

THE NOTITIA DIGNITATUM, TEXTILE MANUFACTURING, WOOL PRODUCTION AND SHEEP GRAZING DURING THE ROMAN EMPIRE IN PANNONIA SECUNDA, NEAR SIRMIIUM

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As part of the Joint Australian – Serbian archaeological project at Glac near ancient Sirmium, an archaeological survey is being undertaken of a Study Area of a 700 km² slice of the catchment of the Sava River. Two of the objectives of the survey are to understand the environmental conditions and the nature of the rural economy in the Study Area during the Roman period. As part of this survey an examination has been undertaken of existing literary, epigraphical and archaeological evidence relating to the area in the Roman period. Consideration has been given to the Notitia Dignitatum (“The List of Offices”) that lists two imperial weaving houses (gynaecea) at Sirmium (modern Sremska Mitrovica) and Bassianae (adjoining the modern village

of Donji Petrovci). The location of two imperial weaving houses in such close proximity to each other is unprecedented, subject to a peculiarity at Salona and Split, and has not previously been noted. The potential implications of the existence of two imperial weaving houses in such close proximity are considered together with potential implications on the likely rural economy and the environmental conditions of the area in the late Roman period.

Key words:

Sirmium, Bassianae, Glac, Imperial Weaving Houses (gynaecea), Notitia Dignitatum, Sheep Grazing, Roman Pannonia, Wool Production

Introduction¹

A joint Australian – Serbian archaeological survey project commenced in 2017 in the north-west of Serbia. This archaeological survey is part of the Glac Project, a co-operative program between The University of Sydney and the Institute of Archaeology, Belgrade, under the co-directorship of Professor Richard Miles and Dr Stefan Pop-Lazić.²

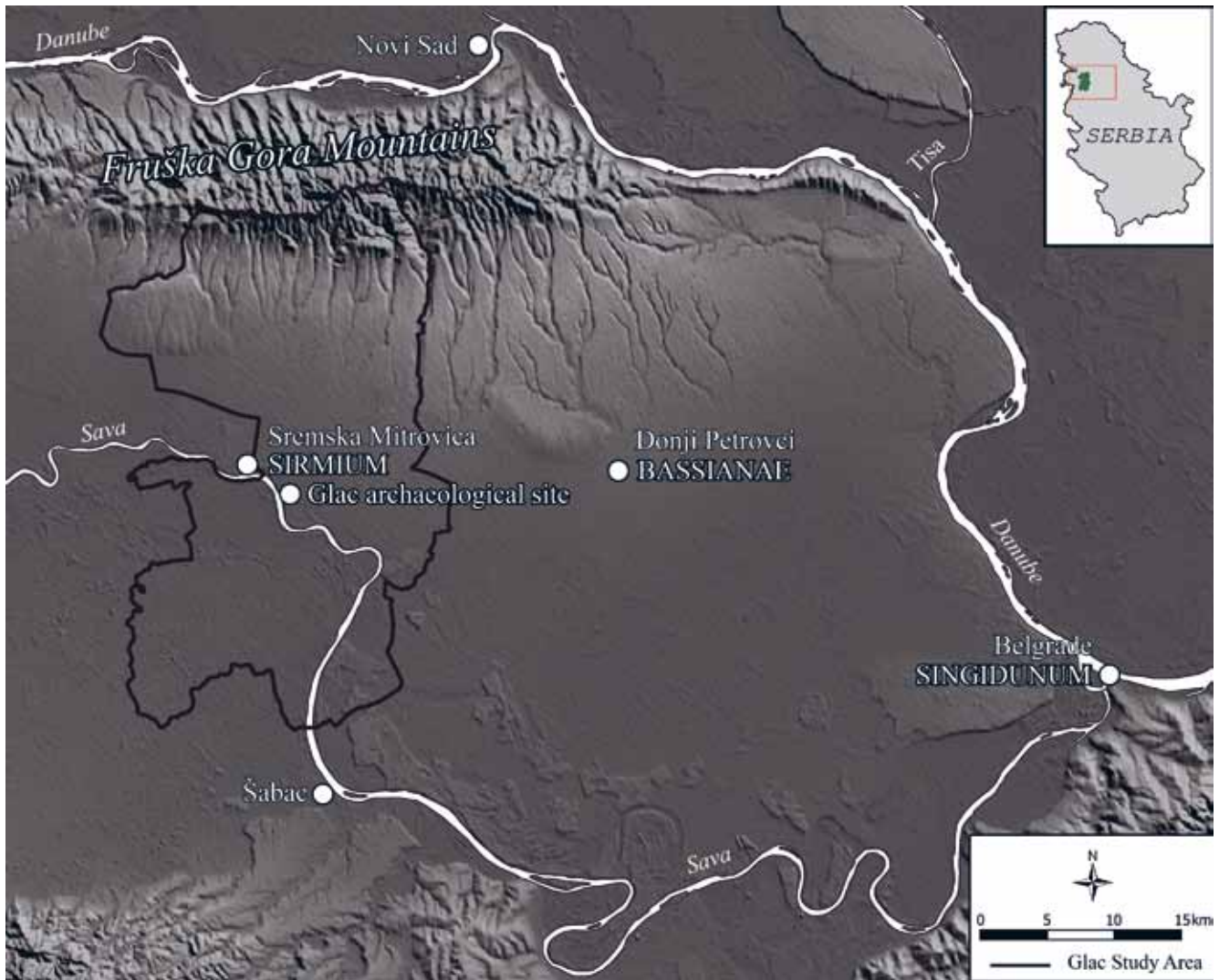
Associated with the archaeological excavations of the Glac site, the Glac Survey is being undertaken as a comprehensive archaeological survey of the area around Glac to position the site

and the region within a broader chronological framework, and with reference to the historical and political contexts afforded by documentary evidence. The survey component of the overall Glac Project is undertaken under the leadership of the authors of this paper.

The area the subject of the Glac Survey, known as the Glac Study Area encompasses the territory around the Glac site, including a part of the Srem region northeast of the Sava river and a part of the Mačva region southwest of the river. It covers approximately 700 km², between the Fruška Gora mountains on the north, and the Jerez river on the south, between the Čalma meridian on the west (excluding the town of Sremska Mitrovica), and the Jarak-Ruma meridian on the east. In antiquity, the Study Area was within the late Roman province of Pannonia Secunda, around the Roman city of Sirmium, and touching the territory of Bassianae north-east of Sirmium.

¹ The Authors wish to thank Richard Miles, Brent Shaw, Mihajlo Džamtočki, Aleksandar Stamenković, Bruno Bijadija, and two anonymous reviewers for their assistance and comments in the preparation of this paper.

² Further details of the Glac Project and the Glac site can be found at <https://glac-project.sydney.edu.au>



MAP 1. Glac Study Area (made by A. Stamenković).

The Glac Survey Project has four components:

- A regional settlement pattern survey to identify the spatial and temporal settlement patterns during the Roman period.
- To establish the environmental context of the settlement pattern during the Roman period.
- In the light of the preceding, to establish the consequential rural economic base of the region during the Roman period.
- A survey of the immediate environs of the Glac villa to identify outbuildings, cemeteries, water supply, transport routes, and the relationship with the Sava River.

The survey methodology involves rigorous quantitative analysis of surface finds, sampling the various biophysical units in the survey area, and an extensive paleoenvironmental study based on pollen and sediment analysis. Both the surface survey and the paleoenvironmental studies are likely to cast further light on the issues raised in this paper.

As part of Glac Survey, an examination has been undertaken of literary and epigraphical evidence relating to environmental conditions and the rural economy of the Study Area in the Roman period. In the course of this review an interesting and highly unusual aspect of the *Notitia Dignitatum* (“The List of Offices”), which has not been the subject of previous consideration, was identified³. This aspect of the *Notitia Dignitatum* is the subject matter of this paper. The *Notitia Dignitatum* lists two imperial weaving houses (*gynaecea*) at Sirmium and Bassianae. This raises hypotheses about the nature of agricultural activities in the Study Area, and about the balance between cropping and pastoral undertakings in the Late Antiquity.

3 There is an enormous literature on the *Notitia Dignitatum* helpfully compiled by Maier at <https://www.notitiadignitatum.org/> (accessed on 4 May 2022) with copies, editions, translations and bibliographies from 1801 until the current day.

The Evidence of the *Notitia Dignitatum*

The *Notitia Dignitatum* is a document listing civil and military posts in the late Roman Empire. It outlines the administrative organization of the Eastern and Western Empires and describes several thousand offices from the imperial court to provincial administration and army units. The texts come to us through manuscripts dated to the 15th – 16th centuries CE.⁴ These manuscripts are not likely to be direct copies of a late antique manuscript, but copies of an earlier Carolingian one from the 9th century CE⁵, providing potential sources of error in the text due to recopying.

The *Notitia* was an official document prepared by the chiefs of the notaries in the East and West respectively. The dating of the *Notitia* is unclear, but it appears to have been prepared no earlier than 421 CE combining eastern and western registers of different dates, each of which contain material that was obsolete.⁶

The Latin text is as follows:

“Procuratores gynaeciorum:

Procurator gynaecii Bassianensis, Pannoniae secundae - translati Salonis.

Procurator gynaecii Sirmensis, Pannoniae secundae.

Procurator gynaecii Iovensis Dalmatiae - Aspalato.

Procurator gynaecii Aquileiensis, Venetiae inferioris.

Procurator gynaecii Mediolanensis, Liguriae.

Procurator gynaecii urbis Romae.

Procurator gynaecii Canusini et Venusini, Apuliae.

Procurator gynaecii Carthagensis, Africae.

Procurator gynaecii Arelatiensis, provinciae Viennensis.

Procurator gynaecii Lugdunensis.

Procurator gynaecii Remensis, Belgicae secundae.

Procurator gynaecii Tornacensis, Belgicae secundae.

Procurator gynaecii Triborum, Belgicae primae.

Procurator gynaecii Augustoduno translati Mettis.

Procurator gynaecii (in Britannis) Ventensis.”⁷

The English translation is as follows:

“XI. THE COUNT OF THE SACRED BOUNTIES.

Under the control of the illustrious Count of the Sacred Bounties.

.....

Procurators of the weaving-houses:

The procurator of the weaving-house at Bassianae, in Pannonia secunda-removed from Salona,

The procurator of the weaving-house at Sirmium, in Pannonia secunda,

The procurator of the Jovian weaving-house at Spalato in Dalmatia,

The procurator of the weaving-house at Aquileia in Venetia inferior,

The procurator of the weaving-house at Milan in Liguria,
The procurator of the weaving-house in the city of Rome,
The procurator of the weaving-house at Canosa and Venosa in Apulia,
The procurator of the weaving-house at Carthage in Africa,
The procurator of the weaving-house at Arles in the province of Vienne,
The procurator of the weaving-house at Lyons,
The procurator of the weaving-house at Rheims in Belgica secunda,
The procurator of the weaving-house at Tournay Belgica Secunda,
The procurator of the weaving-house at Trier in Belgica secunda,
The procurator of the weaving-house at Autun- removed from Metz,
The procurator of the weaving-house at Winchester Britain.”⁸

For the Eastern Empire, the *Notitia Dignitatum* lists under the Count of the Sacred Bounties the procurators of the weaving-houses, but unlike for the Western Empire there is no list of how many procurators there are and where they are located.⁹

Of interest is the location of two of the imperial weaving houses in close proximity to the Glac Study Area, one at Sirmium (modern Sremska Mitrovica) and the other at Bassianae (adjoining the modern village of Donji Petrovci).

In particular, there are two interesting features.

Firstly, that there are two imperial weaving houses so closely located to each other, being separated by 27 km. This is a remarkably small distance and hence a high density for imperial weaving houses. By comparison, the distance between the other close locations for imperial weaving houses are as follows:

•Arles to Lyon: 284 km

•Aquileia to Milan: 391 km

•Trier to Autun: 452 km.

The location of two imperial weaving houses in such close proximity to each other is unprecedented. In this context there is also an anomalous issue in relation to the imperial weaving house(s) at Split and Salona, which is discussed later.

Secondly, while Sirmium was a major Roman city, Bassianae was a small modest town of no major administrative significance and the procurator of the weaving house was the only high official located there. To appreciate the relative scales of the cities and towns where imperial weaving houses were located, the following table derived from Hanson’s work (except for the area of Spalatum / Split) indicates the physical area of the city or town as a reasonable proxy for city and town size given the vagaries of population estimates for Roman cities:¹⁰

4 Fairley (ed.) 1899, 2; Alexander 1976, 11; Faleiro (ed.) 2005, 29–134.

5 Alexander 1976, 19.

6 Brennan 2018, 411–412.

7 Faleiro (ed.) 2005, 366–367; *Not. Dign. [Occ.]* 11.45–60; Seeck (ed.) 1876, 150–151.

8 *Not. Dign. [Occ.]* 11. 45–59; Seeck (ed.) 1899, 150–151; Fairley (ed.) 1899, 31.

9 *Not. Dign. [Or.]* 13. 4. *Not. Dign. [Or.]* 13.16; Seeck (ed.) 1876, 35–36; Fairley (ed.) 1899, 12–13.

10 Hanson 2016.

- Arles 62 ha
- Aquileia 80 ha
- Autun 172 ha
- Bassianae 18 ha
- Canosa 20 ha / Venosa 44 ha (total of 64 ha)
- Carthage 343 ha
- Lyons 170 ha
- Milan 105 ha
- Rheims 57 ha
- Rome 1783 ha
- Salona 58 ha
- Sirmium 78 ha
- Split / Spalatum 3.8 ha¹¹
- Tourney unknown
- Trier 131 ha
- Winchester 58 ha.

Bassianae covering an area of 18 ha is dramatically smaller in size than all of the other cities or towns where an imperial weaving house was located, other than the Palace of Split and Canosa / Venosa in Puglia which are discussed later.

An explanation of these two unusual features merits consideration. Any explanation may have implications for the nature of land use and the rural economy in the Glac Study Area.

In general terms, the rationale for the location of imperial weaving house may relate to the following:

- a) The availability of raw material supplies of wool from sheep farming for these imperial weaving houses;
- b) The location of the users and recipients of the manufactured products of the imperial weaving houses, namely the military field forces.

Additionally, another criterion for the location of an imperial weaving house could have been the towns which were also main administration centres.¹²

Textual Issues

Before exploring an explanation of these features, there is an issue whether the *Notitia Dignitatum* can be used as a reliable historical source, and an issue of interpretation of the text. Brennan has proposed that the *Notitia Dignitatum* did not serve an administrative purpose of enumerating various offices but rather an ideological purpose to create an illusion of imperial unity and cohesion which did not exist in reality.¹³ If that is the case, any attempt to use it to reconstruct the late imperial administration is misconceived. Kulikowski has reinforced this concern, particularly in relation to the western empire suggesting that unless there is external corroboration, the document is not useable for the western empire.¹⁴ This issue of phantom positions and

military units is less likely where the position relates to a physical entity such as a weaving establishment located in a specific town, as the existence of that physical entity is capable of being known and verified. Where a physical entity such as a weaving establishment located in a specific town is mentioned, it is likely to have existed at one time or another to maintain a semblance of credibility for the document as a whole as an instrument of propaganda. Propaganda only works if fact is mixed with fiction, with the fiction relating to things which cannot be disproved, while the fact relates to something known to be true. Recently Brennan has noted the *Notitia Dignitatum* has characteristics of an antiquarian compilation and the inclusions of illustrations suggests it was a presentation copy.¹⁵

So far as the interpretation of the text is concerned, in Chapter XI of the Latin text of the *Notitia Dignitatum* it says:

“Procurator gynaeicii Bassianensis, Pannoniae secundae – translati Salonis.”

The Fairley translation of this reads:

“The procurator of the weaving-house at Bassianae, in Pannonia secunda – removed from Salona.”¹⁶

Given there is no participle before ‘*Salonis*’, at first glance this noun could potentially be in the ablative or dative case. If it is assumed that that noun ‘*Salonis*’ is in the ablative case as it is a place (even though there is no preposition), then the participle/noun combination would be translated as ‘handed over from Salona’ or ‘(having been) transferred from Salona’.

There are strong grounds to regard the reference to “*translati Salonis*” as being a medieval corruption of the manuscript of the *Notitia Dignitatum*. The area of Bassianae was significantly impacted by the deteriorating security conditions on the Danube frontier in the 4th century CE, with raids by the Sarmatians in 374 – 375 CE and Gothic incursions after the Battle of Adrianople in 378 CE and the capture of Sirmium by Attila and the Huns in 441 CE.¹⁷ It would have been illogical to transfer the imperial weaving house from the secure location of Salona on the Adriatic to the precarious location of Bassianae at the end of the 4th century CE when the *Notitia Dignitatum* was composed. Rather the more obvious choice would have been to relocate the imperial weaving house from Bassianae to the more secure location of Salona around the time of the beginnings of the Sarmatian raids in the 370s. Alternatively, the transfer of the imperial weaving house from Bassianae to Salona may have been a consequence of the division of the empire at the death of Theodosius I in 395 CE. The view that the imperial weaving house was relocated from Bassianae to Salona and not the reverse is accepted by all authors who have considered this question.¹⁸ Thus, the presence of the imperial weaving house originally at Bassianae, but later relocated to Salona at the end of the 4th century CE will be accepted.

11 Wilkes 1986, 25.

12 Wild 1976a, 53.

13 Brennan 1996.

14 Kulikowski 2000, 376.

15 Brennan 2018, 412–413.

16 Fairley (ed.) 1899, 31.

17 Milin 2004, 257.

18 Wilkes 1986, 83, 121, fn. 188; Belamarić 2004, 147; Milin 2004, 257; Tóth 2009, 137.

There is no evidence for the dates for the establishment of the weaving houses in Sirmium and Bassianae. It is likely that the one at Sirmium was established with the inception of the program of imperial weaving houses, given its status as an imperial residence for long periods in the 2nd and 3rd centuries CE. In the light of this it is unlikely that there was only one weaving house in the region at Sirmium, which was then relocated from a city with an imperial residence and fortified walls to a small town like Bassianae and ultimately to Salona. The possibility of the one at Bassianae being relocated to Sirmium is excluded by the specific mention in the *Notitia Dignitatum* of its relocation to Salona. It is a reasonable working assumption that there were two imperial weaving houses operating contemporaneously in Sirmium and Bassianae at least until the one in Bassianae was relocated to Salona, subject to the qualification of the enigmatic nature of the *Notitia Dignitatum*. The approach taken to the interpretation of a source such as the *Notitia Dignitatum* is to presume its accuracy, unless its context, purpose, or the presence of demonstrable errors indicates otherwise, rather than treating such a source as “fake news”.

Significance of Two Imperial Weaving Houses in Close Proximity

The question of whether the contemporaneous location of imperial weaving houses in two towns so close together would have any implications on the rural economy of the region depends on the scale of imperial weaving houses. If they were small scale enterprises with only small outputs of textiles (and hence a small demand for wool), then it is unlikely their presence in a town or city would have any noticeable effect on the rural economy of an area as most Roman towns possessed privately operated weaving enterprises. If the production of textiles was considerable and hence there was a considerable demand for wool, the wool would have to be sourced either locally or imported. If it was sourced locally, it is likely there was a considerable effect on the rural economy of the area around the towns.

To appreciate the potential implications of the location of two imperial weaving houses in such close proximity to each other, the following issues will be explored in turn from the existing literature.

First, the level of demand for textiles in southern Pannonia. Second, the nature of the imperial weaving houses, to ascertain what was involved in one. Third, the scale of imperial weaving houses to understand whether they were small scale enterprises or larger industrial facilities with significant outputs of textiles and hence considerable demand for raw wool. Fourth, the production stages for woollen cloth, to understand the steps involved and their likely spatial distribution. Fifth, the nature of the Roman wool trade to ascertain the extent to which wool for the production of utilitarian textiles would be derived from long distant trade, regional trade or locally sourced. Sixth, if wool is locally sourced what that extent of sheep grazing would suggest for the nature of local agricultural enterprises. Seventh, to what extent is there archaeological evidence of extensive sheep grazing in Roman Pannonia. Eighth, how would sheep grazing in the region of Sirmium and Bassianae relate to what is known of the

local environment.

The exploration of these issues will be briefly undertaken by a review of relevant existing literature to suggest likely answers to these questions.

There is a peculiarity in relation to the weaving house(s) at Split and Salona. The *Notitia Dignitatum* identifies a *Procurator gynaeicii Iovensis Dalmatiae – Aspalato* (the procurator of the Jovian weaving-house at Spalato in Dalmatia). Spalatum is the Latin name for the Palace of Diocletian at Split. The *Notitia Dignitatum* also identified that the procurator of the weaving house located at Bassianae was relocated to Salona. Also, it lists a “*Procurator baffi Salonitani, Dalmatiae*” (procurator of the dyeing works at Salona in Dalmatia). The city of Salona, the capital of the Roman province of Dalmatia, was established as a colony by Caesar in about 47 BCE. The Palace of Diocletian was located at Spalatum (formerly Aspalathos in Greek) and constructed in the beginning of the 4th century CE. Spalatum is located on the coast of the Adriatic, 4.8 km from the centre of Salona, just outside of the city in its peri-urban zone. It raises the issue of whether this is a question of two weaving houses located close to each other, or whether it is one expanded facility involving activities in the city and the nearby palace. The latter may be a more accurate characterisation of a change which was the result of imperial retreat of facilities faced with external threats. This is the view of Belamarić who writes: “The Split *gynaeceum* should have probably been in some kind of complementary relationship with the *gynaeceum* moved to Salona, perhaps for security reasons, from Bassiana....”¹⁹ But it also points to Dalmatia and the Salona / Spalatum area as being a fall-back location for imperial weaving houses where there was a potential to supply significant quantities of wool when the previous location in Pannonia Secunda at Bassianae suffered from enhanced risks.

Endre Tóth has argued that in the reference in the *Notitia Dignitatum* to *Procurator gynaeicii Iovensis Dalmatiae – Aspalato*, Iovensis is not a reference to Jupiter with whom Diocletian identified but the Pannonian town of Civitas Iovia (Botivo).²⁰ A large number of locations in Pannonia bore the name Iovia to commemorate Diocletian's divine attribution.²¹ The town is listed on a number of the late imperial itineraries. Its location has not been conclusively identified, but it is generally considered to be either in Ludbreg in Croatia or Alsóhetény Kapospula in Hungary, with Ludbreg generally preferred. Tóth translates the “*procurator gynaeicii Iovensis Dalmatiae-Aspalato*” in the *Notitia Dignitatum* as the “procurator of the weaving-house in Iovia transferred to Spalatum of Dalmatia” and he interprets this as meaning that the weaving house formerly situated in Iovia was then transferred to Spalatum in Dalmatia.²² Tóth's argument is at best tenuous based on the text, when the textual formula used is compared to that relating to the transfer of the weaving house

19 Belamarić 2004, 147.

20 Tóth 2009, 136.

21 Gregl, Migotti 2004, 131; Tóth 1982.

22 Tóth 2009, 136–137.

from Bassianae. Moreover, it faces the difficulty that if the system of State-run weaving houses was instituted by Diocletian, it is unlikely that he would not have located one in his own palace at Spalatum / Split, particularly when the palace appears to be purpose built to accommodate an imperial weaving house and the aqueduct sized to service an imperial weaving house.²³

If Iovia is modern Ljubljana, the distance between Ljubljana and Sremska Mitrovica (ancient Sirmium) is 265 km which is almost the same as the distance between the imperial weaving houses at Arles and Lyon, the other closest locations and orders of magnitude greater than the 27 km between Sirmium and Bassianae. Even if Iovia is Alsóhetény Kapospula, the distance from there to Sirmium is 195 km, again a vast increase from the distance between Sirmium and Bassianae. If Iovia is modern Ljubljana, the area of the town in the Roman period has not been accurately ascertained, but it was small, probably no larger than Bassianae.²⁴

The *Notitia Dignitatum* also includes in the list of offices under the control of the Count of the Sacred Bounties, the following:

«*Procurator gynaeceii Canusini et Venusini, Apuliae*».²⁵

The Fairley translation translates this in English as:

“*The Procurator of the weaving house at Canosa and Venosa in Apulia*”.²⁶

The weaving houses at Canusium in Apulia (modern Canosa in Puglia) and Venusia in Apulia (modern Venosa in Puglia) are both listed in the *Notitia Dignitatum* as being under a single procurator and described as a singular weaving house not the plural weaving houses. As a result, it would have had a single administrative structure under the same procurator, even though parts of the activities were carried out in different locations. The distance between Canosa and Venosa is 22 km. But this is not an example of two weaving houses close to each other with separate administrative structures, as is the case with the weaving houses at Sirmium and Bassianae (or later with Split and Salona), but rather of a single weaving house with activities undertaken in two different locations. It is noted that this is the only example in the *Notitia Dignitatum* of a weaving house being identified in two locations. The reason for this may have been that the scale of activities in Canusium and Venusia were of not a sufficient size to justify separate procurators. Conversely, the scale of activities in Sirmium and Bassianae (and later in Split and Salona) were of such a size as to justify or require two separate procurators with separate administrative structures, despite their proximity to each other.

The Level of Demand for Textiles in Pannonia Secunda

The Roman state bore the responsibility for providing clothing to its soldiers.²⁷ The quantities of textiles required for garments is speculative to estimate. But if the imperial weaving houses

just supplied legionary troops, then in the reign of Diocletian there were 2 legions in Pannonia Inferior and Moesia Superior to be clothed.²⁸ The positioning of legions along the Danube does not disclose a greater concentration of troops in Pannonia Inferior than elsewhere along the Danube, thereby discounting any explanation that the concentration of imperial weaving houses near the Glac Study Area was based upon a concentration of users and recipients of the manufactured products of the imperial weaving houses.²⁹

However, despite this, Liu states: “Suppose each soldier needed two sets of clothing and two sets of undergarments under their armour each year, and additionally allow for some other textile products, about 440,000–520,000 pieces of textile articles would be needed by the military in the Rhine provinces, Britain and Rome annually in the first century. In the second century, the military in the Danube provinces alone would need at least 400,000 pieces of clothing per annum. These are just the bare minimums, based on relatively low estimations of the military strength in these regions and individual demand for textile products”.³⁰ These estimates provide some indication of scale of demand. Liu notes that State run establishments such as *gynaecea* may also have been closely connected with military clothing supply, but despite this increased State control, civilian craftsmen remained important suppliers of clothing in the 4th century.³¹ Hence the *gynaecea* appear not to be the exclusive suppliers of textiles to the military, or as is perhaps more likely, they provided the textiles to private garment manufacturers who made the finished garments for the military.

The Nature of the Imperial Weaving Houses

The imperial weaving houses (*gynaecea*) were established in the late 3rd century CE according to most authors and are usually ascribed to the First Tetrarchy of Diocletian and Maximian.³² They were part of a system of state arsenals (*fabricae*) indicating a move to central planning and control for the provision of key supplies for the military.³³ However, precise attribution to Diocletian has not been established. The *gynaecea* were certainly in existence by the time of Galerius (who was Augustus from 305 – 311 CE following the reign of Diocletian), in whose time Lactantius writes:

“*Matres familias ingenuae ac nobiles in gynaeceum rapiuntur*”;³⁴ that is: “Mothers of families, free born and even noble girls were seized for the gynaeceum”;³⁵ or, “Idle matrons of honourable station were dragged into weaving houses”.³⁶

23 Belamarić 2004, 142ff.

24 Gregl, Migotti 2004, 135.

25 *Not. Dign. [Occ.]* 11. 52; Seeck (ed.) 1899, 151.

26 Fairley (ed.) 1899, 31.

27 Droß-Krüpe 2012, 13–14.

28 Farnum 2005, 80.

29 Farnum 2005.

30 Liu 2012, 21; see also the discussion in Wild 2002, 31–32 on production output in Roman Britain.

31 Liu 2012, 20.

32 Jones, 1960, 356; 1964, 834–837; Wild 1976a, 54; Belamarić 2004, 146.

33 Lee 2007, 89–94.

34 Lactantius, *De mort. pers.* 21.4; Brandt (ed.) 1893, 196–197; *De mortibus persecutorum* was written probably in 314 CE according to Barnes 1973, 39.

35 McDonald 1965, 164.

36 Translation by the author, J. Whitehouse.

Their establishment is presumed to have been part of Diocletian's economic reforms as conventional clothing levies and taxation in kind were not proving adequate to meet the clothing needs of the military.³⁷ The imperial weaving houses were directed at the supply of clothing for the military and not for general textile production. Their importance can be measured by their inclusion in the responsibilities of a high official in Rome, the Count of the Sacred Bounties, rather than under a provincial official. Additionally, the Count of the Sacred Bounties' responsibilities in the *Notitia Dignitatum* related to matters of fundamental importance to the empire, including taxation, storehouses, gold and mints, plus weaving houses, purple-dye houses and linen weaving.

It is interesting to speculate as to whether Maximian had any role in the selection of the localities for the imperial weaving houses, and whether he was indulging in some home area favouritism in placing two in close proximity to his birthplace.

The Latin word *gynaecium* or imperial weaving house is a Greek loan word and refers to the women's quarter of a house and it embraced the activities carried out there such as spinning and weaving, from the Ancient Greek γυναικεία (*gynaikēia*) "part of the house reserved for the women"; literally "of or belonging to women, feminine". In late Antiquity it is the term used in the *Notitia Dignitatum* to refer to the state-run imperial weaving houses. This indicates that a significant proportion of the workforce in the weaving houses were women. Additionally, many of the workers in the imperial weaving houses were prisoners or slaves, as suggested in the reference by Lactantius noted above. Eusebius notes that after his victory over Licinius, Constantine freed Christians enslaved in the imperial weaving houses:

"Lastly, if any have wrongfully been deprived of the privileges of noble lineage, and subjected to a judicial sentence which has consigned them to the weaving houses and to the linen making, there to undergo a cruel and miserable labour, or reduced them to servitude for the benefit of the public treasury, without any exemption on the ground of superior birth; let such persons, resuming the honours they had previously enjoyed, and their proper dignities, henceforward exult in the blessings of liberty, and lead a glad life"; or, "Those moreover who were forcibly deprived of their noble rank and subjected to a judicial sentence of such a kind that they were sent to women's quarters or linen factories and endured unwanted and shameful toil, or were reckoned Treasury slaves, their former gentle birth notwithstanding, these are to rejoice in the honours they previously enjoyed and in the benefits of liberty; they are to claim their ancestral rank and to live henceforth in complete happiness".³⁸

This also indicated that working conditions in the imperial weaving houses were very poor. The use of slaves in the imperial weaving houses is confirmed in the Theodosian Code which records the fine for harbouring slaves from the imperial weaving houses issued in 380 AD.³⁹ Other workers in the guild of imperial weavers

require permission to leave what the Theodosian Code describes as an "ignoble status".⁴⁰

It will be noted that the *Notitia Dignitatum* applies a clear demarcation between weaving houses (*gynaecia*) and linen weaving shops (*linyfii*) and also purple-dye houses (*bafia*), as each involves differing and specialised skills. Organisationally these are kept separate, even though they are related and in the case of the purple-dye houses, all part of the same process of producing woollen cloth and garments. This no doubt reflects the structure of craft guilds.⁴¹

The actual nature of an imperial weaving house is unclear. But the previously cited references from Lactantius and Eusebius indicate it was a physical entity, probably including a number of different premises rather than a single building, and not merely an administrative unit. The use of prisoners in the imperial weaving houses tends to discount the proposition that they were just an agglomeration of home cottage industries, but the inclusion of home cottage industries as part of the overall process is likely from the passage from Sozomen (Salamanes Hermias Sozomenos c. 400 – c. 450 CE) referred to below. Hence the *gynaecia* was in all likelihood a combination of central facilities (where prisoners were used, and for storage and administration) and dispersed locations in houses and nearby farms with free artisans.⁴²

The system of *gynaecia* was supplemented by the *vestis militaris*, a cash tax levied on communities for the purpose of supplying clothing to the army.⁴³ This tax was still current in the era of Justinian, as evidenced by a number of imperial edicts included in the Codex of Justinian.⁴⁴ It is unclear whether this tax funded the operations of the *gynaecia*, or whether it funded the conversion of the cloth outputs of the *gynaecia* into garments, or it supplemented the output of the *gynaecia* from private sources.

Jones noted that the *fabricae* referred to in the *Notitia Dignitatum* provided high quality garments for civilian officials at court, but he did not suggest this was done by the *gynaecia*.⁴⁵ The location of the *gynaecia* near the frontiers may suggest this was not the case.⁴⁶ Also the existence of the separate Procurators of the Embroiderers of Gold and Silver may suggest that elite clothing was produced by them, rather than the *gynaecia*.

The Scale of Imperial Weaving Houses

Some indication of the size and scale of the imperial weaving houses can be obtained by estimates of troop numbers in the legions served by the individual locations. Further, the size and scale of the imperial weaving houses can be judged from a passage from Sozomen on a visit by the Emperor Julian to Cyzicus,

37 Wild 1976, 54; Lee 2007, 94.

38 Euseb., *Vit. Const.* 2.34; Cameron, Hall (trans.) 1999, 107.

39 *Cod. Theod.* 10.20.9; Pharr (trans.) 1952, 286.

40 *Cod. Theod.* 10.20.18; Pharr (trans.) 1952, 287.

41 Jones 1974, 356; Wild 1976b, 175; Benda-Weber 2016, 171.

42 Wild 2002, 29.

43 Lee 2007, 94.

44 *Cod. Iust.* 12.39.1–4; Frier (ed.) 2016, 2962–2965.

45 Jones 1964, 836–837.

46 Lee 2007, 94.

in Mysia (afterwards the capital of the Roman province of Hellespontus):

“There were, in fact, great numbers of artisans engaged in the woollen manufacture, and in the coinage of money; they were divided into two bands, and had received permission from preceding emperors to dwell, with their wives and possessions, in Cyzicus, provided that they annually handed over to the public treasury a supply of clothes for the soldiery, and of newly-coined money.”⁴⁷

This suggests the imperial weaving house had a large staff, and they were not small and modest establishments. There is an apparent disparity between the descriptions of *gynaecaea* between Lactantius and Eusebius on the one hand and Sozomen on the other, with the former suggesting a penal institution while the latter suggesting free skilled artisans, although both options could have been components within the broad umbrella of a *gynaecaea*. In the current instances, the texts are included for illustrative purposes with a critical analysis of these texts beyond the scope of this paper.

Belamarić states:

“The concentration of the labour force, the range of specialised jobs, the degree of organisation and their connection with urban centres makes them, in the judgement of historians, the closest to the modern industrial factory”.⁴⁸

Wild notes that an imperial weaving house would require administrative offices for the procurator and administrative staff, covered store rooms for the wool clip and warehousing for finished cloth, workshops for the weaving process (even if spinning may have been decentralised to women in the homes) given that there were slaves working in the weaving process, and living quarters for the slaves.⁴⁹ None of this suggests only a small cottage industry.

Two potential imperial weaving houses have been suggested to have been identified archaeologically, one in Split (Spalatum) in Dalmatia and the other in Carthage in Africa. Of these claims, one is possibly correct, while the other is most unlikely.

In Diocletian’s Palace at Split, Wilkes noted that the north western internal building could have been later adapted as an imperial weaving house after the death of Diocletian.⁵⁰ He writes:

“Nothing is known of the nature and scale of its operation”.⁵¹

The north western building was rectangular with dimensions of 60 m x 45 m with an upper storey.⁵² Little remains of the north western building, with most incorporated into later buildings.⁵³

Belamarić advances the case that the imperial weaving house was located in the north western building at the palace at Split, even during the period of Diocletian’s occupancy. He writes:

“...we can assume that in the north eastern block of the Split building a good part of the industrial process for the preparation of the cloth was performed, and that the weaving shops were located in the north west block. There are a series of unattractive archaeological traces of a *gynaecaeum*, which conventional archaeology, in the post-war decades in Split, certainly did not consider worthy of inspection. Records about the archaeological research in the northern part of the city hardly exist, and what we do know is extremely out of proportion with what we know about the southern and central parts of the palace”.⁵⁴

These “unattractive archaeological traces” are explained by Belamarić as follows:

“Unfortunately, there are practically no archaeological records of the small finds from investigations of the northern part of the Split building. But, during excavations of the crossing place of the *cardo* and *decumanus* (in order to establish the original level of the street and the Peristyle) Mate Suić in 1974 did observe, ‘a very thick layer of fine sediment of a markedly red colour of non-organic origin’, which had been deposited in the *cloaca*, and which had retained its intensity for centuries. This must prove the existence of a *fullonica*, which must have been located within the *gynaecaeum*. Of course, the question of what red sediment Suić really did find still remains: it is very likely some vegetable substitute for purple”.⁵⁵

If in fact the red colour was of non-organic origin, it cannot be a vegetable substitute for purple, and presumably was of mineral origin. The assumption is that the red colour establishes there was a dye house in the northern part of the palace at Split and hence there must be a weaving house nearby. The difficulty with that train of logic is that the *Notitia Dignitatum* does not identify an imperial dye house at Spalatum, but rather locates the imperial dye house at Salona and there is no general co-location of imperial dye houses in the same towns as imperial weaving houses in the *Notitia Dignitatum*. If there was an imperial weaving house at Split, it could only be located in one of the northern buildings of the palace, unless it was *extra muros*. Belamarić considers the location of an imperial weaving house in the palace is consistent with the concept of an imperial retirement home, illustrating the pragmatic nature of tetrarchic public works, with a balance of court, cult and production programs.⁵⁶ At best the claim for an imperial weaving house being located in the north western building at Split is possible, but lacks sufficient cogent proof.

In the British excavations on the north side of the Circular Harbour at Carthage, Hurst has tentatively suggested that the imperial weaving house may have been located there.

47 Sozom., *Hist. eccl.* 5.15; Walford (ed.) 1855, 225.

48 Belamarić 2004, 146.

49 Wild 1976a, 53.

50 Wilkes 1986, 41, 83.

51 Wilkes 1986, 83.

52 Wilkes 1983, 41.

53 Marasović 1995, 119.

54 Belamarić 2004, 153.

55 Belamarić 2004, 149.

56 Belamarić 2004, 157; 2019, 80–81.

Hurst is guarded in his conclusion:

“Archaeological evidence for such establishments (i.e. *gynaecium*) has never hitherto been found, so that all we can say is that the evidence from this site fits what we know from documentary evidence of the Carthage *gynaecium* and *gynaecia* generally.... That such an establishment should be located on the side of the Circular Harbour fits what we know of it as a whole”.⁵⁷

The archaeological evidence for spinning and weaving is limited to two contexts in Room 1 with finds of spindles, pins, spindle-whorls in level 4.16a, dated to the 2nd century CE and level 4.31a, dated to the 4th century.⁵⁸

The issue of concern is the size of Room 1 which is a rectangle of 8 m x 4 m or an area of 32 m².⁵⁹ Hurst responds to this concern as follows:

“How could weaving and spinning relate to the setting in Room 1? Looms can take up surprisingly little space: at Kairouan, the writer saw five large horizontal looms operating in a room measuring 5 m x 7 m; so there could have been more than one loom at work in Room 1 which was narrower but about the same length. Or perhaps only part of the space was perhaps given over to weaving”.⁶⁰

But the area of Room 1 at Carthage is minuscule compared to the area of the north western building at the Palace of Split and unlikely to be capable of providing the workplace space for the numbers of workers of an imperial weaving house suggested by Sozomen, let alone the Roman looms, the storage for raw wool and completed cloth. Based on this it appears unlikely that the Carthage location excavated by Hurst was an imperial weaving house. It is unlikely that the imperial weaving house would be located at the port, given that it did not rely of ship imported raw wool, and its production was directed at a local market, rather than exports. Additionally, Wilson has cast doubt on the presence of dyeing works at the site, further weakening the likelihood it was the imperial weaving house.⁶¹

The archaeological evidence from Carthage and Split on the scale of imperial weaving houses is equivocal and of no assistance in determining their scale. But the literary evidence referred to above makes it clear that imperial weaving houses were large scale industrial type enterprises.

Production Stages for Woollen Cloth and their Spatial Distribution

It is important to note the stages in the production of woollen cloth, so that the potential locations of each stage of the production process can be considered. Each of these stages are considered in detail by other authors and the details of these processes

do not require further consideration here.⁶² While the production stages are common to all manufacturing modes, the locations where each stage may differ according to whether the production is home-based, small scale, large scale and state owned.

The existence of a combination of home-based, small scale, large scale and state-owned production models for textile manufacturing means that evidence of spinning, weaving, fulling and dyeing is ubiquitous in Roman archaeology, although the small-scale model predominates.

There are differing views on the extent to which the manufacturing of woollen cloth was primarily a household enterprise in the Roman world. Moeller considers it was not,⁶³ while Flohr notes:

“So large-scale investment did appear in the Roman textile economy, but not everywhere and it did not grow at the expense of small-scale establishments, which remained in the norm and co-existed at the same sites”.⁶⁴

The principal stages in the production process are as follows:⁶⁵

- a) Shearing of the sheep;
- b) Washing of the Fleece;
- c) Dyeing of the fleece; It was Roman practice to dye the wool before spinning and weaving;
- d) Combing the wool;
- e) Spinning the wool into yarn;
- f) Weaving the cloth;
- g) Fulling the cloth;
- h) Additional dyeing;
- i) Garment manufacture.

For woollen cloth manufactured in an imperial woollen house, the shearing of sheep and an initial washing of the fleece would occur at the farm, while the site for any further washing and the dyeing of the fleece is unclear, but is likely to undertaken under the control of the imperial weaving house as an initial stage of production. The combing, spinning of yarn and the weaving of cloth would likely have occurred under the control of the imperial weaving house, although the combing and spinning may have been undertaken at dispersed locations under the control of the procurator of the imperial weaving house, while the weaving of cloth is likely to have occurred in the imperial weaving house. The fulling and additional dyeing would occur at the dye houses.

The location where these stages were undertaken differs in the manufacturing modes other than the imperial weaving houses mode.

57 Hurst 1994, 69.

58 Hurst 1994, 96–97.

59 Hurst 1994, 23, Fig 2.5.

60 Hurst 1994, 97.

61 Wilson 2004, 159–160.

62 Wild 1970.

63 Moeller 1976, 4–8.

64 Flohr 2014, 11.

65 Wild 1970, 23–83; 1976a, 51–52; Frayn 1984, 148–153.

Wool Trade in the Roman Empire

Given the conclusion that imperial weaving houses were industrial establishments of a significant scale, the question arises as to the extent to which wool for the production of utilitarian textiles at imperial weaving houses would be derived from long distant trade, regional trade or locally sourced. In order to establish what is the likely supply zone of imperial weaving houses located in Sirmium and Bassianae, consideration needs to be given to whether both of these weaving houses could have been supplied with raw material from a long distance.

As noted above, wool was transported off farm in bales made up a single rolled up fleece.⁶⁶ Today wool is pressed either by hand or mechanically into large bales of just under 0.5 m³ and weighing a minimum of 120 kg.⁶⁷ According to the Australian Association of Stud Merino Breeders, the first merino sheep introduced into Australia at the end of the 18th century were each able to produce a fleece of 1.5 – 2 kg per annum.⁶⁸ Wild cites weights for the fleece of Soay or Iron Age sheep from the Outer Hebrides as in the range of 1 – 2 lbs (or 0.45 – 0.9 kg).⁶⁹ Wild however considered that Orkney types of sheep were the standard breed in Roman Britain and he notes they produced fleeces weighing 1.0 to 1.5 kg.⁷⁰ With benefits of modern selective breeding, fleece weights have vastly increased up to 18 kg⁷¹, but a weight of around 1.5 kg may better accord to fleece weights in Roman times based on Wild's data. Hence fleece transport in the Roman period involves the transport of lightweight but potentially bulky cargo. Given the low wool yield of sheep in the Roman period compared to modern sheep, in the Roman period it would require up to 12 times the number of sheep to produce the same amount of woolen cloth as one modern sheep.

There would only be a requirement to import wool to Pannonia from distant sources if none were available locally, and this according to Wild was not the case for Roman Britain, North Gaul and Germany, and the same is likely to also apply to Pannonia.⁷²

In the case of textiles, this long-distance trade concentrated on finished textiles and garments.⁷³ In the case of finished textiles, Moeller suggests that Pompeii had a thriving textile industry for export while Jongman argues that textiles in Pompeii were largely produced for the local market.⁷⁴ However the issue at hand relates not the trade in textiles, but long distance trade in raw and washed wool. Diocletian's Edict on Prices provides some prices for largely washed wool, usually for speciality types but with a generic category for "all other wool, washed."⁷⁵ The Edict

contains detailed listings for various types of linen, particular items of made clothing, wages for fullers and weavers and the cost of shearing a sheep. It does suggest there was trade in high quality speciality types of wool as well as generic washed wool.

Strabo in discussing the exports from Turdetania in Spain writes:

"Formerly they exported large quantities of garments, but they now send the [unmanufactured] wool, which is superior even to that of Coraxi (people in the western Caucasus), and remarkable for its beauty".⁷⁶

There was long-distance trade in washed rather than raw wool in the Roman world, again probably but not exclusively focussed on higher quality wools⁷⁷.

There was significant water borne transport of goods on the Danube and Sava Rivers in the Roman period, particularly for the supply of frontier military forces⁷⁸ and for stone, building and construction materials⁷⁹. Remains of transport barges have been found downstream of the Iron Gates on the Danube⁸⁰ and at Sisak (ancient Siscia) on the Sava⁸¹ where the excavators considered the barge was used for the transport of perhaps brick or iron⁸². The long distant transport of washed wool on the Danube and Sava rivers for the manufacture of utilitarian garments is unlikely where there is adequate locally sourced product, although trade in higher quality fleeces could be expected. As Wilde notes: "There has been much debate on how far strictly local sources could provision the Roman frontier garrisons; the logistics and cost of transport alone would suggest that local sources were tapped first."⁸³

The products of the imperial weaving houses were largely of more utilitarian nature designed to meet the needs of the army. For these utilitarian needs, it is unlikely that the raw material for the imperial weaving houses at Sirmium and Bassianae was sourced by long distant trade, but rather was sourced from the regional catchments of those weaving houses.

If wool production for the making of utilitarian fabrics and garments was based distant from Sirmium and Bassianae in eastern or southern Serbia, wool is likely to have been transported to centres such as Naissus or Singidunum, both of which are better situated for the location of an imperial weaving house to process such wool than Bassianae. Finds of sheep bells, combs and shears are found in many villa sites in Bosnia and Herzegovina, indicating sheep grazing and wool production there.⁸⁴ But

66 See illustration in Wild 1970, Pl. XIII.

67 Australian Standard AS2001.2.9 and AWEX Code of Practice.

68 Australian Association of Stud Merino Breeders 2016.

69 Wild 1970, 7.

70 Wild 1982, 112; 2002, 2.

71 Australian Association of Stud Merino Breeders 2016.

72 Wild 1970, 10.

73 Moeller 1976, 6; Flohr 2014, 8; 2016, 51.

74 Moeller 1976; Jongman 1991, 202–203; Flohr 2013.

75 *Edictum de pretiis rerum venalium*, 25.1.5; Kropff (trans.) 2016; Wild 2015, 11–15.

76 Strab. 3.2.6; Hamilton, Falconer (trans.) 1903, 216–217.

77 Wilde 2002, 5, 30.

78 Ilić, Golubović, Mrđić 2011.

79 Djurić 2019; Đurić *et al.* 2006; 2007; Rižnar, Jovanović 2006.

80 Bockius 2003.

81 Gaspari, Erić, Šmalcelj 2006.

82 Gaspari, Erić, Šmalcelj 2006, 288.

83 Wilde 2002, 32.

84 Busaladžić 2011, 88–89.

if wool production for utilitarian purposes was primarily based in western Serbia and Bosnia distant from the Glac Study Area, wool is likely to have been transported along the Drina and Sava Rivers to Sirmium, which is better located for an imperial weaving house and where one was located, rather than being transported further to a location such as Bassianae. Hence it is most likely that raw wool supplies for utilitarian purposes for the two imperial weaving houses at Sirmium and Bassianae would have been sourced from the areas immediately adjacent to those centres.

In addition to the *gynaecea* there was a State-run system for the production of specialised luxury items under the Procurators of the Embroiderers of Gold and Silver (although what was done appears not be embroidery, but the weaving of gold and silver threads in the making of cloth) and not under the Procurators of the Imperial Weaving Houses. It appears that they were separate institutions from the *gynaecea*.

The *Notitia Dignitatum* includes the following for the Western Empire:

*“Praepositi branbaricarium siue argentarium:
Praepositus branbaricarium siue argentarium Arelatensium.
Praepositus branbaricarium siue argentarium Remensium.
Praepositus branbaricarium siue argentarium Tribero-
rum.”*⁸⁵

The English translation is as follows:

“Procurators of the embroiderers in gold and silver:
The procurator of the embroiderers in gold and silver at Arles,
The procurator of the embroiderers in gold silver and at Rheims,
The procurator of the embroiderers in gold and silver at Trier.”⁸⁶

It is noted that there were no procurators for the embroiderers in gold and silver in any of the Pannonian provinces or Dalmatia. They were only in Arles, Rheims and Trier in the west (cities in which a *gynaeceum* was also located), and by 374 CE there were factories in Constantinople and Antioch and for the eastern diocese, the *Notitia Dignitatum* locates them in every eastern diocese other than Thrace and Illyricum which shared one factory.⁸⁷ The Theodosian Code provided for an exclusive State monopoly for the production of such garments. In a decree by Valentinian and Valens in 369 CE it provides: “We forbid the weaving or making for private use of borders of gold or of silk interwoven with gold on garments for either men or women, and we command that such garment-borders be only made in Our weaving establishments.”⁸⁸ The specialised craftspersons manufacturing such luxury items were known as *barbaricarii*.⁸⁹ These skilled workers came under a separate procurator to the imperial weaving houses, given they were utilising valuable materials and their

products were for the imperial family, the military elite and high dignitaries.⁹⁰ Rollason documents the use of elite clothing to buttress the wearers’ authority and the role of gifts of elite male clothing in late antiquity, but there is no indication that these prestigious and luxurious items were the product of the *gynaecea* system.⁹¹

Sheep Grazing and local Agricultural Enterprises

With two imperial weaving houses in close proximity to the Glac Study Area, it is important to understand the nature of sheep grazing in the Roman Empire and what it would mean for agricultural land use and the nature of agricultural enterprises in the supply zone of an imperial weaving house.

Sheep grazing in the Roman period in Italy has been extensively studied by Frayn, and there appears to be no basis that her conclusions would not be equally applicable to grazing practices in the supply zones for the imperial weaving houses at Sirmium and Bassianae.⁹² Traditionally sheep were grazed on lands regarded as unsuitable or uneconomic for growing crops. The free-range wandering of flocks of sheep is incompatible with settled farming communities engaged in cropping. Hence to maintain large flocks of sheep required access to grazing lands, either owned by the flocks’ owner, rented from other landowners, imperial estates or other public lands. Frayn identified three models for animal husbandry farming in Roman Italy.⁹³ These are:

- a) Small farmers, who are primarily engaged in cropping, but keep a flock of c. 100 sheep for their own subsistence, which are grazed on fallow land or after harvesting of crops.
- b) Owners of large estates, with their own fields and flocks, the so-called *latifundia*.
- c) Entrepreneurs in the speculative business of grazing sheep, the so-called *pecuarii*, who own large landholdings and large flocks and who rent pastures or rent out sheep.

The last two models are essentially ones of transhumance involving the seasonal movement of livestock from one pasture ground to another. Additionally, there is the model of large imperial estates leased for sheep grazing as indicated in the so-called ‘Saepinum Inscription’ which was inscribed during the reign of Marcus Aurelius on the outer wall of a monumental gate in the town of Saepinum, in central Italy. This records a dispute between the transhumance shepherds using imperial estates and the municipal magistrates.⁹⁴

The identification of farms used for sheep grazing will be often subtle, with indicators being sheds for keeping animals and open-air stockyards or enclosures. Also, the relationship be-

85 *Not. Dign. [Occ.]* 11.74–77; Seeck (ed.) 1876, 152.

86 *Not. Dign. [Occ.]* 11.78–83; Seeck (ed.) 1876, 152; Fairley (ed.) 1899, 32.

87 *Not. Dign. [Or.]* 11.45–49; Seeck (ed.) 1876, 33.

88 *Cod. Theod.* 10.21.1; Pharr (trans.) 1952, 288.

89 Kazhdan 1991, 253; Sinnigen 1963; Dumitrache 2018, 24.

90 Speidel 1997, 232.

91 Rollason 2016.

92 Frayn 1984.

93 Frayn 1984, 123.

94 CIL 9.2438; Mommsen (ed.) 1883, 228; Corbier 1983; Wells 1992, 85.

tween high-status villas and farmsteads may not be that of separately owned and operated units, but one of satellite or subsidiary farmsteads to a high-status villa of the *latifundia* owner. This could apply whether the *latifundia* was involved in large scale sheep grazing or just large-scale cropping.

Rossiter wrote:

“The larger the estate, however, the less practicable it would have been to farm the land from a central location. The *latifundia* of the Imperial Age, many of which were probably operated by the absorption of smaller holdings and farmsteads spread over the extent of the estate and operated by tenant *colonii*”.⁹⁵

The grazing of large flocks of sheep would require shepherds. Columella noted that one shepherd is needed for every 20 sheep and that flocks could run into many thousands.⁹⁶ Annual shearing was undertaken between the end of March and the end of June.⁹⁷ Shearing would be undertaken in pens outdoors and the freshly shorn fleeces were given a preliminary washing usually on the farm.⁹⁸ For fleeces destined for the imperial weaving house, this is the end of the on-farm processing. Individual fleeces were then rolled up to form a bale for transport.⁹⁹

Archaeological Evidence for Sheep Grazing in Roman Southern Pannonia

Today the Glac Study Area is overwhelmingly cleared land intensively cropped for wheat and maize, except for the forested area in the north in the Fruška Gora mountains. Sheep are largely absent from the landscape, with the exception of a large flock utilising the disused environs of the defunct factories to the east of Sremska Mitrovica and a few sheep held by small landowners. The current nature of agricultural land use and the land itself has prompted doubts as to whether the area was a source of wool production.

Wild notes:

“The strategic importance of the weaving-mills in the Illyrian diocese is self-evident, but their economic base is less clear”.¹⁰⁰

In the case of the imperial weaving houses at Split and Salona, Belamarić writes:

“There was raw material in Dalmatia within reach. Immediately following the Second World War there were about one million sheep in the central hinterland of the Adriatic coast. The inhabitants of Dalmatian towns in the Roman period probably, like those in Istria, bought wool from the local tribes of the mountainous interior, and also possessed flocks of sheep themselves, looked after by their slaves”.¹⁰¹

Like many towns in the Roman world, there is evidence of local textile crafts in Roman Siscia, where over one thousand lead tags have been found in the harbour of Siscia on the Sava River indicating the presence of fulling and dyeing facilities there and a 3rd century CE altar to Hercules dedicated by the decurion of Siscia, Gaius Ingenuius Rufinianus, and his sister, where the benefactor is referred to as the Prefect of the Guild of Textile Dealers (*collegia centonariorum*).¹⁰² Radman-Livaja concludes the importance of these finds should not be over-estimated, but:

“...they confirm that the city had fairly well-developed facilities for amenities relating to textile crafts, although we are still lacking reliable data about the number or size of such facilities”.¹⁰³

At several archaeological sites closer to Sirmium and Bassianae, tools for wool processing dated in the Roman period have been found. Two pairs of shears for wool (*forpex* or *forfex*¹⁰⁴) are known from the Gomolava site at Hrtkovci which is situated south-east of Sremska Mitrovica.¹⁰⁵ Wool shears are also found at the site of Avlije in Klenje village next to the south-western periphery of the Glac Study Area.¹⁰⁶ Several examples are known from the sites at the *limes*, found in a Late Antique context.¹⁰⁷ At the site of Milištanska Kosa near Vladimirci village which is situated next to the south-eastern periphery of the Glac Study Area, a wool comb (*scalptorium*) was found in a hoard of tools.¹⁰⁸ Blade shears for shearing sheep are recognisable from their crude workmanship and large size; while both bow-shaped shears and pivot shears are known from the Roman period, finds from Bosnia and Herzegovina from Županjac – Delminium, Proboj near Ljubuški, and Stup near Sarajevo are all bow shears.¹⁰⁹

From Šašinci north-east of Sremska Mitrovica, at the Kudoš site, a find of a small disk used on a loom was found, but the find could belong to an earlier context of later prehistory.¹¹⁰ It is noted that by the 3rd century CE the use of a vertical loom with two beams was in widespread use in the Roman world, obviating the use of loom weights. Prior to this loom weights in Roman Pannonia were generally pyramidal rather than donut or disc-shaped.¹¹¹

Finds of wool processing tools in the area and its proximity, while present, are scarce, and because utilitarian objects such as wool shears, combs and disks for looms had similar forms in different periods, the absence of a precise context of such finds makes it difficult to date the objects.¹¹² But there were clearly sheep present to support a local textile industry in the Sava River basin in the Roman period.

95 Rossiter 1978, 34.

96 Columella, *Rust.*, 7.3. Boyd (ed.) 1954, 237–257.

97 White 1970, 305.

98 Wild 1970, 22–23.

99 Wild 1970, 23; Frayn 1984, 157.

100 Wild 1976a, 54.

101 Belamarić 2004, 152.

102 Liu 2009; Radman-Livaja 2018, 154–158.

103 Radman-Livaja 2018, 160.

104 Popović 1988, 96.

105 Dautova-Ruševljan, Brukner 1992, 89.

106 Ropkić 2016, 111.

107 Popović 1988, 96–98; Ilić 2012, 159.

108 Ilić 2012, 158; Ropkić 2016, 111.

109 Busaladžić 2014, 88–89, 309, Table 80.

110 Popović 1967, 3.

111 Wild 2002, 10–11; Pásztoókai-Szeőke 2013; Öhrman 2019.

112 Wild 1970, 22–23, fn. 1.

In the anonymous text, the *Expositio totius mundi at gentium* (A description of the world and its people) dated to 350 – 353 CE it is stated:

“Then there is Pannonia, a land rich in all things – crops, livestock, slaves, and a little trade”.¹¹³

This description predates the raids by the Sarmatians in 374 – 375 CE and Gothic incursions after the Battle of Adrianople in 378 CE, as so likely reflects the conditions in those times, suggesting that the grazing of livestock was important in the Sirmium region. The author refers regularly to *iumentum* (livestock) and so it is unclear if this includes sheep as well as cattle, and intriguingly there is no mention of sheep or wool in the context of Pannonia, nor any other region of the Empire except for Sicily.¹¹⁴

Indirect evidence supporting the likelihood of local wool production in Pannonia is found in the morphological changes in sheep found in the Roman times, suggesting selective breeding. The zooarchaeological studies from sites in Sirmium and its surroundings show that the height of sheep increased and the shape of the skull changed in the Roman times comparing to the autochthonous species.¹¹⁵ Sheep skeletal remains dated in the Roman period and originating from several locations in the area have been studied and are noted in: Sremska Mitrovica, Vranj, Krnješevci, Prhovo, Pećinci, Ruma, Šašinci, Adaševci, Kuzmin, Gomolava.¹¹⁶

The height differences between the sheep species may be up to 10 cm, with new strains probably imported from Greece for local breeding in Pannonia.¹¹⁷ The wool quantity per animal was increased. An examination of animal husbandry practices in Catalonia in the Iberian Peninsula during the Roman period indicates that from the 3rd to the 1st century BCE, sheep and goats predominate over cattle and pigs, but from the 1st century CE cattle and pigs were as numerous as sheep and goats and by the 3rd century CE cattle predominate.¹¹⁸ Mortality profiles indicate that sheep and goats were used for wool and milk, but from the 4th century CE they were increasingly exploited for meat, whereas cattle were used more for traction and probably milk, with this trend more pronounced in the late Roman period.¹¹⁹ Biometric analysis shows an increase in the size of sheep and cattle in the 1st century CE due to the importation of new bloodstock.¹²⁰ These patterns are evident in other parts of the Roman empire in northern Europe¹²¹, and it appears that these patterns were also present in Pannonia.

Hence the archaeological evidence to date is equivocal, neither confirming nor denying that sheep grazing was an important element of the rural economy of Pannonia in the Roman period.

Environmental Conditions for Sheep Grazing near Sirmium and Bassianae

An important factor that needs consideration is the environmental conditions of the Sirmium and Bassianae region in the Roman period. The Sava River basin appears historically to have contained significant areas of wetlands. Ancient authors (Appian, Cassius Dio, Florus, Pliny the Elder, Strabo, etc.) refer to Pannonia as land rich in marshes, forests, and with cold climate.¹²² The modern-day landscape is largely the product of extensive drainage works undertaken in the 18th century during the reign of the Habsburg Empress Maria Theresa (1717 – 1780) and during the Kingdom of Serbia, leaving the current agricultural landscape in the Sava alluvial plain and terrace crisscrossed by an extensive network of drainage channels. In the Roman period, the area was notable for its marshes with the *Historia Augusta* in the life of the Emperor Probus stating:

“When he had come to Sirmium, desiring to enrich and enlarge his native place, he set many thousand soldiers together to draining a certain marsh, planning a great canal with outlets flowing into the Save, and thus draining a region for the use of the people of Sirmium”.¹²³

This canal is that running from Bassianae to Jarak on the eastern edge of the Glac Study Area. Menander the Guardsman in the context of the preparations of the Avars to take Sirmium between 579 and 582 CE refers to the “isle of Sirmium” suggesting the city and its wider area were surrounded by rivers and swamps.¹²⁴

While today sheep are characterised as animals which graze on rocky and mountainous areas, areas for grazing tend to be areas where cropping is neither feasible or practical, factors which would also apply to marshy areas. Modern wool production is mainly centred on the Merino and Romney breeds which are well suited to dry and subtropical areas, but in Europe sheep were also well adapted to cold and wet inhospitable regions.¹²⁵ This is well illustrated by wool imports into Britain in the 19th century. In 1831 the largest source of wool imported into Britain came from Germany with 71% of the import trade, compared to Spain (11%) and Australia (8%).¹²⁶ The German wool came principally from Lower Saxony, an area replete with wetlands and marsh-

113 *Exp. Tot. Mun.*, 14; Woodman (trans.) 1964, 42; Rougé 1966.

114 Grüll 2014, 635–636.

115 Blažič 1993; 1995, 340; Nedeljković 2009, 21–22; Vuković-Bogdanović 2017, 104.

116 Dautova-Ruševljan, Brukner 1992; Blažič 1993; 1995, 340–343; Gilić 1997; Nedeljković 2009; 2016.

117 Bökönyi 1974, 177–179; 1982; 1984.

118 Colominas, Sana 2009, 13.

119 Colominas, Sana 2009, 15; Colominas et al. 2019, 72.

120 Colominas, Sana 2009, 16–18.

121 Colominas, Sana 2009, 21; Rizzetto, Crabtree, Albarella 2017.

122 Domić Kunić 2006, 60, 161.

123 *Hist. Aug., Probus* 21.2; Magie (trans.) 1932, 379–380.

124 *Men., fr.* 25.2.70–; Blockley (trans.) 1985, 226, 227.

125 Aitken 2007, 4.

126 McLean 2013, 58.

lands. Within the Sirmium and Bassianae region, sheep potentially would have been suited for grazing in the Fruška Gora mountains and their foothills and slopes and in marshy areas in the alluvial plain and terraces of the Sava river, plus on fallow fields and cropping fields after harvesting had occurred.

The range of ecotones suitable for sheep in the Glac Study Area would be suitable for a transhumance model by large estates (*latifundia*) or by speculators (*pecuarii*), using a large villa and subsidiary farmsteads as a base and grazing in mountainous and marshy areas, fallow fields and fields post-harvest, using a combination of land owned by them, lands rented and imperial estates.

Conclusion

The presence of two imperial weaving houses at Sirmium and Bassianae contemporaneously as likely evidenced by the *Notitia Dignitatum* represents an unprecedented and significant concentration of state-owned enterprises producing textiles for the military near the Glac Study Area. Imperial weaving houses were likely to be large scale industrial type enterprises. The raw wool to supply these imperial weaving houses is likely to have been sourced locally in the area around Sirmium and Bassianae.

The need to supply wool for these weaving houses is likely to have either influenced or reflected the nature of agricultural activities in the area and the balance between cropping and pastoral undertakings. This provides some potential insights into the nature of the agricultural landscape during the Roman period. Available archaeological information on the rural economy and landscape in the area around Sirmium and Bassianae is not inconsistent with the likely implications of the presence of imperial weaving houses in both centres, but at present is not determinative and given its nature may never be capable of clear discernment from the archaeological evidence alone.

This highlights the important role played by written sources such as the *Notitia Dignitatum* in enabling us to re-imagine the Roman rural economy and landscape in a sharper focus than could be provided by the physical evidence alone and in providing models for the rural economy and landscape which can be tested against the archaeological record.

SAŽETAK

NOTITIA DIGNITATUM, ISPAŠA OVACA, PROIZVODNJA VUNE I TKANINA TIJEKOM RIMSKOG CARSTVA U OKOLICI SIRMIIJA U PROVINCIJI PANNONIA SECUNDA

U sklopu australsko-srpskog arheološkog projekta Glac, od 2017. godine provode se terenska rekognosciranja okolice antičkog Sirmija, u dijelovima definiranog istraživačkog područja s lijeve i desne strane rijeke Save (700 km²), a s ciljem interpretiranja uvjeta prirodnog okoliša i ruralnog gospodarstva u vrijeme Rimskog Carstva.

Kao dio istraživanja ispitana su literarna i epigrafska svjedočanstva, uključujući i dokument *Notitia Dignitatum*, službenu upravnu listu s administracijskom podjelom Rimskog Carstva iz 5. stoljeća.

Posebnu pozornost istraživača privlači sadržaj Glave XI tog dokumenta, gdje se navode dvije carske tkalačke tvornice (*gynaecea*) na istoku provincije Druge Panonije (*Pannonia Secunda*), u gradovima *Sirmium* i *Bassianae*. Istovremenost i relativno mala udaljenost između dvije tvornice (svuga 27 km) presedan je u upravnoj organizaciji Rimskog Carstva, a veličina i značaj grada *Bassianae* (18 ha) upadljivo su manji u usporedbi sa drugim centrima navedenim u dokumentu. Ove činjenice ukazuju na moguće implikacije na izgled prirodnog okoliša i ruralno gospodarstvo na prostoru između dva antička grada, u definiranom istraživačkom području projekta Glac.

Načelno, postojanje carskih tkalačkih radionica na relativno malom prostoru može se povezati sa:

- a) dostupnošću sirovina za tkanje, tojest ispašom ovaca i korištenjem vune;
- b) lokalizacijom potrošača proizvoda od vune tkane u carskim tvornicama, prije svega rimske vojske.

Dodatni kriterij za određivanje mjesta carskih tkalačkih radionica mogao je biti postojanje gradova kao administrativnih centara.

Ispitivanjem arheoloških analogija i literarnih svjedočanstava zaključuje se da ovakav tip proizvodnog pogona svakako predstavlja fizički entitet a ne isključivo administrativno-organizacijsku jedinicu; to jest, takva tvornica je predstavljala pogon industrijskog tipa koji je između ostalog uključivao i rad robova i pritvorenika. Analizom faza u proizvodnji tkanina i odjeće od vune, ustanovljeno je da su se tek prve dvije obavljale na mjestima uzgoja ovaca (šišanje i pranje vune na farmama), dok su ostale aktivnosti bile pod kontrolom carskih tvornica. Imajući u vidu razmjenu i promet vune na širem prostoru Rimskog Carstva, kao i utilitarnu prirodu masovnih produkata carskih tkalačkih radionica, zaključuje se da je proizvodna sirovina nabavljana u njihovoj neposrednoj okolini.

Na lokalni uzgoj ovaca u okolici Sirmija također upućuju arheozoološki nalazi i primjerci alata za obradu vune. Na ovu aktivnost upućuju i značajke prirodnog okoliša.

Uzgoj ovaca se poglavito provodi u oblastima gdje je manje mogućnosti za zemljoradnju. Najčešće su to brdsko-planinski predjeli, ali svakako su to mogli biti i nizinski predjeli gdje su uslijed određenih prirodnih karakteristika ograničene zemljoradničke aktivnosti. Upravo takve značajke karakteriziraju okolicu Sirmija u kasnoj antici, a koja je svoj sadašnji poljoprivredno-zemljoradnički izgled dobila tek u moderno doba. Iz pisanih vrela saznajemo da je okolica Sirmija u antičko doba zapravo močvarno područje, i kako je tek rimski car Prob (276. – 282. g.) djelomično isušio prostor prokopavanjem kanala; dok je daljnja modifikacija krajolika uglavnom okončana u vrijeme habsburške carice Marije Terezije u 18. stoljeću, i kasnije u 19. stoljeću.

Prisutnost dvije istovremene carske tkalačke tvornice u gradovima *Sirmium* i *Bassianae* upućuju na proizvodnju tkanina i odjeće od vune velikih razmjera na ovom području, poglavito za potrebe rimske vojske na Dunavskom limesu. Sirovina je po svemu sudeći nabavljana u neposrednoj okolini Sirmija.

Ove činjenice ukazuju na prirodu poljoprivrednih aktivnosti u vrijeme Rimskog Carstva i na odnos zastupljenosti zemljoradnje i stočarstva na prostoru antičkog Sirmija.

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