

The Economy of Medieval Hungary

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Contents

Note on Names	IX
Acknowledgements	X
List of Figures and Tables	XII
Abbreviations	XVI
Notes on Contributors	XVII

Introduction: Hungarian Medieval Economic History: Sources, Research and Methodology 1

József Laszlovszky, Balázs Nagy, Péter Szabó and András Vadas

PART 1

Structures

- 1 Long-Term Environmental Changes in Medieval Hungary: Changes in Settlement Areas and Their Potential Drivers 39
László Ferenczi, József Laszlovszky, Zsolt Pinke, Péter Szabó and András Vadas
- 2 Demographic Issues in Late Medieval Hungary: Population, Ethnic Groups, Economic Activity 48
András Kubinyi and József Laszlovszky
- 3 Mobility, Roads and Bridges in Medieval Hungary 64
Magdolna Szilágyi

PART 2

Human-Nature Interaction in Production

- 4 Agriculture in Medieval Hungary 81
József Laszlovszky
- 5 Animal Exploitation in Medieval Hungary 113
László Bartosiewicz, Anna Zsófia Biller, Péter Csippán, László Daróczi-Szabó, Márta Daróczi-Szabó, Erika Gál, István Kovács, Kyra Lyublyanovics and Éva Ágnes Nyerges

- 6 Mining in Medieval Hungary 166
Zoltán Batizi
- 7 Salt Mining and Trade in Hungary before the Mongol Invasion 182
Beatrix F. Romhányi
- 8 Salt Mining and Trade in Hungary from the mid-Thirteenth Century until the End of the Middle Ages 205
István Draskóczy
- 9 The Extent and Management of Woodland in Medieval Hungary 219
Péter Szabó
- 10 Water Management in Medieval Hungary 238
László Ferenczi

PART 3

Money, Incomes and Management

- 11 Royal Revenues in the Árpadian Age 255
Boglárka Weisz
- 12 Seigneurial Dues and Taxation Principles in Late Medieval Hungary 265
Árpád Nógrády
- 13 Minting, Financial Administration and Coin Circulation in Hungary in the Árpadian and Angevin Periods (1000–1387) 279
Csaba Tóth
- 14 Coinage and Financial Administration in Late Medieval Hungary (1387–1526) 295
Márton Gyöngyössi

PART 4

Spheres of Production

- 15 The Ecclesiastic Economy in Medieval Hungary 309
Beatrix F. Romhányi

- 16 **The Urban Economy in Medieval Hungary** 335
Katalin Szende
- 17 **The Medieval Market Town and Its Economy** 359
István Petrovics
- 18 **Crafts in Medieval Hungary** 369
László Szende
- 19 **The Economy of Castle Estates in the Late Medieval Kingdom of Hungary** 394
István Kenyeres

PART 5
Trade Relations

- 20 **Domestic Trade in the Árpadian Age** 419
Boglárka Weisz
- 21 **Professional Merchants and the Institutions of Trade: Domestic Trade in Late Medieval Hungary** 432
András Kubinyi
- 22 **Import Objects as Sources of the Economic History of Medieval Hungary** 455
István Feld
- 23 **Foreign Trade of Medieval Hungary** 473
Balázs Nagy
- 24 **Foreign Business Interests in Hungary in the Middle Ages** 491
Krisztina Arany
- Appendix** 509
- List of References** 511
- Index of Geographic Names** 625
- Index of Personal Names** 636

Salt Mining and Trade in Hungary before the Mongol Invasion

Beatrix F. Romhányi

Salt has always been one of the fundamental elements of sustenance. Not only do human beings need it, but animals and even plants, too. Carnivores get the salt they need from the blood of their prey, while herbivores and plants depend on other sources. Domesticated animals may obtain some of the salt they need with fodder, but in historical times their needs were mainly satisfied by grazing. Pasture near the sea contains more salt than continental pasture, which affects ingestion and milking capacity, especially of cattle and sheep. The use of salt deposits and salt-ponds can be proven at least since the Bronze Age, but in certain cases even from the Neolithic. Salt can be extracted from sea water (salt-ponds) or mined out of sedimentary salt deposits. Major areas where salt was made through evaporation include Italy (near Venice), Dalmatia, some of the Mediterranean islands (Sicily, Sardinia, Mallorca), Spain (Catalonia, Biscay), the Camargue, along the Atlantic Coast in Aquitaine and Brittany, southern England (Plymouth) and southern Ireland. Salt-ponds also existed on the northern shore of the Black Sea, as well as in and around the Crimea. Salt deposits can be found in certain regions of Germany, as well as in the Alps (in the region of Salzburg), in Soest, and the region of Halle an der Saale in Lüneburg. Important sites were located in Catalonia near Barcelona, and in English Droitwich (as mentioned in the Domesday Book), but smaller mines were known in Bosnian Tuzla (the name itself means salt) and in Solivar near Prešov (modern Slovakia) too. These mines produced salt in furnaces; i.e., solubilized rock salt or brine was boiled until pure cooking salt was obtained. Two further European mining regions should be mentioned here: Transylvania and Maramureş, and the salt mines of Wieliczka and Bochnia in Poland. The latter mines were intensively cultivated only from the second third of the thirteenth century. The specialty of these mines was that the salt occurred there in the form of almost pure halite, thus could be used directly. This also meant that pieces of salt (blocks or drums) were cut in the mines¹ and sold in this form to

1 Cf. in *partibus Transiluanis sunt maximi montes de sale, et de illis montibus cauatur sal sicut lapides* – Górka (ed.) 1916, 46.

customers. Although many salterns were known from prehistoric times, they were not in use continuously: whether salt was extracted at a given site in a given period depended on demographic conditions, political circumstances and transport opportunities. Since salt did not spoil, it could substitute for money (until very recently, salt was frequently used in lieu of money as salary). However, unlike gold and silver, salt is used in consumption, and cannot be hoarded as treasure.

Early Salt Mining in Transylvania

The most important salt mines of the Carpathian Basin are in Transylvania and in the region adjacent to Maramureş. The major sites are Dej, Sic, Cojocna, Turda, Ocna Mureş, Ocna Sibiului, the 'Sóvidék' ("salt country") around Sărăţeni, and Sărata near Bistriţa in Transylvania, and around Coştiui in Maramureş. The latter salt region extends from Şugatag (Romania) to Solotvino (Ukraine), and is associated with several mines. The first traces of salt exploitation in Transylvania date back as far as the prehistoric times: in the Maramureş region, finds from the Bronze Age testify to early mine working.² The sites were known about throughout the last seven or eight thousand years, but this does not mean that they were in constant use. After the Roman occupation of Dacia, not only were metals extracted from the mountains, but also salt. Sărăţeni was called *Castrum Salivum* and was the center of salt administration in Roman Dacia. Archaeological evidence shows that the mine of Turda (Roman Potaissa) was also exploited. The Roman Empire tried to control trading routes even after it was forced to evacuate the province: recent archaeological research suggests that the gates of the amphitheater of Sarmizegetusa were blocked in the fourth century, indicating the presence of a Roman population even after the Roman military had left. Economic activity at the settlement is proved by the presence of Roman coins dating to the second half of the fourth century.³ In the Migration Period, the Gepids (fifth–sixth centuries) and the Avars (sixth–eighth centuries) held the mines in Northern and Central Transylvania (cf. the two hoards found at Şimleu Silvaniei, the princely burials of Apahida, and the late Avar burials; e.g. at Câmpia Turzii). In the ninth century, the Bulgarians occupied some strategic points in southern Transylvania in order to control the mines of the region. Cemeteries for this population have

2 Bánffy 2015 for further literature on prehistoric salt mining. On the Bronze Age, see also T. Németh 2013.

3 Găzdac and Cociş 2004, 4, 17 and 21.

been discovered, for instance, in Alba Iulia, Blandiana and Zeligrad.⁴ Their presence is also attested to in 892 when – according to the *Annales Fuldenses* – the Carolingian emperor Arnulf asked the Bulgarians to hinder salt transports for the Moravians.⁵ Similarly, in the late ninth and tenth century the Hungarian elite took hold of the territories around Cluj and Turda, as reflected in the early Hungarian burials with horse and weapons in this area.⁶ Medieval exploitation of the mines in the Maramureş region started in the thirteenth century. We do not have sources concerning the organization of salt exploitation and trade before the year 1000, but we assume that the mines became royal estate after the foundation of the Hungarian Kingdom.

Salt Exploitation in the Early Árpáadian Age

Since salt was one of the most important minerals and trade goods of the Carpathian Basin, historians dealt with it as early as in the 1880s, although only in the context of the history of mining,⁷ or of the economy of the medieval Hungarian Kingdom in general.⁸ The first comprehensive piece of research on the Árpáadian-age salt exploitation and salt trade was an article by Oszkár Paulinyi, who mainly clarified the evolution of *ius regale* on salt, but also dealt with the relevant parts of the so-called Oath of Bereg.⁹ His interpretation was widely accepted until recently.¹⁰ We do not have evidence about the eleventh and early twelfth century organizations through which salt was distributed. The profitability of the salt trade is reflected in the law of King Coloman who ordered the payment of tithes after toll and salt incomes.¹¹ The first element in the distribution system, Sălacea, is first referred to in 1067, but further hints to the existence of the royal salt depots emerged only from the twelfth century onwards (e.g. at Sâmbăteni, Arad, Szeged, and Vasvár). During the reign of King Andrew II, several depots are mentioned in the sources, some of them on the borders of the Kingdom (Bratislava, Sopron, Vasvár, and an unnamed depot in

4 Bóna 1987, 190. On the Bulgarian presence in the Carpathian Basin, see also Katona Kiss 2009. The name Zeligrad is of Bulgarian origin, meaning castle of salt.

5 Pertz (ed.) 1891, 121.

6 Gáll 2013, 656.

7 Wenzel 1880, 20–21 and Iványi 1911.

8 Hóman 1921, 14.

9 Paulinyi 1924, esp. 640–643.

10 Draskóczy 2008, with further literature.

11 Bak et al. (eds.) 1992–2012, I, 27 (Colom. §25).

Zala County¹²), along with others in the core territories (Sălacea, Szeged, and Székesfehérvár).

The existence of an early royal monopoly on salt appears to be supported by an incident which occurred between King St Stephen and the lord of the Maros Region, Ajtony, when the latter – allegedly – broke the law by hindering the transport of royal salt and imposing tolls on it at the riverside.¹³ However, the story is known only from the Legend of St Gerhard, and this fact reminds the researcher to be very careful: the final version of this text was compiled in the fourteenth century, the earliest parts being from the twelfth century, but it also contains some elements dating back to the eleventh.¹⁴ The main question is whether the relevant section can be dated to the early period.

Broad consensus also exists about the Oath of Bereg. The charter describes a royal donation of salt to a number of church institutions, mainly located along the Maros River.¹⁵ This privilege is usually interpreted to mean that the different bishops, collegiate chapters and abbeys received the salt so that they could sell of their own volition. But does this interpretation really capture the meaning of the original text? Or was the donation part of a longer-lasting arrangement in Hungary? The number of complementary sources is rather limited; however, it is worth analyzing them using a common framework to better understand the system and help decide – if it is possible – what the intent of the 1233 charter was, and whether the privilege granted by the legate Jacopo Pecorari and sealed by King Andrew II survived throughout the following decades.

In total, we can identify about a dozen privilegial charters to church institutions from before the year of the Oath of Bereg that in some way refer to salt-related donations. Three of them are dated to the eleventh century. According to the foundation charter of the Benedictine Abbey of Pécsvárad (1015), the founder, King St Stephen, awarded significant salt-related privileges to the monastery, including the freedom to mine, transport and trade, without restrictions on quantity.¹⁶ Alas, the charter is interpolated and was compiled

12 Karácsonyi and Borovszky (eds.) 1903, §277.

13 Madzsar (ed.) 1938, 489–490. Most probably, Ajtony imposed toll on the royal salt carried on land road from Sălacea or Csongrád to the south at the fords of the Maros River.

14 Madzsar (ed.) 1938, 464–466.

15 Knauz et al. (eds.) 1874–1999, I, 448. About medieval regulations concerning salt, see Kubinyi 1991d.

16 †1015: Györffy (ed.) 1992, 63–80 (with a detailed critical evaluation of the text). The formulation is very odd, and has no parallel in medieval Hungarian charters. It is also suspicious that neither the site of the salt mine, nor the quantity of salt are indicated. Furthermore, there is no reference to transportation.

in the 1220s according to the model of the privileges of the Pannonhalma Abbey. The relevant section is certainly false.

Another charter that mentions a donation of salt income dates from 1075: the foundation charter of the Hronský Beňadik Abbey. According to the text, King Géza II gave the abbey the toll paid after salt near Turda (in relation to its transport [?]).¹⁷ In this case, it is clear that the monks were not directly involved in the salt business, but received some income from it in terms of money or in kind. Furthermore, according to the opinion of Boglárka Weisz based on two thirteenth century charters, the abbey acquired the toll as late as 1209.¹⁸ If the abbey had some connection to the salt trade earlier, this must have been linked to its properties in the Transtisza Region (Tiszántúl) and in Csongrád (the ford of Bőd).¹⁹

The third eleventh-century donation is connected to the Abbey of Bakonybél (also Benedictine) which – allegedly – in 1086 or in 1092 received a number of salt-transporting boats on the River Maros from King St Ladislav. However, this charter was later complemented (in the first half of the twelfth century), and the paragraph in question belongs to this later addition.²⁰ The salt-transporting servants and boats were again clearly referred to in the 1130s when the property of the Abbey, after having been occupied by a certain Opus (*comes udvarnicorum* of the king), was restored.²¹ Comes Opus did not act as a private person but as a royal official: he was probably required to control the royal incomes and to decide whether some part of them was illegally entering foreign hands. Taking this into consideration, we may suppose that in the first decades of the twelfth century it was not common for abbeys to take part in the salt trade and receive income from this activity.

Thus, we have three charters from the first century of the Hungarian Kingdom that mention different types of salt donations to three different Benedictine abbeys in western Hungary, but unfortunately all of them are either completely forged, or interpolated. Nevertheless, the privilege of Bakonybél Abbey did exist before 1131, as supported by the charter of King Béla II. In this case, the relevant question is: who gave the salt boats to the Abbey? The description of the donation is detailed, similar to the donation given by King Béla II to the collegiate chapter of Dömös, which would support its authenticity. In any case,

17 1075: Györffy (ed.) 1992, 206–218.

18 Weisz 2013b, 55–56.

19 Györffy 1963–1998, I, 892 and 899–900.

20 1086: Györffy (ed.) 1992, 247–249, 255.

21 1131: Erdélyi and Sörös (eds.) 1902–1916, VIII, 247.

the privileges of Bakonybél and of Dömös suggest that a new situation arose around 1100.

The first charter we have from the twelfth century is also problematic. According to this text, dated to 1137, but compiled in the first half of the thirteenth century, the abbey of Pannonhalma received two boats and the privilege to carry salt toll free to the abbey.²² Nonetheless, these details do not contradict those of other, authentic charters.

In fact, the first really reliable charter certainly relates to the donation of King Béla II from 1138.²³ The privileged Dömös Chapter was founded by the king's father, Prince Álmos, thirty years earlier.²⁴ The description of salt transport is very accurate: the two boats from Dömös were permitted to go and return six times a year on the River Maros, and to transport 24,000 pieces of salt from Transylvania (we later define what weight this quantity refers to) to a place called *forum Sumbuth* (Sâmbăteni). The name of this settlement, situated on the right bank of the river, does not appear again in any of the documents connected to the salt trade, but it is located just opposite the Abbey of Bizere which played an eminent role in the salt trade in the second half of the twelfth, and the first decades of the thirteenth century.

The next charters are different; in 1148, King Géza II gave the Chapter of Óbuda the toll from boats carrying wine and salt on the Danube, among other things.²⁵ In 1157, the archbishop of Esztergom received the salt tolls of two villages north of the city of Nána and Šturovo.²⁶ Similarly, the Abbey of Meseş²⁷ received a toll-like income in 1165 from King Stephen III: one block of salt went to the abbey from each salt-carrying cart that crossed the Meseş Pass.²⁸ Despite their differences, there is something similar about these two charters: the churches received only income, without participating in the salt business directly – just as in the case of the Hronský Beňadik Abbey.

An undated charter of King Stephen III contains particularly important information. According to this document, King Ladislas gave the toll of Sălacea to the abbey of Sîniob, but King Coloman cancelled this donation and burnt

22 MNL OL DF 206 811.

23 1138: Fejér (ed.) 1829–1844, II, 104.

24 For problems with the early history of the chapter, see Thoroczkay 2012.

25 Weisz 2013b, 307.

26 Weisz 2013b, 212–213 and 275.

27 The Abbey was built on the territory of the antique Porolissum. Its ruins can be found in the confines of the village of Mirşid.

28 1165: MNL OL DL 76 136 – Nagy, Nagy and Végely (eds.) 1871–1931, I, 2.

the donation charter. However, King Géza II later restored the rights of the monastery.²⁹ Thus, the first king to award such privileges was St Ladislav before the end of his reign, but Coloman did not support the measures taken by his predecessor.

From the 1180s on, the charters not only multiplied but their content also changed. The first document in the series is the privilege given to the bishopric of Nitra in 1183. According to this text, the bishopric received three boats with the same rights as were granted earlier to the Abbey of Bizere and the collegiate chapter of Arad.³⁰ Beside the fact that the formulation refers to the earlier privileges of two other ecclesiastical institutions, the charters of which did not survive, it also gives the bishop the permission to have more boats and thus to transport the specified amount of salt in a single shipment instead of in three portions. This infers that – unlike in later periods – there was one type of boat used for this purpose. It is also worth mentioning that the town of Szeged occurs for the first time in this privilege, as an alternative harbor for unloading the boats.

In 1192, less than ten years later, the Abbey of Pannonhalma received the privilege of having three boats on the Maros and transporting salt to the abbey itself.³¹ This time it is not documented how many times the boats would go and return. The privilege was repeated by King Andrew II in 1211, with the same formulation as the privilege of Nitra in 1183.³² A number of further privileges granted by King Béla III and/or King Emeric are referred to by King Andrew II (see below) but the original charters did not survive.

In the thirteenth century, more churches received different salt privileges. Such donations were given before 1204 to the collegiate chapter of Óbuda,³³ before 1196 to the Cistercian Abbey of Heiligenkreuz in Lower Austria,³⁴ in 1217

29 Weisz 2013b, 348.

30 1183: Wenzel (ed.) 1860–1874, XI, 48.

31 1192: Wenzel (ed.) 1860–1874, VI, 183. The privilege was repeated in 1211 (Wenzel [ed.] 1860–1874, VI, 348–349).

32 1211: Wenzel (ed.) 1860–1874, VI, 349.

33 1212: Fejér (ed.) 1829–1844, III/1, 123. By this charter King Andrew II restored the possessions of the Buda Collegiate Chapter awarded by his brother King Emeric before 1204, among them the salary.

34 1208: Weis (ed.) 1856, I, 39. The same privilege was repeated in 1217: Weis (ed.) 1856, I, 54. Confirmed in 1233 through the price regulations in the Bereg treaty in Wenzel (ed.) 1860–1874, I, 184 (1233).

to the Chapter of Zagreb,³⁵ in 1222 to the Teutonic Order,³⁶ and in 1225 to the Cistercian Abbey of Klostermarienberg.³⁷ In the same period (1217) another Benedictine Abbey (Szigetmonostor) received an income – namely 60 marks – from the salt sold in Bratislava, in compensation for half of the Pest toll taken by the King.³⁸ In 1232 we learn that the Abbey of Bakonybél received, some time after 1217, 30 marks of silver from King Andrew II, and the sum had to be paid from the income derived from salt by the officials of the King at Sălacea at Pentecost.³⁹ Last but not least, there is the Oath of Bereg itself, issued in August 1233 and including 29 institutions by name, and an unknown number of other churches which are generally addressed. This charter attempted to summarize the whole system of royal salt privileges that had begun to develop from the first half of the twelfth century. In fact, a whole series of charters connected to the Bereg oath were issued on 1st October 1233. Among the privileged institutions we find the abbeys of Pannonhalma, Tihany, Pornó, Szentgotthárd and Heiligenkreuz, and there is even a false charter for the Cistercian Abbey of Klostermarienberg dated to that day.⁴⁰

Thus, we have two types of privileges describing how different ecclesiastical institutions participated in the marketing of salt. The first group – including Hronský Beňadik, Esztergom, Meseş and Szigetmonostor, but also Zagreb and the second privilege of Bakonybél and Pilis – enjoyed incomes through the tolls or received a certain sum of money or (eventually) salt from the chambers of Sălacea or Szeged. If the donation was given in salt, the privileged institutions could sell it, as in the case of the Zagreb Chapter. The other group – including all the institutions mentioned by name in the Oath of Bereg, as well as the Teutonic Order before 1225, Bakonybél, Heiligenkreuz, Óbuda, Klostermarienberg and Tihany – had either boats for salt transport and barns

35 1217: Wenzel (ed.) 1860–1874, XI, 148–149. In fact, the salary Heiligenkreuz received from the Hungarian king is dated to before the earliest similar donation given by an Austrian archduke (1219). Cf. Weis (ed.) 1856, I, 55.

36 1222: Zimmermann et al. (eds.) 1892–1991, I, 19. The authenticity of the charter is discussed in: Györffy (ed.) 1992, 248–250.

37 1225: Wenzel (ed.) 1860–1874, I, 428.

38 1217: MNL OL DL 83 – Wenzel (ed.) 1860–1874, XI, 150. The text refers to the earlier donation of King Emeric. According to a later note on the rear of the charter, 40 marks should be given to the nuns of Margaret Island (the monastery was founded in 1252 by King Béla IV).

39 1232: MNL OL DF 292 176 – Wenzel (ed.) 1860–1874, I, 292.

40 According to the false charter of 1233 attributed to King Andrew II, the Abbey of Klostermarienberg would receive 1000 *zuans* of salt from the Sopron salt depot. See Weis (ed.) 1856, I, 295.

for storage or only barns where they could keep the salt under the seal of royal officials (*salinarii*) and the local prelate until the dates given in the charters (27th August and 6th December). From our perspective, it is this latter group that should be investigated more closely.

To understand what the charters refer to, some details must be ascertained. First of all, the privileges reflect a coherent system as far as the measures are concerned. Even if there were some discrepancies in the outcomes of the measures, theoretically the terms were fixed, and there is no reason to think that any confusion would have been tolerated by the king or the royal officials. As a consequence, we should regard the Oath of Bereg and the charters connected to it as a shared system of contracts that applied to more than thirty ecclesiastical institutions, with fixed measures and fixed, coherent prices. Accordingly, even if there is still some hesitation among historians about whether the amounts of salt that are described can be identified and converted into modern units of measure, I would argue that the source can be unequivocally interpreted, with the restriction that the conversion of the quantities that are described into modern measures has its problems.

First of all, one should understand the character of the charters. Usually, such treaties were regarded as simple charters of donation according to which different churches were given a certain amount of salt that they were allowed to transport toll free across the country to their storage barns, and to sell without restriction. However, looking more closely at the text (see the Appendix) we must reject this simplifying assumption. The respective treaty is much more a freight and store concession, and the right of free sale is restricted to the case that the king did not pay on time. We can imagine that such situations could occur – King Andrew II often had financial problems – but the original conception was certainly that the churches should receive their money on the fixed dates. Thus, the sums listed in the text are not prices for salt, but refer to compensation for shipping and storage costs. This also means that we do not know the actual value of the salt – which was certainly higher than the sums paid to the churches – but we do know its quantity. Although we do not know how much salt was transported on the Maros, nor the percentage of total production it represented, we have at least a figure for the minimum amount of salt that was cut in the mines.⁴¹

41 We should also take into consideration that production was determined by several factors. On the one hand, it was certainly limited by technical conditions (production and transport). On the other, one must not forget the demands of the market. Although it was possible to store salt for years if necessary, the main purpose of production was create income from sales. Thus, there was no reason to increase production if there was no

The charters issued in 1233 after the Bereg treaty, most of them on October 1st, should be analyzed in more detail. At first glance, the privileges of the abbeys of Pannonhalma,⁴² Tihany,⁴³ Pornó,⁴⁴ Szentgotthárd,⁴⁵ Heiligenkreuz⁴⁶ and Pilis⁴⁷ appear to have been issued simply because these institutions were not mentioned by name in the charter of Bereg. But then why do we find among them the abbeys of Pilis, Pornó and Szentgotthárd that are also listed in the Bereg oath? In order to supply the answer to this question, we must analyze the measures and the exact meaning of the units provided in the text.

The Measures

When speaking about the measures used in the Middle Ages, we face a number of problems. Since no unified system of measurement existed until the Modern period, the same units may refer to very different quantities. Furthermore, the exact meaning of the related words changed from time to time, and from region to region. However, even if the metric equivalent cannot always be precisely identified, the relationship between the different units can be established. For

need for the product on the market. To get an idea of the quantity of salt we are dealing with, we may examine the salt production of the Transylvanian mines in 1530s. In the early modern period, the five salt chambers produced more than 1.6 million pieces of salt (*sales curruales*) per year. This quantity was equivalent to more than 400,000 zuan, just four times the quantity recorded in the Bereg charter. According to written evidence, the production of the mines increased from the fourteenth century onwards. Cf. Draskóczy 2004d and Draskóczy 2014.

42 1233: MNL OL DL 206 929 – Wenzel (ed.) 1860–1874, VI, 520–521. The confirmation of the privilege given by King Béla III (1233): Wenzel (ed.) 1860–1874, XI, 258–259.

43 1233: Pannonhalmi Bencés Főapátság Levéltára (Archive of the Benedictine Archabbey of Pannonhalma), Tihany 1233 – Erdélyi and Sörös (eds.) 1903, x, 519. The text clearly states that the salt comes from the salt chamber in Sálacea.

44 1233: MNL OL DL 99 838 – Wenzel (ed.) 1860–1874, VI, 517–518. *Ecclesie vestre contulerimus mille zuanos*, in *Woswar a salinariis annuatim circa festum Sancti Joannis Baptiste* (24th June) in *prima via sine omni contradiccione, diminucione et dilacione persolueudos jure perpetuo*.

45 1233: MOL DL 99 839 – Szentpétery and Borsa (eds.) 1923–1987, 1/1, 161–162. The Abbey is mentioned in the Oath of Bereg too, but in this charter its rights and incomes are described in more detail. The problem is discussed later in the text.

46 1233: Wenzel (ed.) 1860–1874, I, 184 and 302.

47 1236: Theiner (ed.) 1859, 143. Pope Gregory IX refers to the earlier donation of King Andrew II.

information on the measures used in medieval and early modern Hungary, the work of István Bogdán is commonly referred to.⁴⁸ According to this author:

- 1 *sal navalis* = 5.5 or 10 Viennese pounds = 3.06 or 5.56 kilograms;
- 1 *lapis* (*kósó*, stone of salt) = 37.80 kilograms;
- 1 *sal currualis* = 17 Viennese pounds = 9.52 kilograms;
- 1 *tyminum* (*tömény*) = 10,000 pieces of salt (no weight specified);
- 1 *tulkó* = a large plate of salt the size of which is not typically quantified; term only used in mines.

In the sources of the Árpáadian age we find two further expressions. One of them is *zuan*,⁴⁹ which can be identified with the *kósó* in Bogdán's list. The *zuan* as a unit of measure need not have referred to one single piece of salt, although there is a source suggesting that there such large pieces existed.⁵⁰ Another measure appears to be a 'boat' (*navis*). It appears that as early as the beginning of the twelfth century, this unit did not simply refer to the vehicle used for transport, but also to a boatload as a measure. Since – unlike in the Modern period – the charters do not speak about different sizes of boats (e.g. the bishop of Nitra was allowed to have 'more boats', not bigger ones) we may assume that a standard-size boat was used on the Maros in the twelfth and the first half of the thirteenth century for salt transport. Fortunately, we have some idea what sort of vehicle this may be, since the imprint of a log boat was recently found during the excavation of Bizere Abbey.⁵¹ This boat was approximately 12 meters long and 1.5 meters wide, and made of oak. Similar types have been found in the River Dráva and near the River Szamos.⁵² The maximum loading weight of such a boat would have been approximately 6.3 tons.

Based on this information and the written evidence, the system of measurements can be reconstructed. The starting point is the "salaries" of the Dömös Chapter and the Cistercian Abbey of Szentgotthárd. Dömös received in 13824,000 blocks in six shipments of two boats. Thus, a log boat could carry 2000

48 Bogdán's works are available online: https://library.hungaricana.hu/hu/view/MolDigiLib_MOLkiadv4_07/?pg=0&layout=s (last accessed: 4 November 2016).

49 The origin of the word is quite obscure, its etymology unclear. Traditionally, linguists suppose that it is a Slavic loanword. However, it occurs in charters only between 1225 and 1233, which arouses suspicion.

50 1208: Weis (ed.) 1856, I, 39. *Preterea eidem cenobio tria milia salium qui regales dicuntur*. In 1217 the formulation of the same privilege is different: *donationem de tribus milibus zuanorum* (Weis [ed.] 1856, I, 54).

51 Rusu and Toda 2014.

52 Tóth 2010 and Tóth 2009.

blocks. This implies that a block weighed around 3.15 kilograms, corresponding to the weight of the late medieval *sal navalis*, specified as *sal aquaticus* in the charter of 1233. The weight of the *zuan* probably did not change – it was around 38 kilograms (37.8 kilograms, according to István Bogdán) at that time. On the basis of this knowledge, 1 *zuan* was equivalent to 12 pieces of *sal aquaticus*.

A larger unit of salt was also carried on boats, called *sal aquaticus maior*. This type appears in connection with the Chapter of Arad, the Cistercian Abbey of Igrış and the Knights Hospitaller. Based on the quantity given to the Chapter of Arad, 1 *zuan* equalled four pieces of *sal aquaticus maior* (i.e., around 9.45 kilograms, or three times the weight of *sal aquaticus*).

The price of *sal aquaticus maior* is given twice in the charter, and is slightly higher for the Cistercian Abbey of Igrış than for the Chapter of Arad (26 and 25 marks, respectively). The salary of the Knights Hospitaller is calculated on a completely different basis. In the first two cases, the reason for the variability may be the different transport distance (Igrış is more than 50 kilometers further from the Transylvanian harbors than Arad), or be connected to a task undertaken by Igrış Abbey,⁵³ but we do not know why the figure was different in the case of the Knights Hospitaller.

After these three items, the unit of measure changes in the charter. All the following amounts are given in *zuan*, although this unit is not always mentioned explicitly, while the salt was actually shipped in blocks of the normal size (*sal aquaticus*).

In the list of the privileged institutions, we find only these two types, but there is a further expression used in connection with land transport: *sal terrestris*. It is not by chance that this does not appear on the detailed list. The text speaks in general about shipping costs, not the price of salt itself, and this is not different in the case of *sal terrestris* (*Pro salibus vero terrestribus dabimus unam marcam pro centum zuanis, si sales suos debeant habere in confiniis, excepto monasterio S. Gothardi, cui pro octoginta zuanis dabimus unam marcam*). The sum mentioned is marginally higher than in the case of normal

53 Although neither this document nor other written evidence hints that the Abbey of Igrış undertook any additional tasks. However, further investigation is required: opposite Igrış is the village of Şeitin, the name of which refers to salt. North of it a canal system has been identified, leading towards the medieval settlement of Pereg (today, Kaszaper) which, based on C14 data, can be dated to the twelfth–thirteenth centuries. Thus, it is possible that these canals played a role in the shipping of salt, and that Igrış – the closest monastery to this transport route – may have controlled or maintained them. Since the archaeological investigation of the territory has only just started, this is a preliminary hypothesis. I am grateful to my colleague Zoltán Rózsa (Szántó Kovács Museum, Orosháza) for sharing his early findings with me.

river transport, and equals exactly the price specified in the Arad Chapter. The charter of King Andrew II issued on 1st October, 1233 tells us how the abbey received the salt. The king refers to a donation by his father, King Béla III, who gave the Cistercians of Szentgotthárd 20,000 pieces of salt (*viginti milia salium magnorum qui in curribus ad confinia Teutonie deferuntur*).⁵⁴ It is important that the charter repeats only the price and the method of calculation from the Bereg Oath while the amount of salt is stated in a different way – not in *zuan*, but in pieces of *sal magnus*. This means that the Abbey of Szentgotthárd stored salt from two different sources: 2500 *zuan*'s worth of that which was carried on the Maros, and 20,000 pieces of *sal magnus* that arrived from another direction, carried on the land road to Sălăcea, and then to other places around the country. Thus, *sal magnus* is determined to be equivalent to *sal aquaticus maior*, the later *sal currualis*. The system of measures was thus as follows:

$$1 \text{ zuan (sal regalis)} = 4 \text{ sal magnus} = 4 \text{ sal terrestris} = 4 \text{ sal aquaticus maior} = 12 \text{ sal aquaticus}$$

Although Szentgotthárd can be identified as one of the largest salt depots, storing 7500 *zuan* (283,500 kilograms) a year, the same amount was administered by the Abbey of Igriş. The whole quantity generated 86.5 marks of income per year, the major share of which, without doubt, went to cover shipping costs.

This case informs us that the Oath of Bereg mainly concerns salt transport on the Maros River, but also that there was another, probably even older route for exporting salt from Transylvania – through the Meseş Pass to Sălăcea – and that other churches participated in this business too. Therefore, the expressions *sal aquaticus* and *sal terrestris* are not equivalent to the later denominations *sal navalis* and *sal currualis*, although the sizes did not change – at least there is no sign of this. *Sal terrestris* specifically referred to the salt carried on land from northern Transylvania, while *sal aquaticus* meant the salt shipped down the Maros River. One question is whether the two routes always remained unconnected.

Although the Legend of St Gerhard speaks about the conflict between King St Stephen and Ajtony over salt transport on the river, there is no direct evidence for the existence of this route before the twelfth century. In fact, it is not only the lack of written evidence, but the lack of institutional background that should be noted. Hardly any central settlements existed in the region before 1100. The town of Cenad, which was the seat of the bishopric, was certainly one

54 1233: MNL OL DL 99 839 – Szentpétery 1923, 1/1, 161–162. The false charter of the Klostermarienbergr Abbey followed this formulation (cf. fn. 41).

of them, but the early existence of Arad and Szeged is doubtful. In Arad, the collegiate chapter was founded in the first half of the twelfth century, probably by King Béla II, and the earliest church of Szeged was also built in the twelfth century – at least according to the archaeological evidence. The chain of monasteries, whose participation in salt transport is documented from the second half of the twelfth century, also emerged – according to the archaeological data – after 1100. Another hint is that the Oath of Bereg contains detailed regulation about river transport, while land transport appears only in the context of price regulation, suggesting that land transport was older, and the system was well known and established. The relative novelty of river transport is supported by a false charter, too, according to which Pannonhalma Abbey received three boats on the Maros in 1137. In fact, the document was written around 1228, but it is probably not by chance that the falsifier dated it to the 1130s – in this respect, he was more skilled than the scribe of the Pécsvárad Abbey who dated his false charter to the beginning of the eleventh century.

Coming back to the issue concerning the charters issued in 1233 after the Oath of Bereg, it appears that several monasteries were not, or not only, involved in the salt business along the Maros. The Cistercian Abbey of Szentgotthárd had privileges for both directions, while the Abbey of Tihany seems to have been involved only in trade via the land route.

The total quantity distributed in the charter of Bereg was 89,000 *zuan* (approximately 3364 tons). After adding the quantities known from other charters, the amount totals 105,700 *zuan* (nearly 4000 tons). Supposing that the quantity carried on the two shipping routes was more or less equal, total production was at least 190,000 *zuan* (approx. 7200 tons). To put the importance of the Transylvanian salt industry into perspective, the yearly production of Lüneburg, the major center of the Nordic salt industry, was estimated at around 1200 to 5200 tons.⁵⁵

As far as the value of the salt is concerned, it is difficult to calculate. Based on the toll regulation of Buda issued by King Béla IV in 1255, the value of one piece of salt (*sal terrestris/magnus*) was 10 denars, and 10 *zuan* of salt was worth 1 mark. This information suggests that the value of salt recorded in the Bereg treaty was 8900 marks. The sum promised to churches for shipping and storage was around 10 % of this value (884.6 / 932.6 marks). Furthermore, the cost of production should be clarified. In the second half of the thirteenth century, production costs amounted to 1/30th of the value of the salt,⁵⁶ but

55 Withöft 1976, 104–106. Production in Lüneburg increased to 15,000 tons by the end of the thirteenth century.

56 Knauz et al. (eds.) 1874–1999, I, 478.

before the Mongol Invasion, when miners were servants of the king, the cost was probably less. In the 1230s, the estimated value of the total quantity of salt exploited per year was at least 18,900 marks. After deducting an average of 12 % for costs, the remaining income was nearly 16,700 marks (with some part of the salt remaining in Transylvania, it probably exceeded 17,000 marks). This estimation is slightly higher than the 16,000 marks listed on the income register of King Béla III.

It is also worth examining the proportions of different orders, and other church institutions. The bishops and the collegiate chapters received around 40 % of the total quantity, the Benedictines and the Cistercians around 25 % each (the Benedictines had a slightly larger share), and the remaining 10 % was shipped and stored by the Knights Hospitaller. The income register of King Béla III⁵⁷ suggests that shipping and storage costs were at least 7 % of the income derived from the salt (the part we know of). Addition of the total amount of other known salaries, and the estimated value of the salt received by Meseş Abbey (at least 500 *zuan*), we find the total value of the silver promised to the churches to be at least 1355 marks – a large sum, but scarcely more than the 0.5 % of royal income in King Béla III's time.

While the treaty of Bereg was very advantageous for the church, it was extremely disadvantageous for the king. On the one hand, the different ecclesiastical institutions obtained the right to carry the salt from mines to depots, and to store it until a predefined date. They also received a fix sum in good silver for this purpose from the king – later paid in foreign currency –, and in addition, they obtained the right to use an unlimited portion of the salt for their own purposes and to sell the salt freely if the king was late in paying. On the other hand, the king had to pay out a considerable sum of cash each year, he never knew how much salt had been used by the churches, and he risked losing all of it if he was unable to provide the privileged institutions with the money they were due. However, it should be emphasized that the ecclesiastical institutions did not receive the mines nor the salt as a property gift. The Bereg Oath described a concession to freight the salt from Transylvania to the official depots where it was stored under the seal of the royal official (*salinarius*) and the local prelate. Money was not paid for the salt itself, but to cover the expenses of the churches.

57 Barta and Barta 1993, 443–444.

Conclusions

In summary: what can be said about the Árpáadian-age salt trade, and the charter of 1233 in particular? First of all, it must be emphasized that the legal framework of the salt trade appears to be fairly different from what we know from the late fourteenth century. From early times until approximately the end of the eleventh century, the production of Transylvanian salt mines was mainly transported via the northern land route using caravans and carts. In this early phase, the mines were already the property of the king, and the trade in salt belonged to his domanial income (in legal terms, it was not yet *droit de régle* in that period).⁵⁸ River transport began to develop by the turn of the eleventh and twelfth centuries. Church institutions, especially monasteries, were involved in salt transport rather early on; the first detailed description of the business model that we know of is the privilege of the Dömös Chapter. The breakthrough happened in the last third of the twelfth century when the number of privileged institutions multiplied: many charters issued by King Andrew II mention that the donation he confirmed was originally awarded by his father and/or brother. There are some traces of an effort to reorganize the salt trade around 1217: it is around this year (and also a few years later) that donations are confirmed, suggesting their earlier existence. The Oath of Bereg was designed to be the final treaty between the king and the church concerning the rights of the ecclesiastical institutions regarding the salt trade, involving most bishops with collegiate chapters, Benedictine and Cistercian abbeys, and the Knights Hospitaller. However, the Oath did not survive the death of King Andrew II. Instead of reconfirming Andrew's regulation (there are no transcriptions of the charter after 1234) his son and successor King Béla IV withdrew the concessions shortly after his accession to the throne, although he continued to support the monasteries from the income from salt.⁵⁹

We have also learned that the units of measure were the same in this period as in the Late Middle Ages, but the denominations were different. They probably changed because of the opening of the Szamos route in the late thirteenth and early fourteenth century. From that time on, there was no reason to differentiate between *sal terrestis* and *sal aquaticus* in reference to two different freight routes.

58 About the issue in a broader context, see Paulinyi 1924.

59 Without further enumerating these charters, we refer to his donation to the Cistercian Abbey of Petrovaradin – which he founded – according to which the Abbey was paid the value of 50000 pieces of salt in Szeged. The infirming of the earlier privileges is also reflected in the series of false charters produced by the Cistercian Abbey of Klostermarienberg.

Ultimately, the process is part of the formation of the salt regale which – similarly to in other regions of Europe – probably appeared in the twelfth century, and went through considerable transformation before emerging in its late medieval form. The church played a significant role in this process by building up and managing the younger river route for about a century.

TABLE 7.1 *Salt donations to churches before 1233*

Name	Type of institution	Amount	
		in the charter	in <i>zuan</i>
Bakonybél	Abbey (B)	3 boats/4×	2000
Bakonybél	Abbey (B)	30 marks	
Dömös	Collegial	24000 in 2 boats/6×	2000
Heiligenkreuz	Abbey (C)	3000 <i>zuan</i>	3000
Klostermarienbergr	Abbey (C)	200 <i>zuan</i>	200
Nitra	Bishop	3 boats/3×	1500
Óbuda	Collegial	tyminii salium	2000*
Pannonhalma	Abbey (B)	3 boats/2×	1000
Pilis	Abbey (C)	100 marks	
Szentgotthárd	Abbey (C)	20000 sales magni in curru	5000
Szigetmonostor	Abbey (B)	60 marks	
Tihany	Abbey (B)	1000 <i>zuan</i>	1000
Zagreb	Chapter	50 marks	
Sum			16700

*Quantity received in 1233

TABLE 7.2 *Salt donations to churches in the 1233 Beregr charter*

Name	Type of institution	Amount in <i>zuan</i>
Alba Iulia	Bishop	2000
Arad	Collegial	500
Archbishopric of Esztergom	Bishop	2000
Archbishopric of Kalocsa	Bishop	10000
Bač	Chapter	10000

Name	Type of institution	Amount in <i>zuan</i>
Bishopric of Cenad	Bishop	5000
Bishopric of Oradea	Bishop	2000
Bizere	Abbey (B)	4000
Bulci	Abbey (B)	5000
Cârța	Abbey (C)	1000
Ercsi	Abbey (C)	1000
Gyelid	Collegial (?)	500
Hodosmonostor (Bodrogu Vechi)	Abbey (B)	1000
Igrış	Abbey (C)	7500
Izsó	Abbey (B)	1000
Kenéz	Abbey (B)	2000
Knights Hospitallers	Knights	10000
Óbuda ^a	Collegial	2000
Pilis	Abbey (C)	2000
Pornó	Abbey (C)	1000
Prešov	Abbey (B)	3000
Rohonca	Abbey (B)	4000
Székesfehérvár	Collegial	2000
Szekszárd	Abbey (B)	1000
Szentgotthárd	Abbey (C)	2500
Szer	Abbey (B)	1000
Szőreg (Szeged)	Abbey (B)	1000
Titel	Collegial	3000
Zirc	Abbey (C)	2000
Sum		89000

- a The collegiate chapter received a donation of salt before 1204 from King Emeric. The evidence for this is the charter of King Andrew II (see above) which does not specify the exact quantity, but speaks only about *tymínios salium*. The original charter probably contained a donation similar to that given to Dömös and Szentgotthárd, in which the amount was specified in *sales navales* and *sales curruales*, respectively. The 2000 *zuan* given in 1233 corresponds to 24000 *sales navales*.

TABLE 7.3 *Total amount per type of institution in the 1233 Bereg treaty*

Type	Zuan	%	Mark	%
Benedictines	23000	25.8	220.8	25.0
Cistercians	17000	19.1	169.2	19.1
Knights Hospitallers	10000	11.2	120.0	13.6
Bishops	31000	34.8	297.6	33.6
Collegiate chapters	8000	9.0	77.0	8.7
Sum	89000		884.6	

TABLE 7.4 *Total amounts per type of institution (to institutions not mentioned by name in the Bereg charter)*

Type	Zuan	%
Benedictines	27900	25.6
Cistercians	28200	25.8
Knights Hospitallers	10000	9.2
Bishops	32500	29.8
Collegiate chapters	10500	9.6
Sum	109100	

Appendix

Detail of the Oath of Bereg

20th August, 1233, in the Bereg Forest

Prímási Levéltár Esztergom (Esztergom Primate Archives) Lad. V nn. 2 & 3 (MNL OL DF 248 771).

Edition: Fejér (ed.) 1829–1844, III/2, 320–323.

Item volumus et concedimus, quod ecclesie libere portent sales suos ad ecclesias ipsas, et ibi sub sigillo salinariorum, et prelati illius ecclesie, in qua sales deponuntur, qui pro tempore fuerint, deponantur, depositique servantur usque ad octavas S. Stephani Regis (27th August), et tunc ab illo die usque ad nativitatem B. V. Marie (8th September) solvatur eis argentum pro salibus, quos tunc ecclesie habuerint penes se, secundum

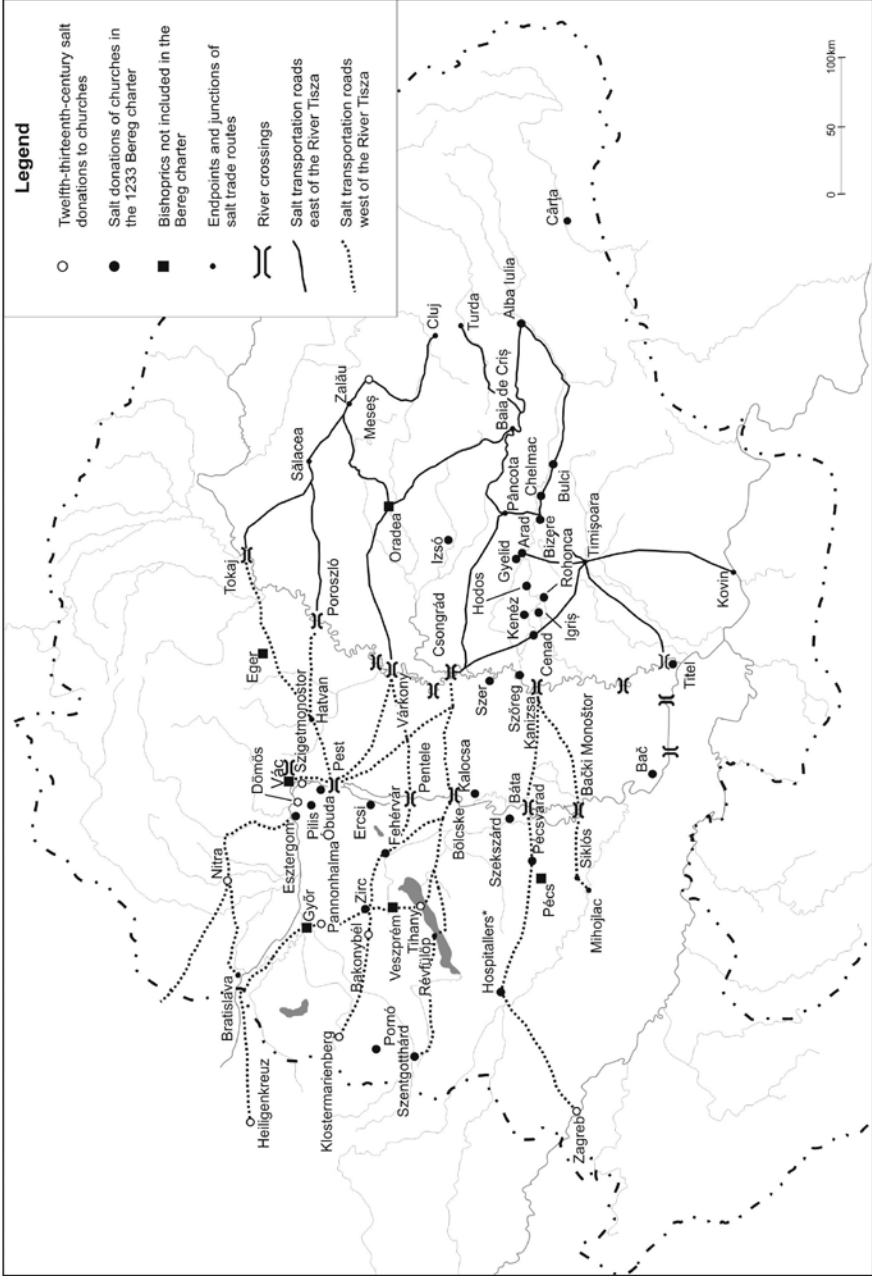


FIGURE 7.1 The organization of salt transportation before the Mongol invasion.

estimationem inferius adnotatam. Et si in illo tempore ipsi salinarii ipsos sales non emerent, et ecclesiis argentum, secundum dictam aestimationem, non solverent; ex tunc omni tempore sales illos in proprium usum ecclesiae percipientes, vendant iuxta sue arbitrium voluntatis, et omne lucrum, quod deberemus nos, vel alius rex, qui pro tempore fuerit, vel ipsi salinarii, inde percipere, totaliter cedat in usus ecclesiarum. Nec a salinariis ipsis, vel nobis, vel aliis personis, aliquatenus molestentur, quin possint, quidquid placet eis, facere semper de salibus, ex quo in dicto termino non fuerit eis pecunia persoluta. Item dicimus de secundo termino, ut a festo S. Nicolai (*6th December*) usque ad festum Beati Thome Apostoli (*21th December*) pro salibus, quos apud se habebunt ecclesie sub sigillo salinariorum, solvatur eis argentum secundum aestimationem adnotatam. Quod si factum non fuerit, idem fiat, quod in casu superiore de salibus dictum est.

Argentum vero, quod praedictis ecclesiis persolvetur, erit in bonis Frisaticis, vel in argento, cuius decima pars comburetur. Precia vero salium sunt haec:

quod pro quolibet timino salium aquaticorum, persolventur ecclesiis octo marce, excepta domo hospitalis Hierosolymitani, et ecclesiis Colocensi, et Bachiensis, quibus pro quolibet tymino dabimus decem marcas, si dictae ecclesie Colocensis et Baachiensis debeant deferre sales suos in Zegedyn, vel ultra, alioquin octo marcas habebunt. Pro maioribus vero salibus aquaticis, debemus abbacie de Egrus xxvi marcas pro quolibet timino, et ecclesie Orodienis xxv similiter pro quolibet timino. Pro salibus vero terrestribus dabimus unam marcam pro centum zuanis,⁶⁰ si sales suos debeant habere in confinibus, excepto monasterio S. Gothardi, cui pro octoginta zuanis dabimus unam marcam. Nos vero, et quicumque fuerit rex pro tempore, debemus mittere sales ad confinia, secundum tenorem privilegiorum ecclesiarum, et deponi debent in domibus privilegiatorum, ubi stabunt sub sigillis salinariorum usque ad predictos terminos. Et eodem modo omnia servantur a nobis et ab ipsis, sicut dictum est in terminis supra dictis.

60 The tradition of giving the price of the salt per 100 pieces was long lasting. In 1397, King Sigismund issued a regulation on the price of salt (MNL OL DL 8861) according to which 100 pieces could be sold for 3 florins in Buda. Cf. Wenzel 1880, 438. In 1511, in a contract between the exchequer Gabriel Perényi and Ambrosius Sárkány de Ákosháza, we learn the actual value of *sal currualis*: Four florins for 100 pieces – higher than the price of the salt fixed by King Sigismund in the early fifteenth century. The amount given by the exchequer is considerable: 25000 pieces of salt weighing altogether 236250 kilograms (more than 110 loads). Cf. Tringli (ed.) 2008, no. 761 (11 November 1511).

Ecclesiae vero retinebunt de salibus suis ad usus suos hoc modo:

abbacia de Egrus tres timinos;
praepositus Orodiensis cum capitulo suo duo millia lapidum;
Hospitale Hierosolymitanum cum omnibus domibus suis de Hungaria IV timi-
nos de talibus salibus, quales habet monasterium de Egrus;
monasterium S. Gotthardi duo millia et 500 zuanos;
ecclesia Varadiensis 2000;
ecclesia de Pernoch 1000 zuanos;
ecclesia de Zeer 1000 zuanos;
ecclesia Colocensis unum timinum;
ecclesia Bachiensis unum timinum;
ecclesia Albensis Transilvana 2000 zuanorum;
ecclesia de Bulch 5000;
ecclesia de Epuryes 3000;
ecclesia de Bistria 4000;
ecclesia de Zadust 1000;
ecclesia de Ysou 1000;
ecclesia de Roncha 4000;
ecclesia de Kenaz 2000;
ecclesia S. Philippi 1000;
ecclesia de Geleth 500;
ecclesia de Saxsvar 1000;
ecclesia Cenadiensis 5000;
ecclesia Titulensis 3000;
ecclesia de Chod 1000 zuanos;
ecclesia Strigoniensis 2000 zuanorum;
ecclesia Albensis totidem;
ecclesia Budensis 2000;
ecclesia de Bokan 2000 zuanorum;
ecclesia de Pelis totidem;
ecclesia de Kercz 1000 zuanos.

Aliae vero ecclesiae, quarum nomina non exprimuntur, recipient ad usum suum, secundum quod praelati earum in animas suas dixerint.

Item volumus et consentimus, quod sales in salisfodinis non vendantur carius, quam antiquitus vendi consueverint ecclesiis, quae consueverunt emere sales. Pro redditibus vero ecclesiarum, qui hactenus subtracti sunt in salibus, exceptis decimis, persolvemus 10000 marcarum per quinque annos continuos; qui anni incipiunt computari a proximo Pascha resurrectionis Dominicae; et solutionem faciemus hoc modo:

in primo anno in nativitate B. Virginis solvemus 1000 marcas; in festivitate S. Thome Apostoli 1000 marcas alias; et sic postea quolibet anno continue faciemus, quousque dictam pecuniam decem millia marcarum persolvamus, et totam istam pecuniam persolvemus in dictis terminis; episcopo Cenadiensi, abbati S. Martini de Pannonia, abbati Egriensi (*recte* Egrusiensi), vel eorum procuratoribus, habentibus a dominis suis procuratorias super hoc litteras speciales; vel duobus ex praedictis, vel procuratoribus eorum. Et solvemus eam in domo Fratrum Predicatorum de Pest in presentia Capituli, vel maioris partis, distribuendam et ordinandam secundum voluntatem dicti legati de consilio Strigoniensis, et Colocensis Archiepiscoporum. Et nihilo minus, si praedictam pecuniam decem millia marcarum non solverimus, in singulis terminis, sicut superius est expressum, volumus et consentimus, quod ecclesie, quibus sales sunt subtracti, non obstante ista compositione, libere et integre sint in eodem statu et iure, in quo erant ante compositionem istam.