glass container. It is planted in two seasons, both in autumn and in spring, mostly from cuttings, just like mulberries. It grows well with continuous cultivation of the surrounding soil, not deeply, but only to the surface roots. Mulberries can also be planted from seed, if someone first breaks up the mulberry fruit, selects the seeds, sows them in the soil, and waters them. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

and

Ἡ συκῆ ἐνθεματίζεται εἰς συκάμινον καὶ εἰς πλάτανον. τὸ συκάμινον ἐνθεματίζεται εἰς κάστανον [...] καὶ εἰς λεύκην, ἀφ' ἧς γίνεται λευκὰ συκάμινα."

Translation:

The fig tree is grafted onto the mulberry tree and the sycamore tree. The mulberry tree is grafted onto the chestnut tree [...], from which white mulberries are produced if the tree produces white mulberries. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Cassianus Bassus, Geoponica *sive* De re rustica eclogae *[Gr.]*. In aedibus B. G. Teubneri, 1895.

Segment 13

Procopius of Caesarea (500–565), History of the Wars

Ὑπὸ τοῦτον τὸν χρόνον τῶν τινες μοναχῶν ἐξ Ἰνδῶν ἥκοντες, γνόντες τε ὡς Ἰουστινιανῷ βασιλεῖ διὰ σπουδῆς εἴη μηκέτι πρὸς Περσῶν τὴν μέταξαν ὠνεῖσθαι Ῥωμαίους, ἐς βασιλέα γενόμενοι οὕτω δὴ τὰ ἀμφὶ τῇ μετάξῃ διοικήσεσθαι ὡμολόγουν, ὡς μηκέτι Ῥωμαῖοι ἐκ Περσῶν τῶν σφίσι πολεμίων ἢ ἄλλου του ἔθνους τὸ ἐμπόλημα τοῦτο ποιήσωνται· χρόνου γὰρ κατατρῖψαι μῆκος ἐν χώρᾳ ὑπὲρ Ἰνδῶν ἔθνη τὰ πολλὰ οὔσῃ, ἥπερ Σηρίνδα ὀνομάζεται, ταύτῃ τε ἐς τὸ ἀκριβὲς ἐκμεμαθηκέναι ὁποίᾳ ποτὲ μηχανῇ γίνεσθαι τὴν μέταξαν ἐν γῇ τῇ Ῥωμαίων δυνατὰ εἴη. ἐνδελεχέστατα δὲ διερευνωμένῳ τῷ βασιλεῖ καὶ ἀναπυνθανομένῳ εἰ ὁ λόγος ἀληθὴς εἴη ἔφασκον οἱ μοναχοὶ σκώληκάς τινας τῆς μετάξης δημιουργοὺς εἶναι, τῆς φύσεως αὐτοῖς διδασκάλου τε οὔσης καὶ διηνεκῶς ἀναγκαζούσης ἐργάζεσθαι. ἀλλὰ τοὺς μὲν σκώληκας ἐνθάδε ζῶντας διακομίζειν ἀμήχανα εἶναι, τὸν δὲ αὐτῶν γόνον εὔπορόν τε καὶ ῥᾴδιον ὅλως. εἶναι δὲ τῶν σκωλήκων τῶνδε τὸν γόνον ᾠὰ ἑκάστου ἀνάριθμα. ταῦτα δὲ τὰ ᾠὰ χρόνῳ πολλῷ τῆς γονῆς ὕστερον κόπρῳ καλύψαντες ἄνθρωποι ταύτῃ τε διαρκῆ θερμήναντες χρόνον ζῷα ποιοῦσι. ταῦτα εἰπόντας ὁ βασιλεὺς μεγάλοις τοὺς ἄνδρας ἀγαθοῖς δωρήσασθαι ὁμολογήσας τῷ ἔργῳ πείθει ἐπιρρῶσαι τὸν λόγον. οἱ δὲ γενόμενοι ἐν Σηρίνδῃ αὖθις τά τε ᾠὰ μετήνεγκαν ἐς Βυζάντιον, ἐς σκώληκάς τε αὐτὰ τρόπῳ ᾧπερ ἐρρήθη μεταπεφυκέναι διαπραξάμενοι τρέφουσί τε συκαμίνου φύλλοις, καὶ ἀπ' αὐτοῦ γίνεσθαι μέταξαν τὸ λοιπὸν κατεστήσαντο ἐν Ῥωμαίων τῇ γῇ. τότε μὲν οὖν τά τε κατὰ τὸν πόλεμον πράγματα Ῥωμαίοις τε καὶ Πέρσαις καὶ τὰ ἀμφὶ μετάξῃ ταύτῃ πη ἔσχε. Μετὰ δὲ τὴν τοῦ χειμῶνος ὥραν ἀφικόμενος παρὰ Χοσρόην σὺν τοῖς χρήμασιν Ἰσδιγούσνας τὰ ξυγκείμενα σφίσιν ἐσήγγελλε. καὶ ὃς τὰ μὲν χρήματα κεκομισμένος τὴν ἐκεχειρίαν μελλήσει οὐδεμιᾷ ἐπεσφράγισε.

Translation:

Within the same year, some monks who had arrived from India, learning that Emperor Justinian was interested in stopping the Romans from buying silk from the Persians, appeared before the emperor and told him that they knew how to manage silk production so that the Romans could stop buying this commodity from the Persians, their enemies, or from other nations. They said they had spent a long time in a country located north of the numerous nations of India, called Serinda, and that there they had learned exactly how silk could be produced in the land of the Romans. The monks explained in detail to the emperor, who was studying the matter and trying to verify the truth of their statements, that the creators of silk were certain worms, and that their teacher was nature, which compelled them to work continuously. But they said it was impossible to transport the silkworms alive, whereas their eggs could be easily and successfully transported. They explained that each silkworm produces countless eggs. Each year, after these eggs are laid, people cover them with dung and keep them warm for a period, which produces new worms. After hearing this, the emperor promised great rewards to the men and encouraged them to prove their words with actions. They then returned to Serinda, immediately transported the eggs to Byzantium, and successfully raised silkworms, as described, feeding them with mulberry leaves. This established the production of silk in the Roman region. Meanwhile, war events occurred between the Romans and the Persians, and the matters of silk transpired in this way. After the winter period, Isdigousnes arrived at Khosrow with the money, informing him about the terms of the agreement, and they reached an accord. Khosrow, having received the money, confirmed the truce without delay. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Claudius Maltretus, *Procopius (of Caesarea.)*, 1833.

Segment 14

Photius I (ca. 815–893), Myriobiblon

Ὅτι τὴν τῶν σκωλήκων γένεσιν ἀνὴρ Πέρσης βασιλεύοντος Ἰουστινιανοῦ ἐν Βυζαντίῳ ὑπέδειξεν οὔπω πρότερον ἐγνωσμένην Ῥωμαίοις. Οὗτος δὲ ἐκ Σηρῶν ὁρμηθεὶς ὁ Πέρσης τὸ σπέρμα τῶν σκωλήκων ἐν νάρθηκι λαβὼν μέχρι Βυζαντίου διεσώσατο, καὶ τοῦ ἔαρος ἀρξαμένου ἐπὶ τὴν τροφὴν τῶν συκαμίνων φύλλων ἐπαφῆκε τὰ σπέρματα· τὰ δὲ τραφέντα τοῖς φύλλοις ἐπτεροφύησέ τε καὶ τἆλλα εἰργάσατο. Ὧν τήν τε γένεσιν καὶ τὴν ἐργασίαν ὁ βασιλεὺς Ἰουστῖνος ὕστερον τοῖς Τούρκοις ὑποδείξας ἐθάμβησεν. Οἱ γὰρ Τοῦρκοι τότε τά τε Σηρῶν ἐμπόρια καὶ τοὺς λιμένας κατεῖχον. Ταῦτα δὲ πρὶν μὲν Πέρσαι κατεῖχον, Ἐφθαλάνου δὲ τοῦ Ἐφθαλιτῶν βασιλέως, ἐξ οὗ καὶ τὸ γένος ἔσχε τὴν κλῆσιν, Περόζην καὶ Πέρσας νικήσαντος ἀφῃρέθησαν μὲν τούτων οἱ Πέρσαι, δεσπόται δὲ κατέστησαν Ἐφθαλῖται· οὓς μικρῷ ὕστερον μάχῃ νικήσαντες Τοῦρκοι ἀφεῖλον ἐξ αὐτῶν καὶ ταῦτα.

Translation:

This Persian, starting from the Seres, after planting the seed of silkworms in a cane, saved him until he reached Byzantium. And when spring started, he touched the seeds on the leaves of the mulberry tree to feed them; after they were fed on the leaves, they grew wings and developed further. King Justin later managed their cultivation and processing, impressing the Turks. The Turks then controlled the trade and ports of the Seres. The Persians had these before, under King Ephthalan, from the tribe of Ephthalites, from whom they also took their name, after defeating Peroz and the Persians. The Persians were deprived of these and the Ephthalites became masters. These, a little later, after the Turks defeated them in battle, also took them away. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Ludwig August Dindorf, *Historici Graeci minores*. In aedibus B. G. Teubneri, 1870.

Segment 15

Suda Lexicon (tenth century)

(336) Σῆρεςἔθνος, ἔνθα ἡ μέταξα γίνεται. ἐξ οὗ καὶ σηρικὰ τὰ ἐκ μετάξης ὑφασμένα λέγεται. καὶ Σήρ, σηρός, ἡ εὐθεῖα.

(337) Σηρική· ὅτι ἡ μέταξά ἐστιν, ἐξ ἧς εἰώθεσαν τὴν ἐσθῆτα ἐργάζεσθαι, ἣν πάλαι μὲν Ἕλληνες Μηδικὴν ἐκάλουν, τὰ δὲ νῦν σηρικὴν ὀνομάζουσιν. ἐπὶ δὲ Ἰουστινιανοῦ πρὸς Αἰθίοπας πρεσβεύονται Ῥωμαῖοι, ὅπως Αἰθίοπες ὠνούμενοι τὴν μέταξαν ἐξ Ἰνδῶν, ἀποδόμενοι δὲ αὐτὴν ἐς Ῥωμαίους, αὐτοὶ μὲν κύριοι γένωνται μεγάλων χρημάτων, Ῥωμαίοις δὲ τοῦτο ποιήσωσι κερδαίνειν μόνον, ὅτι δὴ οὐκέτι ἀναγκασθήσονται τὰ σφέτερα αὐτῶν χρήματα ἐς τοὺς πολεμίους μετενεγκεῖν. καὶ Σηρικὸν νῆμα, καὶ Σηρικὰ ἱμάτια.

(338) Σής, σητός: ὁ σκώληξ.

Translation:

(336) Seres: A nation where silk is produced. From this comes the word "serica" for the fabrics woven from silk. And Ser, seros, the straight.

(337) Serica: Because it is the silk from which they customarily make garments, which the Greeks formerly called Median, but now call serica. During the reign of Justinian, the Romans sent embassies to the Ethiopians, so that the Ethiopians would buy silk from the Indians and sell it to the Romans, thus making great profits, and the Romans would benefit only from this, as they would no longer be forced to give their money to their enemies. And Seric thread, and Seric garments.

(338) Ses, setos: The worm. (By Ioanna Tripoula, Panagiota Fragkou, and Skarlatos G. Dedos)

Immanuel Bekker, *Suidae lexicon ex recogn. I. Bekkeri*, 1854.

Segment 16

Theophylactus of Ochrid (1055–1107), Patrologiae Graeca

Εἰ εἴχετε πίστιν, καὶ ταύτην ἂν τὴν συκάμινον μετεφυτεύετε. Δύο δὲ ἐν ταὐτῷ τὰ μεγάλα, τό τε μετακινηθῆναι τὸ κατὰ γῆς ἐῤῥιζωμένον, καὶ τὸ ἐν τῇ θαλάσσῃ μεταφυτευθῆναι· ἐν ὕδατι γὰρ τί ἂν φυτευθείη; Δῆλον δὲ ὅτι διὰ τοῦ ταῦτα εἰπεῖν· τὴν τῆς πίστεως δείκνυσι δύναμιν. Τάχα δ' ἄν τις ἀλληγορῶν τὴν συκάμινον, εἴποι εἶναι τὸν διάβολον, ὡς τοῦ αἰωνίου σκώληκος πρόξενον ἡμῖν, καὶ τροφέα γινόμενον διὰ τῶν ἐξ αὐτοῦ φυομένων λογισμῶν, τῆς γὰρ συκαμίνου τὰ φύλλα σκώληκας τρέφουσι, δι' ὧν τὰ σηρικὰ νήματα γίνονται. Ταύτην οὖν τὴν συκάμινον ἡ πίστις δύναται ἐκριζῶσαι ἀπὸ καρδίας ἀνθρωπίνης, καὶ εἰς τὴν θάλασσαν βαλεῖν, τουτέστιν, εἰς τὴν ἄβυσσον ἀπολύσαι.

Translation:

If you have faith, you even transplant the mulberry tree itself. There are two significant things: to move what is rooted in the earth and transplant what is in the sea; for what could be planted in water? It is clear, therefore, that to say these things proves the power of faith. Perhaps someone speaking allegorically about the mulberry tree would say that it is the devil, as he who helps the eternal worm within us, and he who becomes a breeder because of the thoughts arising from it, the leaves of the mulberry tree nourish the worms, from which silk threads are made. Therefore, faith uproots this mulberry tree from the human heart and throws it into the sea, that is, it destroys it in the abyss. (By Ioanna Tripoula, Panagiota Fragkou, and Skarlatos G. Dedos)

Jacques-Paul Migne and Theodor Hopfner, *Patrologiae cursus completus, series graeca*, 1857.

Segment 17

Eustathius of Thessaloniki (ca. 1115–ca. 1195/6), Commentary on Dionysius Periegetes

Σημείωσαι δὲ οὖν ὅτι ἐξ ἀνθῶν οἱ Σῆρες ποιοῦσι τὰ ὕφη· διὸ οὐδὲ τοὺς λειμῶνας ἐῶσι καταβόσκεσθαι. Ὅτι δὲ ἀπροσμιγεῖς ἀνθρώποις εἰσὶ καὶ ἀνομίλητοι οἱ Σῆρες, δῆλον ἐκεῖθεν· τῶν πωλουμένων τὸ τίμημα σακκίοις ἐπιγράψαντες ὑποχωροῦσιν· εἶτα ἐλθόντες οἱ ἔμποροι καὶ θέντες τὴν τιμὴν ἀναχωροῦσιν, ἐφ' οἷς ἔρχονται οἱ Σῆρες, καὶ εἰ μὲν ἀρέσκονται, λαμβάνουσι τὴν τιμὴν, εἰ δὲ μή γε, τὰ ἴδια. Φασὶ δὲ μακροβιωτάτους εἶναι τοὺς Σῆρας, παρατείνοντας πέρα καὶ διακοσίων ἐτῶν. Σημείωσαι δὲ ὅτι ὅμοια τῇ ἱστορίᾳ τῶν Σηρῶν γίνεται καὶ ἔξω τῶν Ἡρακλείων στηλῶν. Ἔμποροι γὰρ ἐκεῖ ἀπὸ Καρχηδόνος ἐρχόμενοι καὶ τὰ φορτία ἐξελόντες

Translation:

Note that the Seres make their fabrics from flowers. Therefore, they do not allow their meadows to be grazed by animals. The fact that the Seres are isolated and do not associate with other people is evident from the following: in their transactions, they write the price of the goods being sold on sacks and withdraw. Then the merchants come, place the payment, and leave. Then the Seres come, and if they agree, they take the payment; if not, they leave their goods behind. It is said that the Seres live much longer than others, extending their lives beyond two hundred years. Note also that something similar to the transactions of the Seres happens beyond the Pillars of Hercules. There, merchants from Carthage come and take the goods. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Karl Müller, *Geographi Graeci minores*. Paris: A. Firmin-Didot, 1861.

Segment 18

Ioannis Tzetzes (1110–1180), Historiae

Πέρι σηρικών περιβλημάτων τπη′ Οἱ Σῆρες καὶ οἱ Τόχαροι, ἔθνη ἐγγὺς Ἰνδίας ὑφάσματα τὰ κάλλιστα ὑφαίνοντες ἁπάντων, καὶ τὰ πολυτιμότερα τοῖς παλαιοῖς τῶν χρόνων, καὶ Ἴβηρες ἐσπέριοι καὶ Κοραξοὶ ὁμοίως, ὑφάσματα τὰ κάλλιστα εἰσὶν ἐριουργοῦντες. Νῦν δὲ καταχρησάμενος ὡς οἱ πολλοὶ εἰρήκειν, τὸ ἐκ Θηβῶν, ἐκ Σηρικῶν, οὐκ ἀγνοῶν ὡς ἄλλοι.

Translation:

The Seres and the Tocharians, nations near India, weave the most beautiful and valuable fabrics of all for ancient times, and the Iberians are skilled weavers, as are the Coracians, producing the finest fabrics. But now, abusing as many say, the fabrics from Thebes and Seres, not being ignorant as the others. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

J. Tzetzes, *Ioannis Tzetzae Historiarum variarum Chiliades: Graece, textum ad fidem duorum codicum monacensium recognovit*. C. G. Vogelii, 1826.

Segment 19

Georgios Gemistos (ca. 1355/1360–1452/1454), A Geographical Treatise

Εἰ δὲ δεῖ τι καθ᾽ ἡμᾶς περὶ τῶν τῆς ἐγνωσμένης ἡμῖν οἰκουμένης περάτων ἀκριβέστερον Στράβωνος εἰπεῖν, πρὸς μὲν νότον ἡ Ἀγίσυμβα Αἰθιόπων χώρα ἱστόρηται ἐσχάτη, πρὸς ἕω δὲ Σῖναί τε καὶ Σῆρες, Σῖναι μὲν νοτιώτεροι Σηρῶν, Σῆρες δὲ Σινῶν βορειότεροι οἰκοῦντες. ἀλλὰ ταῦτα μὲν οὐ τῆς ἁπλῶς οἰκουμένης ἴσως, ἀλλὰ τῆς ἡμῖν ἐγνωσμένης εἴη ἂν ἔσχατα· οὐ γάρ πω ἴσμεν εἴτε οἰκήσιμα καὶ τὰ ἔτι προσωτέρω τούτων εἴτε καὶ μή· τὰ δ᾽ ἐξῆς ἤδη καὶ τῆς ἁπλῶς οἰκουμένης. πρὸς μὲν γὰρ βορᾶν ἥ τε Περμία χώρα ἐσχάτη ἐστὶ καὶ νῆσος ἡ Δάτεια, ὧν τὰ βορειότερα οὐκ ἔτι οἰκήσιμα· πρὸς ἑσπέραν δὲ καὶ κατ᾽ αὐτὸν Στράβωνα τὸ Ἱερὸν ἀκρωτήριον Ἰβηρίας δυσμικώτατον. αἱ γὰρ Μακάρων Νῆσοι διὰ τὸ δυσεπίμικτον ἡμῖν τε πρὸς ἐκείνους κἀκείνοις πρὸς ἡμᾶς οὐδ᾽ ἂν ἐν δίκῃ τι τῆς καθ᾽ ἡμᾶς οἰκουμένης μέρος εἶεν. τὸ δ᾽ Ἱερὸν τοῦτο ἄκρον κἂν στήλη τις τοῦ τῆς καθ᾽ ἡμᾶς εἴη οἰκουμένης δυσμικωτάτου πέρατος. οὐ γὰρ οὐδὲ περὶ τὸν Πορθμὸν

Translation:

If we must say something more precise about the ends of the known inhabited world according to us, in comparison with Strabo: to the south, the land of the Agisymba Ethiopians is recorded as the furthest; to the east, the Sinae and the Seres, with the Sinae being more to the south of the Seres, and the Seres living more to the north of the Sinae. However, these might not be the absolute ends of the inhabited world, but rather the furthest known to us; for we do not yet know whether there are habitable lands even further beyond or not. Next, the lands of the generally inhabited world: to the north, the Permian country and the island of Thule are the furthest, with the northernmost parts being uninhabitable. To the west, according to Strabo himself, the Sacred Cape of Iberia is the westernmost point. The Islands of the Blessed are not counted as part of our inhabited world due to the difficult access between us and them; thus, they are not considered part of our inhabited world. The Sacred Cape might be considered a pillar of the westernmost point

of our inhabited world. Not even around the Strait … (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Aubrey Diller, *Studies in Greek Manuscript Tradition*. Las Palmas: A. M. Hakkert, 1983.

Segment 20

Claudius Ptolemy (100–170 CE), Geographia

Οἱ Σῖναι περιορίζονται ἀπὸ μὲν ἄρκτων τῷ ἐκτεθειμένῳ μέρει τῆς Σηρικῆς,ἀπὸ δὲ ἀνατολῶν καὶ μεσημβρίας ἀγνώστῳ γῇ, ἀπὸ δὲ δύσεως τῇ ἐκτὸς Γάγγου Ἰνδικῇ κατὰ τὴν διωρισμένην μέχρι τοῦ Μεγάλου κόλπου γραμμὴν καὶ αὐτῷ τῷ Μεγάλῳ κόλπῳ καὶ τοῖς ἐφεξῆς αὐτῷ κειμένοις· τῷ τε καλουμένῳ Θηριῴδει καὶ τῷ τῶν Σινῶν, ὃν περιοικοῦσιν Ἰχθυοφάγοι Αἰθίοπες, κατὰ περιγραφὴν τοιαύτην·

Translation:

The Sinese are bounded on the north by the exposed part of Serica, on the east and south by unknown land, and on the west by the part of India beyond the Ganges, along the designated line up to the Great Gulf and the Great Gulf itself, and the regions adjacent to it; including the so-called Theriodes and the Sinic regions, which are inhabited by Ichthyophagous Ethiopians, described in such a manner. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Alfred Stückelberger and Gerd Graßhoff. *Klaudios Ptolemaios Handbuch der Geographie: griechisch-deutsch*. Basel: Schwabe, 2006.

Segment 21

Stephen of Byzantium (sixth century), The Ethnica

Σῖναι· μητρόπολις τῶν Σινῶν, περὶ ὧν φησι Μαρκιανὸς ἐν Περίπλοις

Translation:

Sinae: the metropolis of the Sinese, about which Marcianus speaks in Periploi. (By Ioanna Tripoula, Panagiota Fragkou, and Skarlatos G. Dedos)

Antonius Westermann, *Stephani Byzantii Ethnicon quae supersunt edidit Antonius Westermann*. Sumptibus et typis B. G. Teubneri, 1839.

Segment 22

John of Damascus (675/676–749), Exposition of the Orthodox Faith

Συρία κοίλη ιη Συρία Φοινίκη ιθ Συρία Παλαιστίνη κ Ἀραβία Πετραία κα Μεσοποταμία κβ Ἀραβία ἔρημος κγ Βαβυλωνία κδ Ἀσσυρία κε Σουσιανή κς Μηδία κζ Περσίς κη Παρθία κθ Καρμανία ἔρημος λ Καρμανία ἑτέρα λα Ἀραβία εὐδαίμων λβ Ὑρκανία λγ Μαργιανή λδ Βακτριανή λε Σογδιανή λς Σακῶν λζ Σκυθία ἡ ἐντὸς Ἰμάου ὄρους λη Σκυθία ἡ ἐκτὸς Ἰμάου ὄρους λθ Σηρική μ Ἀρεία μα Παροπανισάδαι μβ Δραγγιανή μγ Ἀραχωσία μδ Γεδρωσία με Ἰνδικὴ ἡ ἐντὸς Γάγγου τοῦ ποταμοῦ μς Ἰνδικὴ ἡ ἐκτὸς Γάγγου τοῦ ποταμοῦ μζ Σῖναι μη Ταπροβάνη νῆσος

Translation:

Coele-Syria 18, Phoenicia-Syria 19, Palestine-Syria 20, Arabia Petraea 21, Mesopotamia 22, Desert Arabia 23, Babylonia 24, Assyria 25, Susiana 26, Media 27, Persia 28, Parthia 29, Desert Carmania 30, Another Carmania 31, Arabia Felix 32, Hyrcania 33, Margiana 34, Bactria 35, Sogdiana 36, Sacae 37, Scythia within the Imaus mountain 38, Scythia beyond the Imaus mountain 39, Serica 40, Aria 41, Paropamisadae 42, Drangiana 43, Arachosia 44, Gedrosia 45, India within the Ganges River 46, India beyond the Ganges River 47, Sinae 48, Island of Taprobane 49 and distinguishes between Σῆρες and Σῖναι. (By Ioanna Tripoula, Panagiota Fragkou, and Skarlatos G. Dedos)

Bonifatius Kotter, *Die Schriften des Johannes von Damaskos*. Berlin: De Gruyter, 1973.

Segment 23

Michael of Ephesus (1050–1120), Commentary on Generation of Animals

Τὰ ἔρια λέγει νῦν καὶ τὴν καλουμένην ὑπὸ τῶν πολλῶν μέταξαν· σκώληκες γάρ τινες ταύτην τὴν μέταξαν γεννῶσιν. ἴσως δὲ οὐδὲν κωλύει τὴν τούτων γένεσιν ἱστορῆσαι. ζῷά τινα πτηνὰ ὀχεύουσιν ἄλληλα, τὰ ἄρρενα δηλαδὴ τὰ θήλεα, ἐκ δὲ τῆς τούτων ὀχείας γεννᾶται σκωληκώδη τινά, ἀναίσθητα μέντοι, ἃ δὴ συλλέξασαι αἱ περὶ τὴν μέταξαν πονοῦσαι γυναῖκες καὶ ὑπὸ τὸν κόλπον ἐμβιβάσασαι θερμαίνουσιν, ἕως ἂν αἴσθησιν λάβῃ καὶ ζῷα γένηται. ζῴων δὲ γεγονότων, τίθενται αὐτὰ εἰς κόσκινα καὶ διδόασιν ἐσθίειν φύλλα συκαμίνων, ἐξ ὧν φύλλων τρεφόμενα αὔξονται καὶ οὕτως ἐργάζονται τὸ κέλυφος κύκλῳ ἕκαστον αὐτῶν, καὶ ἔστι τὸ κέλυφος ὃ ἀναλύουσιν εἰς μέταξαν· εἶτα ἀποθνήσκει. καὶ μετὰ χρόνον τινὰ τοῦ κελύφους ῥαγέντος ἐξέρχεται ζῷον πτηνὸν ὅμοιον τῷ γεννήσαντι τὸν σκώληκα, καὶ τοῦτο ἀεὶ οὕτω γίνεται. πάλιν γὰρ ἐκ τοῦ πτηνοῦ τούτου γεννᾶται σκώληξ, ἐκ δὲ τούτου ἔριον κέλυφος καὶ πτηνόν, καὶ πάλιν ἐκ τοῦ πτηνοῦ τούτου σκώληξ, καὶ οὕτως ἀεί. καλεῖ δὲ τὰ πτηνὰ πεζά, οἶμαι, διὰ τὸ καὶ αὐτὰ τὸν πλείονα χρόνον πεζεύειν. εἰπὼν δὲ ὅτι καὶ τῶν μελιττῶν αἱ νύμφαι, ἐπήγαγε καὶ τοιοῦτον οὐδὲν ἔχουσιν, ὃ ταὐτόν ἐστι τῷ καὶ τροφὴν οὐδὲν λαμβάνουσι μετὰ τὸ γενέσθαι νύμφας. ἐν τῇ λέξει τῇ ὅθεν τρεφομένοις ἐπιγίνεται τοιοῦτον περίττωμα τὸ τοιοῦτον περίττωμα ἀντὶ τοῦ ἡ τροφὴ εἴρηται. ἔστι δὲ τὸ λεγόμενον ‘ὅθεν ἐπιγίνεται αὐτοῖς ἡ τροφὴ τρεφομένοις’. ζητήσειε δ’ ἄν τις, οἶμαι, καὶ ἐκ τῶν νῦν καὶ ἐκ τῶν μετὰ ταῦτα λεχθησομένων, πῶς εἰπὼν ὅτι ὅλος ὁ σκώληξ μεταβάλλει εἰς ζῷον καὶ τούτῳ διαφέρει ᾠοῦ, τῷ τὸ ᾠὸν μὴ ὅλον δύνασθαι εἰς ζῷον μεταβάλλειν, νῦν μὲν σκιωδῶς λέγει τὸ μέν τι αὐτοῦ ζῷον γίνεσθαι, τὸ δὲ μεταβάλλειν, νῦν μὲν σκιωδῶς λέγει τὸ μέν τι αὐτοῦ ζῷον γίνεσθαι, τὸ δὲ τροφήν (τοῦτο γὰρ δύναται τὸ οἱ μὲν ἔχουσιν ἐν ἑαυτοῖς τοιοῦτον, ἤτοι τροφήν), ἐφεξῆς δὲ καὶ λίαν σαφῶς ἐρεῖ τοῦτο. ἢ οὐ τοῦτο λέγει ὅτι ὅλος ὁ σκώληξ μεταβάλλει, ἀλλ’ ὅτι καὶ τὸ γεγονὸς τροφὴ ἠδύνατο ζῷον γεγονέναι, τοῦ δὲ ᾠοῦ τὸ γεγονὸς τροφὴ ζῷον γενέσθαι οὐ δύναται.

Translation:

(Aristotle) means the fabric that is now commonly called silk; some worms produce this silk. Perhaps nothing prevents us from narrating the creation of these. Some birds climb onto others, that is, the males onto the females, and from their mating, some worms are born. These worms are initially insensible, and the women involved in silk production collect them and warm them in their bosoms until they become sensible and turn into animals. Once they become animals, they are placed in sieves and fed mulberry leaves. After eating these leaves, they grow and create their cocoon, which is then processed into silk; afterwards, they die. After some time, the cocoon breaks, and a bird is born, similar to those from which the worm was born. This cycle repeats perpetually. That is, from this bird, a worm is born again, and so on. He calls the birds “walking” because, I think, they spend most of their time on the ground. Saying that even the larvae of bees [...] He concluded that they do not have something similar, which is the same with some [...] and that they do not take food once they become larvae. In the phrase “from where they are fed comes corresponding excrement”, the “corresponding excrement” is used instead of “the food”. It is possible to look for what is said, “from there comes the food for those that are fed”, I think, both from what is mentioned now and from what will be said later, from the way he says that the whole worm turns into an animal, and in this it differs from the egg, while the egg cannot entirely turn into an animal. Now he says that in the dark, some part of it becomes an animal, while another part becomes food. He will say this very clearly from now on. Indeed, he does not say that the whole worm changes, but that the animal created could become food; the animal created cannot become the food of the egg. (By Ioanna Tripoula, Panagiota Fragkou, and Skarlatos G. Dedos)

Michael, Hayduck and Hieronymus Vitelli. *Ioannis Philoponi (Michaelis Ephesii) in libros de generatione animalium commentaria*. Berlin: De Gruyter, 2013.

Segment 24

Manuel Philes (ca. 1275–1345), Two Poems about the Silkworm

(1) **Εις τον μεταξοποιόν σκώληκα**

Καὶ σηρικοῦ νήματος ὑφαίνειν λόγους (1)
τῇ φιλίᾳ δίδωσιν ἡ Κλωθὼ τύχη,
πλὴν ὡς ὑφαντὸν καὶ κροτόπλοκον τέρας
ἀμπίσχεται καὶ τοῦτο λαμπρῶς ἡ φύσις,
ὡς νυμφίον θέλγουσα τὸν φθόρον χρόνον. (5)
Ἐγὼ δ' ἐμαυτοῦ σωφρονέστερος μένω
ταλασίᾳ σκώληκος ἠσφαλισμένος,
εἰ σῶμα νωθρὸν καὶ περικεκλασμένον,
ἢ καὶ χαμερπὲς καὶ κατεστυγημένον,
τοσοῦτον ἔργον τῷ βίῳ χαρίζεται. (10)
Ἐκ γὰρ ἀπαγοῦς καὶ βραχυτάτου σπόρου
θαλφθέντος εἰς πῦρ, ἢ λινοῦν ὕφασμά τι,
ἢ διφθέρας ἔλυτρον, ἢ κόλπου ζέσιν,
ῥηγνυμένου πρόεισιν ἀμβλύς τις τόκος
ὡς κάρφος ἢ θριξ ἤ τι λεπτὸν ἐκτόπως, (15)
καὶ ζῇ καθ' αὑτὸν ἠρέμα κινούμενος,
καὶ βόσκεται τὰ φύλλα τῶν συκαμίνων,
τὸ τῆς τρύγης, βέλτιστε, μαστεύων γάλα.
Πλὴν ἀπολεπτύνουσι φειδοῖ τοῦ βρέφους
χεῖρες γυναικῶν τὴν τροφὴν τὴν φυλλίνην, (20)
ἐπεὶ τὸ παχὺ καὶ τραχὺ πρὸ τοῦ χρόνου
τοῖς χρωμένοις κίρνησιν οἰκτρὰν ἀγχόνην.
Ὅταν γε μὴν αὔξησιν ἡ φύσις λάβῃ,
δεῖται τροφῆς τὸ σῶμα δαψιλεστέρας.
Κεῖται δ' ἐπ' αὐτῆς ἀτρέμας τῆς θρύψεως, (25)
καρηβαριῶν ὑπὸ τῆς ἀπληστίας,
καὶ πᾶν τὸ σαπρὸν ταῖς τροφαῖς ἀποξύων,
δορᾶς νεαρᾶς ἐνδιδύσκεται σκέπην,
καὶ πάλιν αὐτὴν εἰ βραχὺς λύσει χρόνος
ἐκτείνεται γὰρ τῇ τροφῇ τὴν γαστέρα, (30)
ὥσπερ τις ἁβρὸς ἄλλο τι στολίζεται.
Πᾶσαν δὲ συντίθησι τὴν βρῶσιν κάτω,
τὸ μηκέτι χρήσιμον ἐκκρίνων μόνον·
ἂν δ' ἐκτραχυνθῇ τῆς χλιδῆς ἡ λεπτότης,
ὁ σὴς παρευθὺς τὰς τροφὰς ἀναπτύει (35)
καὶ τὰς ἀμοιβὰς τοῖς τροφεῦσιν ἐκτίνων
διαπλέκει τὸ νῆμα τῶν ἐντοσθίων·
καὶ βουκράνου κίνησιν ἑστῶτος φέρων
ταλασιουργεῖ καὶ στιβάζει τοῦς μίτους.
Πλὴν ἀλλ' ἴδε στράτευμα συχνὸν ἐνθάδε, (40)
καὶ τὴν φυσικὴν τακτικὴν μὴ φαυλίσῃς·
οἱ γὰρ φάγοι σκώληκες, οὓς πρὶν ἐσκόπεις
νωθεῖς ἀτεχνῶς καὶ βραδεῖς καὶ δυσκόλους,
σοβοῦσι καὶ βομβοῦσι ταγμάτων τρόπον,
εἰς τὰς κόμας τρέχοντες ἁβρῶς τῶν κλάδων. (45)
Ποιεῖ γὰρ αὐτοὺς ἀντὶ βάθρων ὁ χρόνος
τῇ καταγωγῇ τοῦ στρατοῦ πεπηγμένους·
καί τις ἐπ' αὐτοὺς ἡγεμὼν τεταγμένος
πρὸ τοῦ στίφους ἄνεισι καὶ βλέπει κάτω,
καὶ τὴν τελευτὴν ταῖς φυλαῖς ἐπιτρέπει· (50)

τούτων δὲ σὴς ἕκαστος εὐθὺς ἐκπτύων
τὴν καταγωγὴν ὀργανοῖ τὴν ἐσχάτην.
Ἡ σύνθεσις γὰρ τῶν πολυστρόφων μίτων
σφαῖρα προμήκης τῷ πλέκοντι γίγνεται.
Χαίρει δὲ τοῖς τέρπουσιν ὁ σκώληξ μύροις, (55)
καὶ τοὺς βαρεῖς ἄνωθεν οὐ στέγει ψόφους·
αἱρεῖ γὰρ αὐτὸν καὶ ψιλὴ δυσοδμία,
καὶ μῦς λαθὼν καὶ πνεῦμα καὶ βροντῆς κτύπος.
Θνήσκει δὲ τοῦ κλάοντος οὐκ ὄντος γένους,
κλεισθεὶς ἐν αὐτῇ τῆς πλοκῆς τῇ συνθέσει. (60)
Μετὰ χρόνον δέ τινα παπαὶ τοῦ ξένου
ζῷον πτερωτὸν ἐκ ταφῆς ἀνηγμένος
τὴν τοῦ γένους ἔγερσιν ἡμῖν δεικνύει·
καὶ γὰρ ὁ νεκρὸς καὶ τεταριχευμένος
εἰς δεύτερον φῶς εὐπρεπῶς ἀνατρέχει. (65)
Τούτου γε μὴν, Ἥρακλες, Ἑρμῆ, τὸν τάφον
χαυνοῖ τὰ θερμὰ τοῦ λέβητος ὕδατα,
καὶ σφαῖρα καὶ χεὶρ καὶ βραχὺ τμῆμα κλάδου,
πυκναῖς ἀκανθῶν ἐξοχαῖς πεφυρμένον,
τοὺς δυσπλόκους λύουσιν εὐτέχνως μίτους· (70)
καὶ γίγνεται τὸ πλέγμα τοῦ θνησειδίου
χιτὼν ἀτεχνῶς καὶ βασιλεῦσι πρέπων.
Οὐδὲν γὰρ εἰκῇ συμπαρήχθη τῇ κτίσει,
ἂν καὶ τὰ φαυλότατα σωφρόνως βλέπῃς.
Σκώληξ μὲν οὖν ὄνειδος ἀνθρώπων γίνου, (75)
τῷ μετρίῳ σχήματι σαυτὸν σεμνύνων·
ἑλοῦ δὲ τὸν τραχύν τε καὶ σκληρὸν βίον,
τοῖς τοῦ λόγου βρώμασι τὸ πνεῦμα τρέφων.
Ἐπὶ δὲ τοῖς τεκοῦσι μὴ φρόνει μέγα·
σκώληξ γὰρ αὐτόματος οὐ κυΐσκεται· (80)
ὅταν δὲ καλῶς ὀργανωθῇς τῷ χρόνῳ,
τῆς ἀρετῆς τὸν οἶκον εὐτρέπιζέ μοι,
καὶ θνῆσκε νεκρῶν τῶν μελῶν σου τὸν τόνον,
ὡς ἂν λάβῃς πτέρωσιν οὐρανοδρόμον,
ὁ δὲ χρόνος τὸ νῆμα τῆς μνήμης φέρων (85)
τὸ τῶν κρότων ὕφασμα λαμπρῶς σοι πλέκῃ.
Ἐμοὶ δὲ νυνὶ τὸν καλὸν πέπλον δίδου,
λαβὼν ἀπ' αὐτῶν εὐλαβῶς τῶν διπτύχων,
καὶ ῥᾳδίως πέραινε τὰς ὑποσχέσεις.
Οὐ γὰρ ἐπαινῶ τὰς ῥεούσας ἐλπίδας, (90)
ἃς πολλάκις ἥρπασεν ὡς κλὼψ ὁ χρόνος.
Ἔστω δὲ μαλθακός τις, ὦ ξένη φύσις,
ἀφ' ἑστίας ὅ φασιν ἐξειργασμένος·
οἱ γὰρ παραπλέκοντες ὀθνείους μίτους
εἰς τὰς ἀγωγὰς τῆς ὑφιστώσης κρόκης (95)
ὠνητὸν ἠσπάσαντο καὶ φαῦλον βίον,
ὁρῶντες εἰς τὸ κέρμα τῶν πλανωμένων.
Σὺ δὲ στιβαρὰν εὐτυχῶν τὴν καρδίαν
καὶ παντὸς ὢν ἄγευστος, εἰ καί τις, δόλου,
δώσεις καθαρὰν ἥνπερ ὑπέστης χάριν. (100)
Σπόρος τίς ἐστιν ἐξ ἰπῶν ὑποπτέρων,
βραχὺς, ἀπαλὸς, ἐμβριθὴς, γλισχρὸς, μέλας,
ὃς δὴ ψυχῆς δύναμιν ὑπνοῦσαν φέρει.

Translation:

(1) **For the silk-producing worm**

And so the silk thread of speech may be woven, allowed by fate, the weaver of friendship, but like a fabric and a marvel combined with the strike (of a shovel) it is also surrounded by brilliance by nature, as it enchants time, the bridegroom that decays. I remain more prudent than myself, having secured the treatment of the worm, while the body is sluggish and bent or even lowly and hateful, so much work it offers to life. For from a young and short-lived seed, nurtured by fire or some linen cloth or in a leather covering, or in the warmth of a bosom, and once it has opened, a delicate offspring emerges like a pin or hair or something thin and long, and it lives on its own, moving quietly, and feeds on mulberry leaves, seeking the milk of the mature fruit, better, but let them thin out, to save the small one, the hands of the women with the leafy food, because when it is thick and rough before the (appointed) time, to those who use it, it brings a sad suffocation. When nature does not allow further growth, the body needs more food, then it sits still on the same softness, weighed down by gluttony, and scratching away anything rotten from the food, it dresses in a cover of new skin, and again if time dissolves this (because the belly grows with food), like someone delicate, it adorns itself with something else. It creates all the food below, excreting what is no longer useful; if the softness of the luxurious food hardens, the silkworm immediately spits out the food, and compensating the breeders, it weaves the thread from its entrails; and taking the movement of the bull's head when standing, it spins threads and piles up fibres. But now look at the dense army, and do not underestimate their natural ability to line up for battle; the voracious worms, that you saw earlier, sluggish, unskilled, slow-moving, and hard to satisfy with food, slowly evolve and make noise like battalions, running gracefully on the leaves of branches. Instead of ladders, it constructs these which are made with the organization of an army; and someone appointed as their leader climbs in front of the crowd and looks down, and allows death to the tribes; from these each worm immediately after vomiting (the threads) arranges the last resting place. The composition of the threads with many turns is made by this one weaving an elongated sphere. The worm delights in pleasant resins, and cannot tolerate the loud noises from above, even a slight unpleasant smell destroys it, and an unnoticed mouse, a puff of air, or the noise of thunder. It dies without being of a weeping kind, after being enclosed in this woven composition. After some time (woe to the stranger), a winged creature born from the tomb shows us the resurrection of its kind. For the one who has died and been embalmed decently goes into a second light. Certainly, for him, Hercules, Hermes, his tomb is softened by the warm waters of the cauldron, and a sphere, and a hand, and a small piece of branch mixed with dense thorny projections artfully unravel the tangled threads; and the weave that comes from the dead body becomes a simple tunic, fit for a king. For nothing was created along with the acquisition if you do not see even the very lowly with prudence. Worm, thus become the fame of men in a modest manner, so I may honour you; prefer the rough and hard life, nourishing the spirit with the food of speech. Do not boast for those who give birth, for a worm does not fertilize itself; when you are properly formed over time, adorn the house of virtue for my sake, and die, destroying the nerves of your limbs, as if you were taking wings that lead to the sky, time bringing the thread of memory, brilliantly weaves the fabric of applause for you. Now give me the good veil, taking it reverently from the folded ones, and easily fulfil the promises. For I do not praise the hopes that are uncertain, which many times time snatched like a thief. Be someone gentle, beloved nature, from the hearth, as they say, constructed; for those who weave strange threads, in the patterns formed by the existing weave, preferred a purchased and bad life, seeing the whole of the deceived. You who were fortunate to have a strong heart and have not tasted any deceit, if there is any, you will give pure grace, if indeed you have accepted it. There is some seed from the winged worms, small, soft, compact, sticky, dark-coloured, which carries within it the dormant power of the soul. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

2) Περι σηροσκώληκος

Ὅταν πυρωθῇ, ῥήγνυσι μὲν τὸν τόκον, (4)
ποιεῖ δὲ νωθρὸν ἐκλεπισθὲν τὸ βρέφος· (5)
ὃ καὶ τρέφει τὰ φύλλα τῶν συκαμίνων
πρὸς τὴν ἐπιπρέπουσαν ἀκμὴν τῷ χρόνῳ·
παχύνεται δὲ τοῖς ὀποῖς τοῖς ἐμφύτοις,
οἳ δρῶσιν ἁδρὰν καὶ προμήκη τὴν πλάσιν,
εἰς εὐτόμους ἕλικας ἐσπειραμένην. (10)
Τῆς γὰρ κεφαλῆς ἠρέμα κινουμένης
πρὸς τὴν ποθεινὴν συλλογὴν τῆς βρώσεως,
κεῖται τὸ κάτω σῶμα καθάπερ λίθος,
τὰ τῆς ὕλης ἄδηλα συλλέγον βάρη.
Ὅταν δὲ καὶ τὸ φύλλον, ὁ τρέφει τέως, (15)
ἀποτραχυνθῇ τῇ παρακμῇ τοῦ χρόνου,
καὶ τῆς χλιδῆς τὸ σῶμα τῷ κόρῳ βλύσῃ,
ὁ τρὼξ ὁ νωθὴς τοὺς χυμοὺς ἀναπτύει
καὶ τὴν κεφαλὴν ὡς ἀπὸ κάρου στρέφει·
τὸ λεπτὸν ἀπόσφαγμα συνδεῖ τοῖς κλάδοις, (20)
καὶ γίνεται τὸ νῆμα σῆμά τι ξένον
καταπιληθὲν τῆς πλοκῆς τῇ συνθέσει,
ἐν ᾗ παρευθὺς ἀποληφθεὶς ἐκπνέει·
καὶ πάλιν εἰς φῶς ἐκ ταφῆς ἀνατρέχει,
πτεροῖς ἑαυτὸν ὁ φθαρεὶς καθοπλίσας. (25)
Ἐξίπταται γὰρ τοῦ καθ' αὑτὸν θριγγίου,
καὶ δημιουργεῖ τῷ τροφεῖ νέους σπόρους,
ἄλλῳ συναφθεὶς ἐκ πυγῆς ὑποπτέρῳ.
Ὁ δ' ὑπολειφθεὶς τοῦ παλιμβίου δόμος
ἀναλυτικοῖς ἐξυφαίνεται στρόφοις· (30)
χαυνοῖ γὰρ αὐτῷ τοὺς πιληθέντας μίτους
ἐπ' ἀνθράκων νήματος ὑπτία ζέσις.
Κἀντεῦθεν ἡμῖν ἡδέως ὑφαίνεται
πέπλος καθαρὸς τεχνικῶς νενησμένος,
μᾶλλον δὲ καὶ παίδευμα σωφρόνως ἔχον, (35)
ᾧ τὸν περιττὸν ἀποκοσμοῦμεν τύφον,
ταλασίᾳ σκώληκος ἐγκοσμούμενοι.
Οὐκοῦν προσηνῶς τόνδε τὸν πέπλον δίδου,
χιτὼν λογικὲ πρακτικῆς ἱστουργίας,
καὶ τῶν ὅλων ἄριστε κοσμῆτορ φύλων. (40)
Περιστελεῖς γὰρ ἄνδρα γενναῖον φίλον,
ὃν οὗτος ὁ κλὼψ ἀπεγύμνωσε χρόνος,
ὢν ὑπολῃστὴς τῷ φθορεῖ πάντων φθόρῳ.

Translation:

(2) **About the silkworm**

When warmed by the fire, it releases the newborn, making the baby sluggish as it emerges from its cocoon, which it then feeds with mulberry leaves towards the full bloom that comes with time. It gains weight with the juices present, which make the body bulky and elongated, surrounded by fissile rings. And while the head moves gently towards the desired collection of food, the lower body lies down just like a stone, gathering the hidden weights of matter. When the leaf, which it feeds on until then, hardens with the passage of time, and the body fills with softness and saturation, the sluggish worm spits out the juices and turns its head as if weighed down by sleep. The thin silk connects with the branches and the thread becomes a foreign tomb, compressed for the fabric's construction with the weaving composition, in which, immediately after being

enclosed, it expires. And once again, it returns to light from the tomb, equipping itself with wings, the one who had decayed. It flies over its obstacle, creating new seeds for the one who is fed, after mating with another from the back under the wings. This one, remaining to revive the home, is woven to the end with loosened twisted fabrics, thus relaxing the threads that are crushed, boiled with the back down into cinnabar threads. And from then on, it is beautifully woven for us, a clean veil woven with skill, which has more learning/students with prudence, with which we remove the excess bulk, putting in order the spinning of the worm. Therefore, with gentleness, give this veil, the logical tunic of the practical art of weaving, excellent leader of all kinds. Because you surround a man who is a brave friend, whom this thief, time, has stripped bare, who, while being a thief, destroys everyone with ruin. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Friedrich Dübner and Franz Siegfried Lehrs. *Manuelis Philae versus iambici de proprietate animalium, Poetae bucolici et didactici*. Paris: Didot, 1862.

Segment 25

Corpus Juris Civilis (or Code of Justinian) (530)

ΠΕΡΙ ΜΕΤΑΞΗΣ: Χρὴ τὴν μέταξον τοὺς κομμερκιαρίους πρὸς τοὺς βαρβάρους πραγματεύεσθαι ιε′ νομίσμασι τὴν λίτραν καὶ μεταπωλεῖν τοῖς μεταξαρίοις ἢ τοῖς ἄλλοις οὐ πλέον καθαρὰν δίχα σφηκώματος ἢ ἄλλης προσθήκης ἢ ῥύπου. Εἰ δέ τις πρὸς βαρβάρους μὴ ὢν κομμερκιάριος πραγματεύσηταί τι καὶ μέταξον ἐκεῖθεν ἀγάγῃ, δύναται αὐτὴν ἀφαιρεῖσθαι ὁ κομμερκιάριος, καὶ ὁ πραγματευσάμενος δημεύεται καὶ διηνεκῶς ἐξορίζεται. Εἰ δὲ ὁ κομμερκιάριος ἢ ὁ μεταξάριος ὑπὲρ τὸ ῥηθὲν ποσὸν πωλήσῃ ἢ ἀγοράσῃ, ὁμοίως τιμωρεῖται. Χρὴ δὲ τοὺς πραγματευτὰς τῶν τοιούτων ἐγγύας διδόναι τῇ πολιαρχίᾳ, ὡς οὐ πωλοῦσι κρύφα ἀλλὰ δημοσίᾳ πᾶσαν ἣν ἔχουσι πραγματείαν· ἐπεὶ τιμωροῦνται. Χρὴ δὲ κατὰ ταῦτα λογίζεσθαι τῷ δημοσίῳ τὴν τιμὴν παντὸς τοῦ ὁλοσηρίκου παρὰ τοῦ κόμητος τῶν λαργιτιόνων τοῦ διδομένου παρ’ αὐτοῦ τῷ δημοσίῳ. Ὁ δὲ ἀγοράσας ὑπὲρ τὸ ταχθὲν ἀναγκαζόμενος δοῦναι προσαγγέλλει τῷ πράτῃ καὶ τὸ διπλοῦν ἀναπράττει· λοιπὸν γὰρ ὁ πράτης τὰ λεχθέντα πείσεται.

Translation:

ABOUT SILK: The silk must be traded by the commercers with the barbarians at 15 coins per pound and resold to the silk merchants or others not exceeding that amount, pure without any addition or impurity. If someone trades with the barbarians without being a commercer and brings silk from there, the commercer can confiscate it, and the one who made the trade will be confiscated and exiled forever. If the commercer or the silk merchant sells or buys for more than the specified amount, they will be punished in the same way. Those who trade in such goods must provide guarantees to the city authorities that they will not sell secretly but publicly all the merchandise they have; otherwise, they will be punished. The price of any full-silk garment provided by the count of the *largitiones* should be calculated for the public treasury. The one who bought and was forced to pay more than the set amount should report it to the trader and collect double; henceforth, the trader will suffer the mentioned penalties. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Theodor Mommsen, Paulus Krueger and Rudolphus Schoell. *Corpus juris civilis*. Apud Weidmannos, 1895.

Segment 26

Euthymius Zigabenus (twelfth century), Commentaria in quattuor evangelia

Τελῶναι δέ εἰσιν, οἱ φορολόγοι καὶ οἱ κομμερκιάριοι. Σφόδρα δὲ διεβάλλοντο τὰ τοιαῦτα ἐπιτηδεύματα, ὡς ἄδικα καὶ πλεονεκτικὰ καὶ ἀσυμπαθῆ

Translation:

Tax collectors and customs officers are the tax collectors and commercers. These professions were strongly criticized as unjust, greedy and unsympathetic. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos).

Jacques-Paul Migne and Theodor Hopfner. *Patrologiae cursus completus, series graeca*, 1857.

Segment 27

Ducas (fifteenth century), Historia Turcobyzantina

Αὐτὸς οὖν τὸν χειμῶνα ἐν Ἀδριανουπόλει καὶ Κωσταντινουπόλει διῆγεν πήξας ναῦν ὑπερμεγέθη καὶ δομήσας θέατρον ἐν τῇ Πόλει ὃ καὶ βεστιοπρατήριον λέγεται καὶ Περσιστὶ πεζεστάνιον ὀνομάζεται.

Translation:

He therefore spent the winter in Adrianople and Constantinople, constructing an enormous ship and building a theatre in the City, which is also called a cloth market and in Persian is named *pezhestan*. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos).

Doukas. *Istoria turco-bizantină (1341–1462)*. Edited by V. Grecu. Bucharest: Editura Academiei Republicii Populaire Române, 1958.

Segment 28

Isidorus Glabas (1341/32–1360), Homiliae

Καὶ πᾶσα μὲν ἄλλη μέθοδος ἐπί τι χρήσιμον ἄγουσα τὸν διδασκόμενον ἢ δαπάνης δεῖται, ὀργάνων τε ἕνεκεν τῶν ὑπὲρ ἐκείνης καὶ διὰ τοὺς παιδευτάς, ἢ πόνου καὶ χρόνου μακροῦ, ὡς ἂν ἀρκούντως ἐκπαιδεύσῃ τὸν γυμναζόμενον. Οὕτω τεκτονική, χαλκευτική, σκυτοτομική, βεστιοπρατικὴ καὶ εἴ τις ἄλλη τῶν τεχνῶν ἢ χειρὸς δεομένη, ἢ γλώττης καὶ βίβλωνή δὲ περὶ τῆς τῶν ἁμαρτημάτων ἀφέσεως μεταχείρησις ἀδάπανος, ἄπονος, οὐ διὰ πολλοῦ τοῦ χρόνου κατορθοῦσα τὸ σπουδαζόμενον· ἀλλ᾽ ἅμα τε ὁ μαθητὴς εἰς τὴν τῆς ἐπιστήμης ταύτης ἐκάθισε μύησιν, καὶ τάχιστα εὐθὺς τεχνικὸν καὶ ἄπταιστον ἀπετέλεσε τὸ συμπέρασμα.

Translation:

And every other method that leads the learner to something useful requires either expense, due to the instruments used for it and for the trainers, or great effort and time to sufficiently educate the trainee. Thus, the art of construction (architecture), the art of bronze working, the art of leather working, the art of clothing making, and any other of the arts that require either hands, or language or books; the handling of the forgiveness of sins does not require expenses, effort, achieving to complete the studies successfully in a short time; but if the student attended the initiation into this science, he was led very quickly to a skilful and resilient outcome (not prone) to errors. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos).

Venizelos Christophorides, *Isidore Glava, Archbishop of Thessaloniki, Speeches Vol. 1*. Thessaloniki: P. Pournaras 1966.

Segment 29

Constantine VII Porphyrogenitus (905–959), De cerimoniis aulae Byzantinae

οἵ τε βεστιοπράται καὶ ἀργυροπράται διά τε βλαττίων καὶ λοιπῶν ἐντίμων ἁπλωμάτων τε καὶ πέπλων, καὶ μὴν διά τε χρυσῶν καὶ ἀργυρῶν παντοίων σκευῶν τοῦτο καταγλαΐζουσιν

Translation:

Those who trade in fabrics and silver because of the luxurious silks and other precious coverings and fabrics, and especially because of the gold and silver and every such kind of objects, this is what they glorify. (By Ioanna Tripoula, Panagiota Fragkou, and Skarlatos G. Dedos).

Constantin VII, Porphyrogénète, Albert Vogt and Guillaume Budé. *Constantin VII Porphyrogénète. Le Livre des cérémonies, Byzantine publiée sous le patronage de L'association Guillaume Budé*. Paris: Société d'édition "Les Belles lettres," 1935.

Segment 30

Eustathios Romaios (975–1034), Nomograph

Ὅτι σωματεῖον καὶ σύστημα διαφέρει. σωματεῖον μὲν γὰρ ἐστὶ πᾶσα τέχνη, ἥτις διὰ χειρὸς ἔχει τὴν ἐργασίαν· οἷον σκυτοτομικὴ ἢ βαπτική. σύστημα δὲ ἡ μὴ ἔχουσα διὰ χειρῶν τὴν ἐργασίαν, οἷον οἱ πρανδιοπράται καὶ οἱ μεταξοπράται καὶ οἱ λοιποί, οἵτινες αὐτοὶ οὐκ ἐργάζονται.

Translation:

That the guild and the system differ. The guild is every craft that relies on manual labour; such as the craft of leatherworking or dyeing. The system is the craft that does not rely on manual labour, such as the garment merchants and the silk merchants and the rest, who do not work themselves. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos).

Karl Eduard Zachariae von Lingenthal, *Jus Graeco-Romanum: Practica ex actis Eustathii Romani*. Nuremberg: Weigel, 1856.

Segment 31

Ioannis Apokaukos (ca. 1155–1233), Letters (dated 1217/1218)

ἡμεῖς δέ, εἰ καὶ μὴ τοῖς ἀπὸ τούτου θερμοτέρας αἰσθήσεως ἐλάβομεν πεῖραν, τέως μετέσχομεν τοῦ καπνοῦ. πρὸ καιροῦ γὰρ πειρατικοὶ φυγάδες ἡμέτεροι προσχωρήσαντες τοῖς κατὰ Πάτραν Λατίνοις, ἐπεὶ ὁ στόλος παρήρχετο τὰ ἡμέτερα, θάῤῥος οἱ φυγάδες λαβόντες, μετὰ τῶν πειρατικῶν λεμβαδίων τῇ Ναυπάκτῳ προσώκειλαν καὶ πῦρ ἀνῆψαν κατὰ πάσης τῆς πόλεως. καλυβῖται δὲ οἱ ἐμοὶ πολῖται, καὶ χόρτος τούτοις αἱ κέραμοι, ὕλη ξηρὰ μὲν τῷ χρόνῳ, εὔπρηστος δὲ πυρὶ πλησιάζουσα· καὶ ἐταλαιπωρήσαμεν καὶ κατεκαύθημεν ἕως τέλους. οὐχ ὑπελείφθη ἄκαυστον δένδρον, οἱ μεταξογεννήτορες σκώληκες αὐταῖς καλύβαις ἀπώλοντο, τὰ λήϊα καταπεπάτηνται καὶ μησὶ μᾶλλον ἢ δράγμασι γνωρίζεται τὸ θέρος ἡμῶν.

Translation:

And although we did not gain a stronger sense from this, we nevertheless shared in the smoke. Before the time, our pirate fugitives who joined the Latins in Patras, when the fleet was passing by our land, the fugitives took courage, and with the pirate boats they reached Nafpaktos and set fire to the whole city. My citizens were hut-dwellers, and for them, the tiles were like grass, dry material over time, easily ignited by fire; and we suffered and burned until the end. Not a single tree was left unburnt, the silkworms in the huts perished, the harvest was destroyed, and our summer is known more for the months than for the sheaves. (By Ioanna Tripoula, Panagiota Fragkou and Skarlatos G. Dedos)

Nikos Bees. "Unedierte Schriftstücke aus der Kanzlei des Johannes Apokaukos des Metropoliten von Naupaktos (in Aetolien)." In *Byzantinisch-neugriechische Jahrbücher* (1974): 57–160.

Segment 32

Ioannis Apokaukos (ca. 1155–1233), Letter (dated 1212/1213)

ἐνδεχομένην φιλοφροσύνην διπλώσας δύο σοι διπλάρια ἑξάμιτα πέπομφα, τὸ μὲν κόκκινον προσνείμας τῇ πανηγύρει, βασιλὶς γὰρ αὕτη τῶν ἑορτῶν καὶ σὺ βασιλεὺς ἡμέτερος, βασιλικὸν δὲ ἄμφιον καὶ τὸ κόκκινον· τὸ δέ γε κιρρὸν τῇ νόσῳ καὶ τῇ νηστείᾳ, ὠχροὶ γὰρ γινόμεθα καὶ ἐγκρατευόμενοι καὶ νοσοῦντες.

Translation:

Doubling the expected courtesy, I have sent you two double cloaks of six threads, the red one dedicated to the feast, for it is the queen of festivals and you are our king, and the royal garment is the red one. The yellow one for illness and fasting, for we become pale both when we practise temperance and when we are ill. (By Ioanna Tripoula, Panagiota Fragkou, and Skarlatos G. Dedos)

Sophrone Pétridès, "Jean Apokaukos, Lettres et autres documents inédits." *Izvestija Russkago Archeologiceskago Instituta v Konstantinopole* 14 (1909): 72–100.

Segment 33

Nicetas Choniatis (ca. 1155–1217), Historia

τὰς ἐν μέσῳ κωμοπόλεις ὁδοῦ πάρεργον ληϊσάμενος ταῖς ἑπταπύλοις Θήβαις προσέβαλεν, ὧν καὶ γενόμενος ἐγκρατὴς ἀπανθρώπως τοῖς ἐκεῖ προσηνέχθη. κατὰ γὰρ παλαιὰν φήμην τῆς πόλεως ὡς πλουσίους τρεφούσης οἰκήτορας, εἰς χρημάτων ἀπληστίαν ὑπονυττόμενος καὶ μηδένα κόρον φιλοπλουτίας εἰδώς, ἀλλ᾽ ὅρον τιθεὶς τῆς ἐφέσεως τὸ καὶ εἰς τρίτον ζωστῆρα τῇ ὁλκῇ τῶν χρημάτων τὰς πάσας ἢ τὰς πλείους νῆας βαπτίζεσθαι, τούς τε χειρώνακτας ἐξεπίεσε καὶ περὶ τοῦ ῥύπου τῶν ὀβολῶν πολυπράγμων γινόμενος τοὺς δυνατοὺς καὶ λαμπροὺς τὸ γένος καὶ σεμνοὺς τὴν ἡλικίαν καὶ περιφανεῖς κατ᾽ ἀξίωσιν διαφόροις κακώσεσι καθυπέβαλε, μηδενὸς λαμβάνων αἰδὼ καὶ φειδώ, μὴ δυσωπούμενος τὴν δυσώπησιν, μὴ τὴν Ἀδράστειαν εὐλαβούμενος αὐτοῦ που λαβοῦσαν ἀρχὴν ἢ τὴν Καδμείαν λεγομένην νίκην ὑποβλεπόμενος. τέλος δὲ τὰ ἱερὰ προθεὶς γράμματα ἠνάγκαζεν ἕκαστον, τὴν ὀσφὺν ὑπεζωσμένον εἰσιόντα, τὴν οἰκείαν οὐσίαν οἷς ἐνθεωρεῖται μεθ᾽ ὅρκου διασαφεῖν καὶ ταύτην ἐξομνύμενον ἀπιέναι. καὶ οὕτω πάντα χρυσόν, ἄργυρον πάντα διεκφορήσας καὶ τὰς χρυσοϋφεῖς ὀθόνας ταῖς ναυσὶν ἐνθέμενος οὐδὲ τῶν σωμάτων αὐτῶν τῶν ὑπ᾽ αὐτοῦ καλαμωθέντων ἀπέσχετο, ἀλλὰ καὶ τούτων ἀριστίνδην τὸ προῦχον συλλαβὼν τῶν τε γυναικῶν ἀποκρίνας ὅσαι τὸ εἶδος καλαὶ καὶ βαθύζωνοι καὶ τοῖς νάμασι πολλάκις τῆς καλλικρούνου Δίρκης λουσάμεναι καὶ τὰς κόμας διευθετισάμεναι καὶ τὴν ἱστουργικὴν κομψότητα καλῶς ἐπιστάμεναι οὕτως ἐκεῖθεν ἀνάγεται.

Translation:

While raiding the towns in between on his way, he attacked the seven-gated Thebes, and having become master of the city, he treated the inhabitants inhumanely. According to the ancient rumour that the city houses wealthy residents, driven by greed for money and knowing no limit to his love for riches, setting as his goal to fill up even the third belt with the quantity of wealth, baptizing all or most ships with it, he pressured the craftsmen and, being meticulous with the filth of obols, subjected the powerful, the noble by birth, the venerable by age, and those distinguished by rank, to various tortures, without any sense of shame or restraint, unmoved by supplications, and not fearing Adrasteia, who had perhaps taken origin somewhere, nor considering the so-called Cadmean victory. Finally, presenting the sacred documents, he forced each person, with their waist girded, to enter and declare under oath their personal property and then, having sworn it, to leave. Thus, having collected all the gold and silver and placed the gold-woven fabrics on the ships, he did not stop even from the bodies of those he had pillaged, but from these too, selecting the best, he chose the women who were beautiful, slender, often bathed in the waters of the beautiful Dirce, and well-versed in the art of weaving, and thus he took them with him. (By Ioanna Tripoula, Panagiota Fragkou, and Skarlatos G. Dedos)

Immanuel Bekker, *Historia*. Eisenstadt: E. Weber, 1835.

Segment 34

Benjamin of Tudela (ca. twelfth century), The Itinerary of Benjamin of Tudela

Thence it is two days' journey to the great city of Thebes, where there are about 2000

Jews. They are the most skilled artificers in silk and purple cloth throughout Greece and from there it is two days' voyage to the city of Salonica, built by King

Seleucus. The Jews are oppressed, and live by silk-weaving.

Marcus Nathan Adler, *The Itinerary of Benjamin of Tudela*. Oxford: H. Frowde, 1907.

Segment 35

Nicetas Choniatis (ca. 1155–1217), Historia

σηρικοῖς τεσσαράκοντα νήμασιν απερ εκ Θηβών έπταπύλων βασιλεῖ κεχορήγηται

Translation:

With forty silk threads which were provided to the king from Thebes of the seven gates. (By Ioanna Tripoula, Panagiota Fragkou, and Skarlatos G. Dedos)

Roberus Unger, *Commentationes de Thebarum Boeticarum primordiis de fluviis fontibusque Thebani agri: et de urbis Thebanae portis*. Sumptibus Lipperti, 1845.

Segment 36

Calendar of Córdoba (ca. 961)

يبدا النساء بتحضين بيض دود الحرير حتى تفقص [يفقص] (February)
ويتولّد دود الحرير (March)
وفيه تخرج الكتب في القرمز والحرير والغاسول للطراز (May)
تخرج الكتب [يخرج الكتاب] في الحرير والصباغ السماوى للطراز (August)

Translation:

And the women start incubating the silkworm eggs until they hatch (for February)
Silkworms hatch (for March)
In this month the tax agents of the provinces receive orders to gather
crimson, silk, and *ghassoul* for the royal workshops (for May)
The tax agents of the provinces receive orders to gather silk and sky-blue dye for the royal workshops (for August)
(By Mr Sotirios A. Mloukie)

Reinhart Pieter Anne Dozy. *Le Calendrier de Cordoue de l'année 961. Texte arabe et ancienne traduction latine*. Edited by R. Dozy. Leiden: Brill, 1873.

Segment 37

Lagardère, Vincent, (1990) Mulberries and Silk Production in Andalus in the Middle Ages (tenth–fourteenth centuries)

p. 431. Cordoue XI^{e}–XII^{e} siècles. Aṣbagh b. Muḥammad (m. 505 H/1111)

Un propriétaire de mûriers les donne à un homme pour qu'il élève des vers à soie en cueillant toutes les feuilles et en fournissant tout le matériel nécessaire : bois, cordes et crochets (al-ḫašab, al-ḥibāl, al-qanānīr) et tout le travail (maʿūna). Une fois l'élevage (tarbiya) terminé, les parties contractantes s'en partageront le produit dans une proportion convenable, par moitié, tiers ou deux tiers. Cette transaction (muʿāmala) est-elle permise ? L'est-elle si le propriétaire des mûriers fournit une partie du matériel (a/a) et de la semence de vers à soie (zarrīʿat al-ḥarīr) et s'engage à fournir une partie du travail recevant ensuite une part fixée du produit de l'élevage (naṣīb maʿlūm)? Ce genre de contrats est fréquent chez nous et cause bien des tracas. Réponse. Ces transactions ne sont pas permises sous la forme indiquée. Le propriétaire des mûriers doit engager un ouvrier (ʿāmil) pour un salaire convenu et ne consistant pas en une part de la soie produite. Les deux parties peuvent fournir chacune une partie de la semence de vers à soie dans la proportion de leur choix, l'ouvrier achetant au propriétaire des mûriers, pour un prix fixé, la quantité de feuilles nécessaire à l'élevage des vers à soie issus de sa part de semence et recevant un salaire déterminé en compensation du travail qu'il fournit et ne consistant pas en une part de la soie produite [Fès, VI, 178; Rabat, VI, 254–255].

Translation:

p. 431. Cordoba eleventh–twelfth centuries. Aṣbagh b. Muḥammad (d. 505 H/1111)

A mulberry-tree owner gives them to a man so that he can raise silkworms by picking all the leaves and providing all the necessary materials: wood, ropes and hooks (al-khashab, al-ḥibāl, al-qanānīr) and all the labour (maʿūna). Once the raising (tarbiya) is completed, the contracting parties will share the product in a suitable proportion, by half, third, or two-thirds. Is this transaction (muʿāmala) permissible? Is it permissible if the mulberry tree owner provides part of the materials (a/a) and the silkworm eggs (zarrīʿat al-ḥarīr) and commits to providing part of the labor in exchange for a fixed share of the product of the raising (naṣīb maʿlūm)? This type of contract is common among us and causes a lot of trouble. Answer. These transactions are not permissible in the indicated form. The mulberry-tree owner must hire a worker (ʿāmil) for an agreed salary that does not consist of a share of the produced silk. Both parties can each provide

part of the silkworm eggs in a proportion of their choice, the worker buying from the mulberry tree owner, for a fixed price, the quantity of leaves necessary for raising the silkworms from his share of eggs and receiving a determined salary in compensation for the work he provides, which does not consist of a share of the produced silk [Fès, VI, 178; Rabat, VI, 254–255]. (By Panagiota Fragkou and Claudio Zanier)

Vincent Lagardère, "Mûrier et culture de la soie en Andalus au Moyen Âge (X^{e}–XIV^{e} siècles)." *Mélanges de la Casa de Velázquez* (1990): 97–111.

Segment 38

King Alfonso X el Sabio (1221–1284), The Silkworms that Wove Veils

Unha muller, sostendo un cesto con vermes da seda, está axeonllada en fronte do altar. Fai xestos á estatua da Virxe que hai consagrada nel. A dona deixa a igrexa coas mans baleiras. Observa os seus vermes e descubre que están tecendo unha touca. Correu fóra e congregou xente. Foron ver os vermes da seda, que compleran a primeira touca e estaban a facer outra. A muller dá a touca a dous frades (dominicanos?) que están de pé diante do altar. Os frades amosan a touca ao Rei Alfonso X, que aparece con tres nobres varóns.

Translation:

A woman, holding a basket of silkworms, kneels in front of an altar. She gestures at the statue of the Virgin enshrined on it. The woman leaves the church empty-handed. She examines her silkworms and finds that they are weaving a veil. She races outside and summons the people. They come to see the silkworms, which have completed the first veil and are making another one. The woman gives a veil to two friars (Dominicans?) who stand in front of an altar. The friars show the veil to King Alfonso X, who appears with three noblemen.

James Chatham, *A Paleographic Edition of the Alfonsine Collection of Prose Miracles of the Virgin*, 1976. (https://csm.mml.ox.ac.uk/index.php?p=poemdata_view&rec=18)

Segment 39

Al-Bakrī, 'Abd Allāh ibn 'Abd al-'Aziz (1040–1094), Description de l'Afrique septentrionale

Les mûriers y sont très-nombreux, et chacun de ces arbres nourrit plus de vers à soie que n'en feraient cinq mûriers dans tout autre pays. Cabes se distingue par la bonté et la finesse de sa soie ; elle est même la seule ville de l'Ifrîkiya qui en produise.

Translation:

Mulberry trees are very numerous there, and each of these trees feeds more silkworms than five mulberry trees would in any other country. Gabès is distinguished by the quality and fineness of its silk; it is even the only city in Ifrīqiya that produces it. (By Panagiota Fragkou and Skarlatos G. Dedos)

'Abd Allāh b. 'Abd 'Aziz Al-Bakrī, *Description de l'Afrique septentrionale*. 1859.

Segment 40

Archives of the Church of Saint Modesto in Benevento

que dicitur "ad Submont" -sita nelle pertinenze di Avellino, e soggetta allo stesso monastero di S. Modesto-, e tutto ci oche quell monastero possedeva in quell luogo, fatta eccezione di um castagneto e dei gelsi ("celsi"), che il monastero si riserva, dandoli loro a mezzadria ("et quando ferit tempus de serico debeamus nos facere colligener [...] et quantum sericum dominus dederit inde debeamus nos divider totum ipsum sericum in due partes, nos tollamus inde medietatem et ad pertem eiusdem monasterii demus exinde reliquam medietatem"): il tutto per la corresponsione di un censo annuo di cinque tari d'oro di moneta salernitana (XX, 34).

Translation:

which is called "ad Submont" – located in the pertinences of Avellino, and subject to the same monastery of San Modesto – and everything that the monastery possessed in that place, except for a chestnut grove and the mulberries ("celsi"), which the monastery reserves, giving them in sharecropping ("and when it is the time for silk we must gather it … and whatever amount of silk the lord gives, we must divide all that silk into two parts, we take half and give the remaining half to the same monastery"): all for the payment of an annual rent of five *tari* of gold in Salerno currency; or more succinctly: When time of silk (*sericum*) will come we (means those who accept the sharecropping) must make to collect (leaves), and the (raw) silk will be produced (*dederit*) we will be obliged to divide in two: we will receive half (*in due partes*) and the other half to the Monastery. (By Claudio Zanier)

Franco Bartoloni, *Le piu antiche carte dell'abbazia di San Modesto in Benevento (secoli VIII–XIII), in Regesta chartarum Italiae*. Vol. 33. Sede dell'Istituto, 1950.

Segment 41

Ugo Falcando (d. ca. 1200), The History of the Tyrants of Sicily

H. Falcand, dans sa lettre au trésorier Pierre, nous a laissé une précieuse description de ces ateliers royaux ; "Il ne convient pas, dit-il, de passer sous silence ces illustres ateliers où la soie est filée en brins de diverses couleurs, que l'on assemble selon plusieurs types de tissage. En effet, on y fabrique des étoffes à un, deux ou trois fils, qui exigent moins de matière et d'habileté, ainsi que des étoffes à six fils, dont le tissu, plus serré, requiert une plus grande quantité de soie. Là, le dinrodun frappe le regard par son éclat ardent ; là, la teinte verdâtre du dinpiatus caresse l'œil d'un aspect agréable ; là encore, les orarcenfimath décorés de cercles variés demandent une quantité plus importante de matière première et une main-d'œuvre plus experte - ils doivent donc se vendre à un prix plus élevé. On y voit également de nombreux autres ornements de couleurs et d'espèces différentes, dans lesquels l'or est tissé avec la soie, et où l'éclat des pierres précieuses vient rehausser la variété des motifs. Parfois même, on enchâsse des perles entières dans des chatons d'or."

Translation:

H. Falcand, in his letter to the treasurer Pierre, gave us a valuable description of these royal workshops. "It is not appropriate," he says, "to overlook these illustrious workshops where silk is spun into strands of various colours that are combined together through several kinds of weaving. Indeed, you will see that fabrics are made there with one, two, and three threads, which require less expense and skill, as well as fabrics with six threads whose denser weave demands more material. There, the yellow of the orpiment catches the eye with a flash of fire, there, the greenish colour of the chrysocolla pleases the eye with a pleasant aspect, there, the garnets set in 'multifilament' decorated with various circles demand a greater amount of raw material and more skilled labour, they must therefore be sold at a higher price. There, you see many other ornaments of different colours and kinds, in which gold is woven with silk, and the brightness of precious stones enhances the variety of designs. Sometimes, whole pearls are set in gold settings." (By Panagiota Fragkou and Claudio Zanier)

Ferdinand Chalandon, *Histoire de la domination normande en Italie et en Sicile*: Librairie A. Picard et fils, 1907; Ugo Falcando, *The History of the Tyrants of Sicily by "Hugo Falcandus," 1154–69*. Manchester University Press, 1998.

Segment 42

Ludovico Lazzarelli (1447–1500), Bombyx (poem)

Gaudet et ipsa suo populosa Hispania fœtu: quæ nervosa magis iam serica stamina mittit.

Translation:

Populous Spain itself also rejoices in its offspring, which now sends forth stronger silk

threads. (By Claudio Zanier)

Lazzarelli, Ludovici. *Ludovici Lazzarelli Septempedani … Bombyx accesserunt ipsius aliorumque poetarum carmina cum commentariis de vitis eorumdem Joanne Francisco Lancillottio a Staphylo auctore*. Apud Petrum Paulum Bonelli, 1765.

Segment 43

Zaccaria Betti (1732–1788), Del baco da seta: canti IV, con annotazione

Da ciò si può sospettare che molto tempo innanzi quanti dati i villici del territorio alla coltura di questi insetti, e forse persino dal 1428, in cui cominciò a decadere dal suo antico splendore parte della lana. Nel 1487 (quando prestar vogliasi fede al Biancolini nelle Giunte al Zagata) era nelle Fiere di Bolzano assai pregiata la nostra seta, benché solo nel 1555 fosse eretta con lodevoli Capitoli l'Arte de' Setaiuoli e de' Filatori, segno evidente che molto allora contava la seta del nostro Paese, onde è che rilevasi dai Registri Camerali, che nel 1556 ne furono denunciate libre 1000.

Translation:

From this, it can be suspected that the peasants of the territory had been cultivating these insects for a long time, perhaps even since 1428, when part of the wool began to decline from its former splendour. In 1487 (if we are to believe Biancolini in the Additions to Zagata) our silk was highly prized at the Bolzano Fairs, although it was only in 1555 that the Guild of Silk Weavers and Spinners was established with commendable statutes, a clear sign that the silk from our country was very significant at that time. It is noted from the Chamber Registers that in 1556, 1000 pounds of it were declared. (By Claudio Zanier)

Zaccaria Betti, *Del baco da seta: canti IV, con annotazione*. Verona: Antonio Andreoni, 1756.

Segment 44

Zaccaria Betti (1732–1788), Del baco da seta canti IV, con annotazione

Come si sia propagata tale specie, non è questione da venirne a capo, atteso che il solo Pattarol le ha conosciute ambedue. Il Vida, l'Aldovrando, l'Autore dello Spettacolo della Natura, ed il Padre Granata videro solo questi. Il Libavio, il Polfranceschi, il Corfucci, il Malpighi, il Savages, e il Reaumur conobbero gli altri. Accoppiai quelle due differenti specie, unendo diversa femmina con diverso maschio, e ne nacquero certi piccoli Bacolini, che avevano irregolari e senza ordine le loro mute, e che quando lo credetti dovessero vivere ancora lungo tempo, si interrarono in un sottilissimo bozzolo, non più grande del frutto di un bosso.

Translation:

How this race has propagated is not a question to be resolved, given that only Pattarol has known both. Vida, Aldovrando, the Author of the Spectacle of Nature, and Father Granata saw only these. Libavio, Polfranceschi, Corfucci, Malpighi, Savages, and Reaumur knew the others. I crossed those two different races, joining different females with different males, and certain small Bacolini were born, which had irregular and disordered moults, and when I thought they should still live for a long time, they buried themselves in a very thin cocoon, no bigger than the fruit of a boxwood. (By Claudio Zanier)

Zaccaria Betti, *Del baco da seta: canti IV, con annotazione*. Verona: Antonio Andreoni, 1756.

Segment 45

Ludovici Lazzarelli (1447–1500), Bombyx (poem)

Dat ternæ apparens in dorso littera nomen. Vidi ego qui senis ferrent hæc grammata nodis Usque imam pictos a summo vertice caudam Alpha Alpha duplex: co grande duplex, geminumq. ferebant X græcum: Summi augustissima nomina Christi Et simplex c.ɔ grande prius: dehinc Alpha gemellum: c.ɔmega tunc iterum distinguens terga videtur; X geminum extremam præcedit denique caudam, Dat quartæ esuries nomen. tunc pene voraces Vix unquam explentur: folia ipsa injecta

frequentes "Accumulata vorant: vix norunt parcere ramis. Septima lux illos explet: faturosque videbis Ore gerunt stamen semper: Mutatio quarta Filum adimit: nec restituit ni tota recedat Esuries tunc colla levant tunc fila remittunt Electro similes: purgato & corpore lucent. Rictibus explorant tensis extrema per ipsa, Tecta ubi contexant suprema commoda forti. Tunc vites opus est seu quernos ordine ramos Vel potius siccas disponere rite myricas: Et bene dispositis purgatos ponere ramis Viscera nent, & nendo vomunt: texuntque vomendo Se circum instantes Ovi sub imagine tectum. Sunt qui albam, sunt qui croceam, sunt quiq. rubentem Subviridem quidam contexunt stamine telam Subviridis color ante alios laudatur in illis. "Ante tamen croceo sunt æmula viscera gummi Succina populeis velut est gemma aurea ramis, Jamque locis variis diversa exordia sumunt, Denique idem faciunt: operi datur una figura! Sæpe duo unanimes tela clauduntur in una; Femina mas que simul communia tecta volentes Viscera sibi sponte domos sibi sponte sepulcra Ædificant, factisque ultro moriuntur in Antris Unde iterum surgunt: surgentibus altera forma est Papilionis habent speciem, sed corpore crasso: Cornibus & binis hirsuto: imitantibus arcum. Bina supercilia: atque oculi sunt fronte gemelli. Alati exiliunt per facta foramina bustis. Quæ modo condiderant, non ultra pabula curant: Non ultra esuriunt: curæ est iis "sola voluptas Gignendæ Sobolis: veluti mos ipse Catellis Sic coeunt: vinctique diu solvuntur: & ova Millia parturiunt venturae feminae prolis, Quæ tandem ut pariant alium servantur in Annum. Ante sed adscensum quæ sint si tempora poscas, Esse quater denas servavi ab origine luces. Ni partum cibus impediat, vel frigidus aer.

Translation:

The third displays a letter on the back which gives it its name. I have seen those that carried these letters with six knots from the top of the head to the bottom of the tail. Double Alpha: great double O, and almost twin Greek X: the most august names of Christ and single C, O great first: then twin Alpha: O Omega then again distinguishing the back; Twin X finally precedes the end of the tail, The fourth hunger gives its name. Then almost voracious They can hardly ever be satisfied: the leaves themselves thrown in frequently Accumulated they devour: they hardly spare the branches. The seventh day completes them: you will see them with full mouths They always carry the thread: the fourth transformation Takes away the thread: and does not restore it unless the entire hunger goes away Then they lift their necks, then they let go of the thread Like amber: they shine with a purged body. With stretched jaws they explore the very tips, Where they may weave the supreme useful cover. Then it is necessary to place either oak branches Or rather dry tamarisks in order: And to place the branches cleaned and arranged properly They spin their innards, and while spinning they vomit: they weave while vomiting They surround themselves with a cover in the shape of an egg. Some weave white, some weave yellow, some red, some greenish, and they weave a web with greenish thread The greenish colour is praised above all others. However, their viscera first compete with the yellow gum Like amber is like a golden gem on poplar branches, and now they take on different beginnings in various places, Finally, they all do the same: the work takes one form! Often two like-minded ones are enclosed in one web; Female and male together willingly sharing common cover They build houses for themselves and willingly tombs for themselves and willingly die in the constructed caves from which they rise again: their rising form is different They have the appearance of a butterfly, but with a thick body: With two horns hairy: imitating an arc. Two eyebrows: and eyes are twins on the forehead. Winged they leap through the holes made in the tombs. What they had just built, they no longer care for food: They no longer hunger: their care is for their sole pleasure of generating offspring: just as is the custom for dogs So they mate: bound for a long time they are released: and lay Thousands of eggs for future offspring, which finally are kept to give birth to another generation. But before the ascent, if you ask for the times, I have kept forty days from the beginning. Unless food impedes birth, or cold air. (By Claudio Zanier)

Ludovici Lazzarelli, *Ludovici Lazzarelli Septempedani [...] Bombyx accesserunt ipsius aliorumque poetarum carmina cum commentariis de vitis eorumdem Joanne Francisco Lancillottio a Staphylo auctore*. Apud Petrum Paulum Bonelli, 1765.

Segment 46

Joseph Guichard (eighteenth century), L'art de faire éclorre et d'élever les vers a soie: tel qu'on le pratique dans le Levant.

De ces quatre nourritures.
5 mûriers 1 once 0 gros 0 deniers 7 grains 17 livre.
17 mûriers 3 once 0 gros 0 deniers 21 grains 40 livre.
40 mûriers 6 once 0 gros 1 deniers 18 grains 75 livre.
61 mûriers 12 once 5 gros 0 deniers 18 grains 100 livre

Translation:

Of these four rearing efforts.
5 mulberry trees 1 ounce 0 gros 0 deniers 7 grains 17 pounds
17 mulberry trees 3 ounces 0 gros 0 deniers 21 grains 40 pounds
40 mulberry trees 6 ounces 0 gros 1 denier 18 grains 65 pounds
61 mulberry trees 12 ounces 5 gros 0 deniers 18 grains 100 pounds
(By Panagiota Fragkou and Claudio Zanier)

Joseph Guichard, *L'art de faire éclorre et d'élever les vers a soie: tel qu'on le pratique dans le Levant*. Avignon: J. Guichard, 1786.

Segment 47

Zaccaria Betti (1732–1788), Del baco da seta: canti IV, con annotazione

le quali, l'antico computo di mille bozzoli per formare una libbra di seta.

Translation:

according to the old calculation of a thousand cocoons to produce one pound of silk.
(By Claudio Zanier)

Zaccaria Betti, *Del baco da seta: canti IV, con annotazione*. Verona: Antonio Andreoni, 1756.

Segment 48

Manuel A. Sánchez Martínez, "La cora de Ilbira (Granada y Almería) en los siglos X y XI, según al-Udri (1003–1085)", 1976.

Los ingresos del estado percibidos en la cora de Elvira durante los emiratos de al- Ḥakam y de su hijo ʿAbd al-Raḥmān fllueron los siguientes: 109.603 dinares en peso (bi-l-wāzina); 1.000 *ritl* de seda …

Translation:

The state revenues collected in the court of Elvira during the emirates of al-Ḥakam and his son ʿAbd al-Raḥmān were as follows: 109,603 dinars by weight; 1,000 *ritl* of silk … (By Panagiota Fragkou and Skarlatos G. Dedos)

Manuel A. Sánchez Martínez, "La cora de Ilbira (Granada y Almería) en los siglos X y XI, según al-Udri (1003–1085)," 1976.