

ACCOUNT BOOKS OF THE NEW MOSCOW ENGLISH MINT IN THE 17th CENTURY: ATTEMPT OF RECONSTRUCTION

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Abstract: Russian accounting practice before the era of Peter the Great's reforms is unfairly characterized by many scholars as primitive, and the accounting methods introduced in Russia by Emperor Peter are exclusively borrowed from Western Europe. However, archives contain documents that testify to the use of advanced methods of calculating the cost of finished products and procedures for internal control of inventories and cash at Russian state manufactories in the 16th-17th centuries. An example of the use of complex accounting techniques can be found in the income and expenditure books of the Moscow Printing House (1618-1700) that was not the only large state manufactory of that time. Unique documents of the New Moscow English Mint (1654-1663) have been preserved in the Russian State Archive of Ancient Documents. The authors of the article attempted to reconstruct the corpus of account books of the New Moscow English Mint using the comparative method and logical-analytical modeling and relying on the well-known and studied documents of the 17th century. The purpose of the study was to confirm the thesis about the existence of complex accounting techniques in Russia in the pre-Petrine era.

Keywords: *accounting history, 17th century, New Moscow English Mint, account books.*

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1 Introduction

In the 17th century, accounting had already become a special area of professional activity in many European countries, while in Russia it was only just beginning to be recognized as the most important function of the management system, both at the state level and for individual entities (Kuter & Sokolov, 2012). This is the reason why many scholars consider that Russian bookkeeping practice before the era of Peter the Great's reforms were primitive (Motyka, 1990; Platonova, 2009), and accounting methods introduced in Russia by Emperor Peter were exclusively borrowed from Western Europe. However, this is true in relation to double entry bookkeeping, but cannot in any way apply to the development of bookkeeping in general. Russian archives contain documents that testify to the use of advanced methods of calculating the cost of finished products and procedures for internal control of inventories and cash at state manufactories in the 16th-17th centuries.

An evidence of the use of complex accounting techniques can be found in the income and expenditure books of the Moscow Printing House (Sidorova & Nazarov, 2019). Another example of large state enterprises at that time were mints. Coins were produced in various Russian principalities until the 16th century. However, from the 17th century onward, this process was centralized and became the sovereign prerogative of the Russian monarch. The reason for this was that the 17th century became the time of the formation of the Russian state, which united the possessions of many principalities, and the creation of centralized tsarist power.

A set of financial documents of the Order of the Great Treasury Mint have been preserved in the Russian State Archive of Ancient Documents (Moscow, Russia). There are lists of account books of the New Moscow English Mint (1654-1663) among them, but are not account books themselves. The authors of the article attempted to reconstruct this corpus of account books. The purpose of the study was to confirm the thesis about the existence of original bookkeeping techniques in Russia in the pre-Petrine era.

2 Literature

By analyzing the scientific publications, we conclude that studies on 17th century accounting in Russia are hitherto neglected. Motyka (1990) investigated the influence of Western accounting practices on the development of accounting in Russia; however, the scholar concentrated on accounting in the merchant trade. Sokolov et al. (2018) analysed the bookkeeping and control of production and circulation of alcohol in Russia from the 16th to early 20th centuries. In 2025, Karelskaia and Zuga published the article on records on birch bark dating from the 11th to 14th centuries.

Papers published on Anglophone journals and monographs have devoted their

attention mainly on cost accounting in other countries in the same or similar periods. For example, these studies - addressed to UK (Boyns and Edwards, 2013; King, 2010), Canada (Spraaakman and Wilkie, 2000), France (Lemarchand, 1994; Nikitin, 2002), Spain (Carmona et al., 1997; Carmona and Gomez, 2002; Carmona and Donoso, 2004; Gutiérrez-Hidalgo et al., 2005), Italy (Sargiacomo, 2006; Zambon and Zan, 2007) or Portugal-Brazil (Carvalho et al., 2007; Sangster and Rodrigues, 2013) - may be mentioned.

To give an idea, Carmona and Donoso (2004) examine the role of cost systems in early regulated markets by focusing on the case of the soap production and distribution monopoly in the City of Seville, Spain. The authors analyse how producers of the soap manipulated to their own ends the use of newly purchased versus inventoried materials in the soap test and incorporated into the total cost what present-day terminology would call the opportunity cost of the buildings, investments in inventory and machinery, and various employee expenses not previously considered.

There are very few investigations of Russian accounting focused on the 17th century in Russian too. Sokolov (1985) provided previously unknown information about accounting practices in the manors, monasteries and industrial enterprises of the 17th century. Sokolov's works remain unrivaled in the breadth of their material and the thoroughness of their conclusions about the evolution of accounting but he focused mainly on the development of bookkeeping in later periods.

Ivanov's book (2005) discussed bookkeeping in monasteries of the 16th and the 17th centuries, where single entry bookkeeping was used. This work is based on the study of numerous archival materials and represents a detailed analysis of the organization of accounting and control in monasteries.

The history of accounting in the work of Medvedev and Nazarov (2007) was represented through documents regulating the economic life and accounting practices from 1246 to 1996: government decrees, orders, and instructions. Meanwhile, the practice of accounting in Russian government institutions in the pre-Petrine era is little studied and requires in-depth research.

Simultaneously there are a large number of works by Russian authors in related fields of study—metal production and coinage. In this area of research, fundamental works by Chistyakov (1844), Brickner (1864), Spassky (1962), Serbina (1971), Zverev (1998), Melnikova (2005), Winkler (2014), Temiraev (2015), and Yartsov (2018) have been published. There is also extensive literature devoted to the development of public administration in Russia in the 17th century—by Karamzin (1829), Gorchakov (1868), Solovyev (1879), Shimko (1894), Bogoyavlensky (1980), Novoselsky (1994) and others. These works served as the basis for a deeper understanding of the economic and social conditions in which accounting developed in Russian government institutions in the 17th century.

3 Methods and Sources

Research in the field of accounting history primarily involves the study and analysis of primary sources - accounting and financial documents of past time. However, often, due to various circumstances (wars, natural disasters, careless storage, etc.), many unique sources are lost, although their existence is known from written or printed evidence of the era. For example, unique *inventories* of financial documents from 1654 to 1663 (*RGADA, Fond 368, Inventory 1, Documents 1-6*) have been preserved in the archives, containing references to various documents of the New Moscow English Mint (NMEM), but these documents themselves have not yet been found by researchers. The authors of the article attempted to reconstruct the corpus of accounting documents using the comparative method and logical-analytical modeling based on previously known and studied documents of the 17th century (Zverev, 1998; Zaitsev & Melnikova, 2001; Melnikova, 2005; Winkler, 2014).

The New Moscow English Mint was not chosen as the object of the study by chance. Firstly, the inventories available to the scholars cover almost the entire period of the NMEM existence – from 1654 to 1663. Secondly, the NMEM produced a single product in large quantities: from 1655, only copper coins were minted there (Mayerberg, 1874; Zverev, 1998). In this case, the technological process is clear, the stages of production process are well known, which simplifies the task of reconstructing the accounting and control systems. Comparing the accounting practice of the NMEM with other known cases, it is possible to prove that original bookkeeping techniques were not an isolated phenomenon, but were inherent at many large Russian manufactory of the 17th century.

4 Evolution of Russian bookkeeping up to the 17th century

Russia's modern financial accounting and reporting system is based on long-standing traditions and the experience of numerous generations of accounting professionals beginning with the establishment of the earliest settlements in Ancient Rus' in the 9th-11th centuries AD. We agree with Littleton (1933), that continuity and consistency in the development of accounting technologies ensures the selection of the most original and useful ideas and best practices, which have been developed through trial and error.

In the early stages of accounting development in various regions of the world, accounting techniques were developed based on the raw materials most accessible to the specific locale (Nissen, Damerow & Englund, 1993). The inhabitants of Ancient Rus' formalized trade transactions and wrote business letters on birch bark (Malkova, 2012). Birch bark letters from the 11th century represent the earliest evidence of accounting records discovered in Central Russia (Karelskaia & Zuga, 2025). Document on birch bark is externally an elongated sheet of birch bark, usually cut off at the edges.

As a rule, documents on birch bark are single leaves, but sometimes one can find books made of birch bark – codices. In 2000, the Novgorod Codex (or the Novgorod Psalter) was found in Veliky Novgorod, consisting of 12 pages of religious content (Malkova, 2012), but this is an exception to the general rule of using birch bark for records in Russia in the 11th–15th centuries. Records on the documents were made by pressing or scratching on birch bark with the tip of a metal or bone tool (stylus) specially designed for this purpose (Karelskaia & Zuga, 2025).

Financial documents presented on birch bark attest to the complex monetary transactions of the inhabitants of Ancient Rus', including payments for goods, recording loans, tax liabilities and guarantees, etc. Even at that time, accounting documents were used as evidence in court, in dispute resolution, and in sentencing. At present, birch bark documents are kept in the State Historical Museum, Novgorod State United Museum Reserve, Pskov State Museum Reserve, Smolensk Museum Reserve, etc. that is determined by places of their findings.

Currently, descriptions of birch bark letters can be found in two electronic databases. One of them is the electronic database '*Old Russian documents on birch bark*'. It was created in the early 2000s as part of the scholarly project '*Birchbark Literacy from Medieval Rus: Contents and Contexts*,' which was funded by the International Association for the Promotion of Cooperation with Scholars from the Newly Independent States of the Former Soviet Union (Karelskaia & Zuga, 2025). This database contains an archive of more than a thousand of high-precision digital images of birch bark documents and their archeological and linguistic descriptions (*Old Russian documents on birch bark*). Another discription was developed by Amelia Gardner-Thorpe, a member of a team working at the Center for History and Economics at Harvard University and Cambridge University. This project concerns 762 birchbark letters from several cities in Kyivan Rus' dating between c.1100 and 1300 (*Birchbark Letters in Kyivan Rus'*).

The advent of paper made it significantly easier to prepare, transmit, and store financial documents, giving accounting technologies a new impetus. Before 16th century, monasteries, individual feudal estates, and government agencies (treasuries and departments) kept account books in Russia by hand. Printing appeared in Rus' only in the second half of the 16th century. Existing literature (Hellie, 1999; Pochinskaya, 2012) recognizes Ivan Fyodorov and Peter Mstislavets as the pioneers in Russia. The first books printed in their printing house date back to 1553-1564.

In the 17th century, accounting in most European countries had passed through the stage of professionalization; there is documentary evidence of government regulation of accounting procedures; the number of publications summarizing the practice of using the double-entry system had increased (Sokolov, 1985; Kuter & Sokolov, 2012). In Russia at that time, not only was accounting practice not regulated by the state, but even the introduction of the double-entry system and the establishment of the accounting profession had not yet occurred (Sokolov, 1985; Ivanov, 2005).

Accounting transactions were registered by means of traditional methods (as books of receipts and books of charges, in textual form, with letters used to designate figures); there were no specialized publications on accounting.

The accounting registers used at that time were income and expense books, which reflected the movement of money and material assets (raw materials for production, the most valuable stocks, construction materials, finished goods, and other inventories). In historical literature, such books were called "*economic ledgers*" (Sokolov, 1985). Entries in them were typically made by those responsible for economic activity: cellar monks, estate and enterprise managers, merchants, clerks, and sub-clerks. However, these persons had no specialized accounting training, and their responsibilities were significantly broader than simply maintaining accounting records.

The precursors of book-based accounting were "*memoranda*" written on separate sheets of paper, representing a separate record of each economic event. Gradually, responsible persons appreciated the convenience of combining and accumulating multiple records in a single book bound together from multiple sheets. Researchers found collection books, combining various documents and types of records (inventories, attribution lists, signatures, receipts, and expenditure records) among the earliest archival finds stored in Russian archives (Ivanov, 2005:36). They testify to our ancestors' intention to create a single, universal accounting register designed to collect and store all information on the economic activity of an economic entity.

Historians date the widespread use of income and expenditure account books in monasteries to the mid-16th century. Thus, Ivanov (2005) notes the influence of the 1551 decree of the Stoglav Council on the mandatory accounting of monastic property and state control over its use. In his work, Ivanov summarized the results of an analysis of the formats and contents of well-preserved income and expenditure account books from 3 monasteries in northern Russia, differing in size, history, and scale of economic activity: Solovetsky, Nikolo-Korelsky, and Krestny Onega. The author proposed a classification of monastic income and expenditure books based on the monasteries' activities, dividing all ledgers into 3 groups: administrative and managerial, trade and distribution, economic and industrial.

Each income and expenditure book contained a consistent set of elements: a cover heading; an introductory entry, including information about the appointment of the monk responsible for maintaining the records and their duties; the main section; a certification section with the compiler's signature; and a record of the book's verification. The contents of the account included the date, an indication of the transaction (purchased, sold, or withdrawn), the names of the parties to the transaction, the quantity and price of the goods, and the total (Ivanov, 2005:37).

An analysis of archival documents from the 16th and 17th centuries suggests that, given the development of socioeconomic relations, the expansion of the commodity market, and the emergence of large enterprises with complex administrative systems, the creation of a single, universal accounting register for collection an information about

all types of economic activities proved impossible. Gradually, a trend emerged toward specialization of account books and the search for their most suitable format for different economic activities.

Unified, consistent accounting system was not established in the monasteries. No instructions or documents from higher-level church authorities regulating the composition, quantity, or structure of records in accounting registers have been found in the archives. Each monastery compiled its own set of books based on its internal needs, taking into account the composition and specific nature of its activities.

The primary function of income and expenditure books was control. Ivanov (2005:42-45) made an important observation in his analysis of the contents of monastic income and expenditure ledgers: the word "account" is used in their sense of control and audit. The "account" of a book was performed by the abbot, cellarer, or cathedral elders after its completion or periodically (annually), and entailed verification, summing up of totals, reconciliation of income and expenditure with the balances of the treasury and food, and the compilation of "account lists." After confirming the accuracy of the entries, the books were placed in chests and sealed for safekeeping. If shortages or falsifications were discovered, an investigation was conducted, and the culprit was asked to provide an explanation. Thus, the control function of Russian bookkeeping was implemented as an integral part of its earliest stages of development.

5 Bookkeeping at Russian state manufactories in the 17th century

Many scholars have suggested that the bookkeeping practice in Russian monasteries served as a prototype for the accounting systems at large state manufactories in the 17th century (Sokolov, 1985; Ivanov, 2005). For these enterprises, it was also important to record the movement of material and monetary resources, computation of income and expenses, and control over the safety of inventories. Such accounting records were organized as descriptive textual entries in paragraph format, with Old Slavonic symbols used to designate numerical information (Figure 1).

Many examples of such records are account books of the Moscow Print Yard (RGADA:1182:1:15; 1182:1:37), of the Moscow Velvet Factory (1684) (RGADA:194:1:1-4), and the Sovereign's Arms Treasury (1687) (RGADA:396:2:936) which are kept in the Russian State Archive of Ancient Documents.

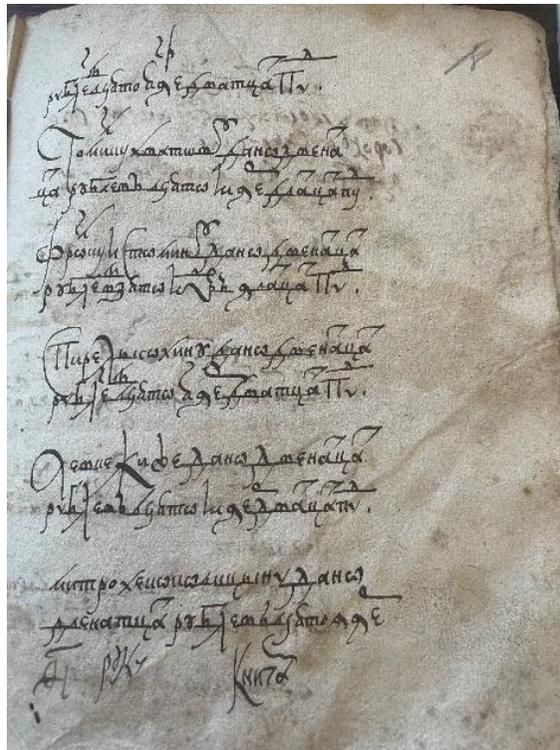


Figure 1 - A fragment of the book of expenses of money taken from the customs and tavern tax collector Grigory Ermolaev to pay for the cannonballs and their transportation to Moscow, 1633 (RGADA:141:1:9:57:18)

It is well known that the generally accepted responsibilities of an accountant include not only the preparation of financial documents, bookkeeping, and reporting, but also the calculation of product cost. As archival sources indicate, this procedure was not always accompanied by the development of an accounting system, and in some cases, it began to be used even before the "triumphant march" of double entry across Europe. For example, Boynes and Edwards (2013) cite examples of the preparation of cost estimates for large landowners' estates in Great Britain and the Spanish Royal Navy at a time when a simple office accounting system was widely used in these countries. Edwards (2011) analyses charge and discharge accounting in landed estates (14th–19th centuries) and reveals a persistent resistance to DEB in England. Such evidence underscores the necessity for further comparative empirical investigation of this trend.

Russian archives also contain costing calculations based on records from account books, which essentially replaced separate analytical accounts for operational accounting. An example is the organization of accounting records in the receipt and expenditure books of the Moscow Printing House, which was traditional for the 17th

century (RGADA:1182:1-3). The Moscow Printing House archive primarily contains 3 types of accounting books: entry books, inventory books, and income and expenditure books. A detailed description of the relationship between information from these various accounting books is provided in Sidorova & Nazarov (2019).

Another example of account books is the Novgorod Mint Record Books for 1610-11 and 1613-17. The Archaeographic Commission published the books for 1610-11, brought from Sweden by S.V. Solovyov, in 1864; they are a valuable written source for studying the history of accounting in Russia (*Acts relating to the legal system of ancient Russia*, 1864). Later books are still kept in the Stockholm State Archives (Berglund & Zakharov, 1983), but the Russian State Archive of Ancient Documents contain microfilms with their copies.

The surviving documents of the Novgorod Mint can be divided into two groups. The first reflects the receipt of raw materials ("old money" and "silver scrap"), purchased in small quantities from various persons. These books contain numerous names of silver suppliers, among whom are many mint workers - money masters, smelters, drawers, padders, etc. (*Readings at the Society of Russian History and Antiquities at Moscow University*, 1890).

The second group of documents reflects the mint's operations. These are the "*Smelting Books...*" and the "*Books of What the Master Gave to the Work...*" These documents record the weight of each batch of silver at key stages of the production chain—before smelting and when given to the mint masters. All of these documents have been preserved in a "clean" form, intended for compiling mint reports. Also discovered in the archives are "rough" mint books, directly related to the daily work of smelters and mint masters. These books, riddled with notes and corrections, contain information on current (not included in the reporting documents) losses during minting, as well as data on the mint masters' payments (Zverev, 1998).

Keeping income and expenditure books was also common among government agencies in the 17th century. An example is the well-preserved income and expenditure books of Veliky Novgorod for the years 1610–1612 (Spassky, 1972).

Regarding the standardization of the format and rules for maintaining income and expense books, we note that no such normative documents dated from the 17th century have been found at the moment. The first regulatory document in the history of the Russian accounting, the Admiralty Regulations (1722) (PSZ, 1830: 255-607), was developed only in the first quarter of the 18th century.

6 Coin production in Russia in the 17th century

The first Russian mint began operations in 1534 during the monetary reform of the ruler of the Russian state Elena Glinskaya (1508–1538). The reform abolished the circulation of private currency, and the minting of coins was monopolized and is now permitted

only in state-owned enterprises. In the second half of the 16th century, in addition to the main Moscow Mint, two provincial mints continued to operate in Pskov and Novgorod. In 1595, on the initiative of Boris Godunov, the Monetary Prikaz was created – a special department to regulate the minting of coins (Zverev, 1998). Russian *prikazy* were state departments checked the inventories of property and cash belonging to the state (treasury) and acted only on the instructions of the Moscow Tsar (Lieberman and Eidinov, 1995:777-778).

During the first half of the 17th century, the rights and production volumes of provincial mints were gradually reduced, and in 1632 they were closed. These mints temporarily resumed operations during the monetary reform of Tsar Alexei Mikhailovich (1655-1663), but later, coin minting was concentrated in Moscow. The monetary reform of 1655 called for the issue of copper coins and their gradual replacement by silver ones (Zverev, 1998; Spassky, 1962). The reform resulted in significant inflation and the so-called Copper Riot of 1662 in Moscow. The people almost tore apart the tsar's father-in-law Ivan Miloslavsky and several other boyars and merchants; hundreds of people died or were soon executed during the suppression of the Copper Riot (Bogoyavlensky, 1980).

The evolution of Russian monetary system was driven by the state and church reforms of the 17th century in Russia: the ascension of the new Romanov dynasty to the throne (1613), the adoption of the Cathedral Code (1649) – the first set of laws in Russia published in printed form, the formalization of serfdom and the transformation of the monarchy into an absolute one during the reign of Tsar Alexei Mikhailovich (1645-1676), and the beginning of the church schism during the reign of Patriarch Nikon (1653).

Another important circumstance was the Russo-Polish war, which required increased funding for the army. In the early 17th century, the Orthodox population of the Polish-Lithuanian Commonwealth (Ukrainians and Belarusians) was subjected to religious oppression by Catholic Poles. In 1653, the Zemsky Sobor in Moscow decided to accept the Ukrainian territories as Russian subjects, after which Russia declared war on the Polish-Lithuanian Commonwealth for the liberation of Ukraine and Belarus. In the summer of 1654, a long, bloody, and large-scale war between Russia and the Polish-Lithuanian Commonwealth began, lasting for 13 years.

There is another point of view among researchers. Hellie (2006) states that “*the major inflationary swing in prices in 1662–1663 was caused not by the war, but by the government’s devaluing the currency. This commenced at the end of the 1650s, when the government decided to try to pay for the war by replacing the silver currency with copper coinage*” (2006:539). Raskov D. (2024) investigates these initiatives through a framework of trust, which operates in three levels: as societal norms and conventions, as public trust in governing authorities, and as an interplay among sovereigns. This framework reveals that inflation correlates with a decline in trust, challenging the efficacy of both the *State Theory of Money* and monetarism.

As mentioned above, in the 17th century, only silver money was in circulation in Russia (Spassky, 1962). At the same time, there were no developed silver deposits yet, and all silver was imported: foreign merchants paid customs duties and paid for goods that constituted a government monopoly (furs, potash, smolchug, etc.) with imported *thalers* (called *efimki* in Russian); the Treasury also directly bought silver items and foreign silver coins. In 1654, the issue of copper money, equal to silver, began to replenish the Treasury. There were almost no copper mines in Russia either, but copper was much more accessible on the international market. The New Moscow English Mint (NMEM) was created for these purposes (Bogoyavlensky, 1980).

The productivity of the NMEM was small, but in a couple of years it was possible to saturate the market with copper money. The treasury accepted payments (taxes, tavern fees, etc.) only in silver, and paid (salaries, for example) in copper. For 100 silver kopecks you could get 104-110 copper ones at that time. Silver almost disappeared from circulation, and prices in copper money began to rise. The rate of copper kopecks rose to 1500 per 100 silver ones. In 1663, Tsar Alexei Mikhailovich abolished copper money. The copper was bought by the treasury at a paltry market price (5 silver kopecks for 100 copper ones) and after some time was melted down into weights (Muravyova, 2008).

The NMEM was located in the center of Moscow, on Frolovskaya (now Myasnitskaya) Street, on the former farmstead of the English company Digby, which is why it was called *English*. Formal relations between the royal courts of England and the Russian state were established in the end of the 16th century. Simon Digby served as an Agent for the Kingdom of England in Russia from 1635 to 1640, not as a full plenipotentiary or ambassador, acting under the English monarch during that period, a role in the complex diplomatic relations between England and Muscovy. Russian Tsar Alexei Mikhailovich was outraged by the execution of King Charles I of England in 1649, after which he expelled all English traders and residents from Russia.

The area of the mint was approximately 6 thousand square meters, and about 300 people worked there. Samples of the copper coins are presented on the Figures 2 and 3.



Figure 2 - Samples of the NMEM's products

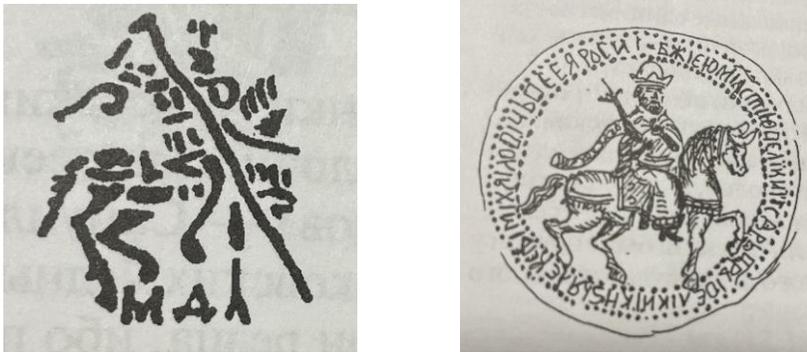


Figure 3 - Samples of the NMEM's stamps on coins

The technological process of producing copper coins consisted of a sequence of several stages, which are shown on the Figure 4.

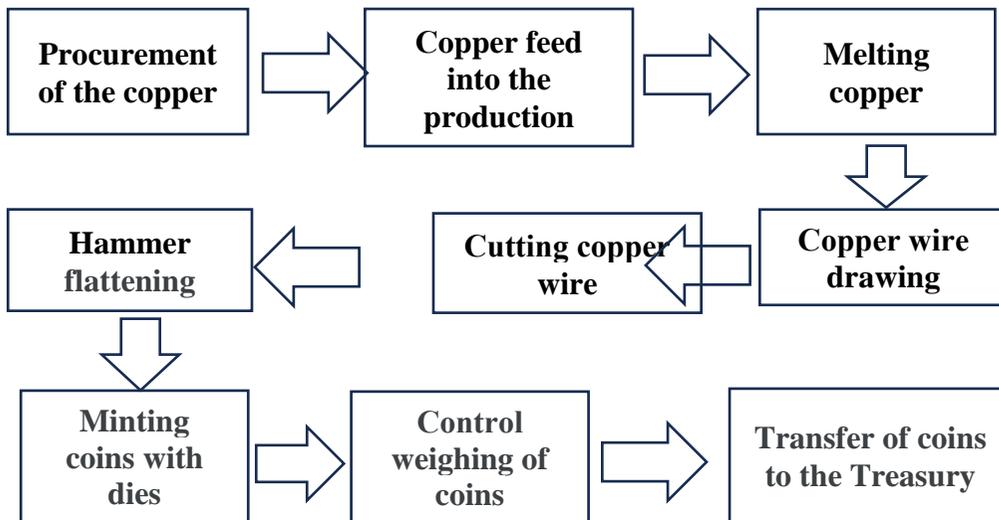


Figure 4 - Technological process of producing copper coins

During the entire period of the NMEM's operation, about 5-6 million small-denomination copper coins were issued here. At each stage of the technological process, all production operations were documented.

7 Account books of the New Moscow English Mint

In order to conduct a comparative analysis, materials preserved on similar Russian manufactories of the 17th century were used. The most similar in terms of the organization of production and the technological chain of production of copper coins to

the NMEM should be recognized as the activity of the Novgorod Mint (Zverev, 1998). The "technological chain" of copper coin production from the procurement of raw materials and tools to the transfer of finished products to the Order of the Great Treasury was analysed and compared with the Novgorod Mint where silver coins were produced. The comparative information is presented in Table 1.

Table 1
Comparison of the NMEM with other Russian manufactories of the 17th century

Comparison criterion	Moscow Printing House	Novgorod Mint	NMEM
Archival sources	RGADA, Fond 1182, Inventories 1-3	RGADA, Stockholm State Archives	RGADA, Fond 368, Inventory 1, Documents 1-6
Placement	Moscow	Veliky Novgorod	Moscow
Period of work	1622-1700	1595-1627, 1654-1663	1654-1663
Legal status	state manufactory	state manufactory	state manufactory
Accountability	The Order of printing	Novgorod Chet, later – the Order of the Great Treasury	The Order of the Great Treasury
Costing method	Specific order costing	Process costing	Process costing
Form of remuneration	Time-based wage system	Piecework system	Piecework system
Basic unit of measurement	Monetary	Physical (weight)	Physical (weight)

The result of the study was a reconstruction of the NMEM's account books, presented in Table 2.

Table 2
The NMEM's Account Books

Stage of the technological process	Premises and equipment	Account books
Procurement of the copper	Administrative building	Books of receipt of copper
Copper feed into the production	Administrative building	Copper raw materials handout books
Melting copper	Smelting workshop	Books for recording how much copper was issued to smelters with their signatures
Copper wire drawing	Blacksmith sheds, forges, anvils	Notebooks of copper distributed to blacksmiths, notes for drawing boards
Cutting copper wire	Workshop, wire drawing machines	Books of distributed copper by the master to the workers in the processing
Hammer flattening	Anvils	Book of coin minting tool
Minting coins with dies	Chisels, stamps	Books on used coin minting tools and dies
Control weighing of coins	Administrative building, scales	Notebooks, how many coins were received from production (with masters' signatures)
Transfer of coins to the Treasury	Sealed rag bags	Records of sending coins to the Order of the Great Treasury and other orders and giving to all kinds of people

In addition, a significant number of account books related to control procedures at all stages of the technological process were identified (for example, *Cases of embezzlement and copper crumbs, A notebook of copper coins that were found on*

working people and thrown over the fence, laims for strife and dishonor, for debt obligations and others). Archival documents provide evidence of a large number of thefts, concealments and attempts to steal coins by NMEM's employees. To combat these negative phenomena, enhanced control measures over production processes were introduced at the NMEM.

8 Results and Discussion

The Russian state went through the most difficult stage of its formation in the 17th century. It was an era of the consolidation of the Russian state, the awareness of the power of state power as the center and driving force of the management of public life. Political and religious reforms and the conduct of bloody wars required significant state financial resources. The state manufactories were increasingly controlled by the state and were subordinated to the political tasks of the highest authority.

It is particularly important for our subject of study, that all of these processes were accompanied by a gradual but consistent centralization of coinage in Russia, which was finally completed by the mid-17th century. Even at the beginning of the 17th century, it was possible to issue coins with various designs and denominations, which were carried out at the direction of private individuals, but soon the Prikaz of the Great Treasury became the main administrator in the field of monetary affairs. The centralization of coinage was accompanied by increased state control over coin production and the application of stricter and more standardized accounting and control procedures at mints. An example of the above accounting practices are the books of the NMEM.

Account records at the NMEM were made at each stage of the technological process, and a simple entry was used (separately - receipt books and expense books). The main goal of government agencies in the production of coins was strict control over the safety of raw materials and finished products. This was the reason that special books were intended to ensure control over the safety of raw materials and finished products, as well as the implementation of supervisory and punitive functions of the Great Treasury.

Payments for employees were made with a part of the products (copper coins), therefore, account books at the NMEM were kept mainly in physical terms (poods, *hryvniyas*), cost accounting was kept separately in the order of the Great Treasury and the Novgorod Cheti, where the financial result from minting coins was revealed.

The results of the study of archival documents confirm that the accounting and control procedures at the NMEM demonstrates the presence of original and quite advanced bookkeeping for a manufacturing enterprise in Russia in the middle of the 17th century. The development of Russian accounting at that time was greatly influenced by

the experience of maintaining income and expenditure books at large state-owned manufactories.

Despite the interesting and original research results, the question of the applicability of the comparative method, as well as the method of logical-analytical modeling in the presence of a limited number of authentic documents, remains open.

Future research should be aimed at analyzing the role of accounting as an advanced management tool in the 17th century and its significant impact on the strengthening of Russian state financial control.

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