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INFLUENCE OF NATIONAL POLICY ON THE ESTABLISHMENT OF UKRAINIAN AGRICULTURAL RESEARCH IN THE 18TH–19TH CENTURIES

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ABSTRACT

The relevance of the state role in ensuring the activities of branch educational and research institutions is conditioned by the current state of development of the Ukrainian agro-industrial complex. The purpose of the study is to investigate the policy of the Russian Empire from the standpoint of the impact of state measures on the beginning of the scientific and organisational foundations of Ukrainian agricultural research. The methodological basis of the study is the principles of historicism, objectivity, consistency of scientific analysis and synthesis. The significance of horticulture in the origin of the Ukrainian industry experimentation has been analysed. The transformation of the worldview of the central Russian government regarding agricultural production from the standpoint of forming the prerequisites for sectoral research is revealed. The main stages of the evolution of government policy on agriculture from purely fiscal to state-based have been established. The study examines the evolution of the functions of the Scientific Committee, which at the time of the foundation of the Ministry of State Property in 1837 was an institution with administrative and advisory powers, and which, under the conditions of the creation of the Ministry of Agriculture and State Property, turned into a complex of research institutions. The significance of specialised scientific and research bureaus of the Scientific Committee in terms of their role in shaping the system of state scientific support for the needs of the agricultural sector has been revealed.

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INTRODUCTION

The phenomenon of industry research in the sense of modern natural science has become the result of a complex action of many factors of social life. From the standpoint that 80% of Ukrainian ethnic territories have been part of the Russian Empire since the end of the 18th century, there is every reason to speak of the mainly Russian roots of agricultural experience in Ukrainian lands. Born in the Neolithic period simultaneously with the emergence of the reproductive economy (agriculture and cattle breeding), industry research, as a branch of knowledge, has gone through a long path of development from empirical observations to an independent branch of scientific natural science knowledge, or, in the apt expression of Professor A. Doyarenko (1921), "molecular work to strengthen the role of research in the rise of crops" from the standpoint of state interests. The evidence of recognition of the production potential of research at the state level as such, which can ensure the intensification of agricultural

production and modernisation of the country, became a creation of the first permanent state-owned industry research station – Poltavske experimental field – on October 28, 1884. With state support, the effectiveness of industry research has significantly increased, and the system of state regulation and the programme of activities of research institutions, which developed at the turn of the 19th-20th centuries, remained until the 1920s. At the same time, research institutions were created by individuals, academic scientists, scientific societies, country councils, and public organisations, which makes it impossible to absolutize the role of the state in the development of agricultural research. Despite the obvious backwardness of the agricultural sector of the Russian Empire, the central government did not connect the problem of its low profitability with the lack of a state approach to regulating agricultural production through comprehensive government measures almost until the end of the 18th century. In particular, it involved the dissemination of agricultural knowledge through institutions of higher branch education. Therefore, the beginning of the system of agricultural education at the turn of the 18th-19th century reflected the growing role of the state in solving agricultural problems at the level of government practical actions. From the beginning of its foundation, institutions of higher agricultural education operated as centres of scientific theoretical training and practical scientific research. This has allowed the academician of the National Academy of Agrarian Sciences of Ukraine (NAAS) (Vergunov, 2019) to conclude the birth of "agricultural research from the bosom of higher branch education".

The relevance of the state role in ensuring the activities of branch educational and research institutions is conditioned by the current state of development of the Ukrainian agro-industrial complex (AIC). Despite the widespread declaration at the highest levels of government of the priority of agriculture in the Russian Federation for the Ukrainian economy, Ukraine now imports products from abroad that it originally produced itself. However, as early as 1855, in the preface to the published "Review of actions of the Department of Agriculture" (1855), the compilers of the collection noted that experiments are "too expensive for individuals and often integral to failures and irreversible costs", and therefore, the state should "make it easier for owners to improve the agricultural industry". Nowadays, as more than a century and a half ago, industry research remains an area of high-value intellectual and practical activity that requires systematic state support. And therefore, the study of the evolution of state agrarian policy from the standpoint of its impact on the development of research as a branch of natural science and organisation deserves attention. The purpose of the study is to investigate the evolution of the agrarian policy of the Russian Empire from the standpoint of its conditionality of formalisation and institutionalisation of agricultural research on Ukrainian lands, which were part of the Romanov empire (Left-Bank, Right-Bank and Southern Ukraine). The chronology of the study covers the 18th–19th centuries. The lower chronological limit is determined by the beginning of the first systematic measures of the Russian government to regulate the agricultural sector and develop science during the reign of Peter I, who, according to academician Vernadsky (1988), introduced scientific research in Russia as a matter of national importance and steadily contributed to the development of technology and natural science. Sometimes the logic of research required deepening the lower limit to clarify the historical prerequisites for the emergence of industry research. The upper limit is conditioned by the establishment in 1894 of the first specialised Ministry of Agriculture and State Property in the history of the Russian Empire, which regulated the industry research.

METHODOLOGY

The historiography of the topic includes a range of studies, the authors of which from different perspectives considered both the policy of the Russian government on agriculture and the emergence of research as an independent branch of natural science and organisation. Among the works of the pre-Soviet period, the study by Academician Vernadsky (1988) on the history of natural science in Russia in the 18th century is of particular importance, the first section of which was published in 1914. One of the very first models of the development of Ukrainian research was proposed by the state councillor, professor Dokuchayev (1953; 1895). The publication of Professor Barakov (1908) considers the development of research in the context of the creation in 1865–1867 by Professor D.I. Mendeleev on behalf of the Free Economic Society (FES) of the experimental field for conducts experiments with fertilisers. Methodological approaches of exploration are determined considering the

conclusions set out in the report at the celebrations of the 25th anniversary of the Poltavske experimental field (1884–1909) of the assistant director of the Kharkiv Regional Agricultural Experimental Station, Yenken (1912), which, in particular, presents the history of agricultural research and analyses the influence of Western European industry research on it. Specific measures of the state for the development of research business and research institutions during 1840–1910 are studied by Viner (1922), who chronologically refers to the Soviet period of historiography. The strategy of this study was influenced by the scientific guidelines laid down by the speech of Professor Doyarenko (1921) during the opening of the 7th All-Russian Congress on Research in June 1921.

From the experience of history, researchers raised the question of the importance of agricultural research in the process of state restoration in the transition to peaceful life and analysed external economic, social and political factors that directly affect the growth of public interest in industry research. These factors include 1) natural disasters and crop failures; 2) the agricultural crisis, overcoming which requires attracting "new energy sources"; 3) re-equipment of agriculture "at new beginnings" (Doyarenko, 1921). Important achievements of Soviet historiography include the papers by Pshenichny (1964), in particular the abstract of his dissertation devoted to the study of agricultural experimental work in Russia and Ukraine up to 1917.Features of the establishment of scientific and organisational bases for the operation of agricultural research on the territory of Ukraine in the second half of the 19th century – at the beginning of the 21st century studied by academician of the National Academy of Sciences Vergunov (2019). In particular, researchers have proposed periodisation of origin and development of agricultural research as a branch of scientific knowledge (Vergunov, 2019) and analysed theory and practice of Ukrainian industry research in the context of state regulation of the development of the agricultural sector (Vergunov, 2019). The historical path of agrarian science and the most important reform transformations in Russia in different epochs are considered by academician (Nikonov, 1995). In the post-Soviet space, the most complete history of agricultural research institutions is presented in the monograph of Elina (2008). From the standpoint of the purpose of this study, attention is drawn to the work of Voronov (2013) from the history of the Ministry of Agriculture of the Russian Empire of the 19th – early 20th centuries. In modern scientific discourse, the problem of scientific and organisational foundations of the establishment and development of agricultural research in the system of higher branch training of Ukraine has become relevant (Holikova, 2020; 2021).

The source base of the work consists primarily of printed documents – personal decrees and orders, which are presented in the official publication "complete collection of laws of the Russian Empire. Important issues of the national policy on the development of branch scientific research allow analysing the printed publications of the Ministry of State Property (Review of the actions of the Department of Agriculture…, 1854; Historical review of fifty years of activity of the Ministry of State Property…, 1888; Gins and Shafranov, 1914) and historical materials from the published archive of this Ministry (Veshnyakov, 1891). The methodological basis of the study is the principles of historicism, objectivity, consistency of scientific analysis and synthesis. The principle of historicism allows studying the genesis and evolution of research as a process that developed over a particular time in a set of historical relationships and interdependencies. The principle of objectivity allows analysing the development of industry research in the totality of the entire range of specific historical circumstances, highlighting the potential opportunities of research for the Ukrainian agro-industrial complex. The study also uses general scientific and special historical methods. The investigation of printed and archival sources led to the use of methods of analysis, synthesis, generalisation, classification, and systematisation.

RESULTS AND DISCUSSION

The beginning of research as a branch of knowledge falls on the Neolithic period when there was a transition from appropriating methods of management to reproductive ones – from collecting useful plants to growing them, from the hunting of animals to domestication. Land husbandry (field farming, horticulture) and cattle breeding for many centuries were identified with the concept of "Agriculture", which remained the dominant form of the European economy until the first industrial revolutions (Kasyanov, 2014; Strapchuk and Mykolenko, 2021). The emergence of a productive economy led to the emergence of agrarian civilisation, the foundation of

which was developed by generations of farmers and pastoralists of narrowly empirical knowledge on increasing the productivity of plants and animals (Denissova and Born, 2021; Didora and Kluchevych, 2021; Masliiov and Korzhova, 2021). The original customs of our ancestors inherited from our grandfathers and great-grandfathers, and simple observations of natural phenomena, were the only source of knowledge of farmers for several millennia and did not need state regulation.

Until the end of the 18th century, agriculture remained a rather primitive sphere of economic activity. The most convincing evidence of the conservatism of agricultural production and its immutability for a long time was routine agricultural tools – ard, plough, and sokha, and a three-field farming system saturated only with grain crops (fallows, winter, spring), which restricted the development of animal husbandry since it practically excluded the cultivation of forage plants (Nikonov, 1995). Although the transformations that took place during the reign of the most famous Russian reformers Peter I and Catherine II gave a powerful impetus to the development of science and the economy as a whole, they had little impact on agricultural production in the country. The foundation of the St. Petersburg Academy of Sciences in 1724, the opening of the first imperial universities, the activities of individual progressive landowners in the use of grass and fruit cultivation, the invitation of foreign agronomists to spread new crops (potatoes, corn, tobacco, etc.) – these are undoubtedly very important, but isolated innovations that could not lead to systemic positive changes in agriculture. Moreover, the socio-economic foundations of the feudal-absolutist system remained intact. At the same time, the increase in the population in the empire required the expansion of agricultural production, but the only original tool for this was the traditional low-efficiency extensive economy. The prerequisites for the intensification of agricultural production were laid only at the turn of the 18th-19th century due to the achievements of outstanding natural scientists – experienced amateurs and talented academic researchers.

The beginning of rationalisation and intensification of agriculture based on scientific achievements is primarily associated with agriculture. Experimentation with field crops was preceded by an experimental case on the cultivation of gardens first in Orthodox monasteries, and later – in princely and royal estates and private property. According to the chronicles, gardens with various flowers and fruit trees existed in Kyivan Rus during the time of Volodymyr the Great (reign: 980–1015) and Yaroslav the Wise (reign: 1019–1054). Based on the Byzantine tradition, fruit orchards were arranged in church monasteries, where monks grew cherries, apples, pears, plums, currants, "bersenya" (gooseberries), raspberries, etc. (Regel, 1896). Agricultural education was born faster at the same time, and horticultural monks were the first experimenters in crop production. Monastic gardens were associated with the biblical Eden, so in Russia, they were given sacred significance. Information on the history of the "apple orchard" at the Kyiv Pechersk monastery is contained in the Biographies of the Holy Fathers. This garden was founded around 1051 by the monk Anthony on his return from mount Athos; its creation in time coincides with the foundation of the Kyiv Pechersk Orthodox monastery (Regel, 1896; Cherny, 2010). Nestor the Chronicler (circa 1056 – circa 1114) talked about the gardener monk Mikula from Vyshgorod, near Kyiv, in "The Tale of Bygone Years" (Cherny, 2010). At the personal request of the princes, the monks arranged gardens on their estates. In the first half of the 12th century, prince Yuri Dolgoruky, when moving from Kyiv to the Northeast, brought with him experienced Greek monks from various crafts – they laid the first gardens in Suzdal and Vladimir (Regel, 1896). The Ipatiev Chronicle talks about the "beautiful garden", planted in 1259 during the reign of Daniel of Galicia (reign: 1238–1264) (Russian chronicle according to the Ipatiev list..., 1908). Moscow gardening was born at the beginning of the 14th century with the move of Metropolitan Peter of Kyiv, born in Volhynia, from Vladimir to Moscow in 1325. At the same time, experts refer to the beginning of the generation of biological terminology in the old Russian language: "zavyaz" (ovary), "scheplennya" (grafting), "zhivets" (propagule), "chereshok" (petiolule), and the like. In Europe at this time, botanical, physiological, or zoological terms were used exclusively of Latin or Greek origin (Kudrenko, 2006).

Information about the development of horticulture in the Ukrainian lands during their entry into the Grand Duchy of Lithuania and the Polish-Lithuanian Commonwealth is not enough in Ukrainian historiography. A. Regel (1896) gave important facts about horticulture in the Ukrainian lands within Poland.

In particular, he reported on the "beautiful monastery gardens in geometric style" in Galicia, which were laid earlier than the middle of the 17th century, in the "pre-Petrine times", and also noted that Polish gardens were built under the influence of Western European landscape art – French, English, Dutch. The practice of growing gardens in Russian Orthodox monasteries has prepared the emergence of secular gardening. The first among the secular gardens were the royal, or apothecary, vegetable gardens. The first royal vegetable gardens appeared in the middle of the 15th century and initially had a utilitarian meaning – fruit trees and medicinal plants were grown there. Subsequently, the Apothecary ordinance was created – first as a palace institution that took care of the health of the royal family. The question of the date of foundation of the Apothecary ordinance (from 1672 – the Apothecary Chancery) as a permanent authority is debatable. Historians usually referred to 1614 (Petrov, 2005) or 1620 (Pshenichny, 1964). However, the analysis of sources showed that it was most quickly created around 1581 at the same time as the first official "royal pharmacy" or a little later (Koroteyeva, 2011). The Apothecary ordinance became a body of national administration in the second half of the 17th century, which means that industry research, which was founded in the apothecary gardens of monasteries, prepared the creation of a state institution for the management of the entire industry (Hlushchenko and Sahaidak, 2021).

The first golden age of the royal gardens occurs in the second half of the 17th century, which is conditioned by the measures taken by tsar Alexey Mikhailovich (reign: 1645–1676) to arrange gardens and introduce foreign plants. In 1663, in the royal fiefdom of Izmailovo, work began on creating an exemplary complex with fields, gardens, an apothecary garden, pets, ponds, a hunting farm, a menagerie, glass, and iron foundry production, etc. Experts refer it to one of the first regular gardens in Russia, which presents it as one of the very first botanical gardens in the country. According to the expenditure book of the order of secret affairs of 1670, two large groups of people involved in garden construction worked in Izmailovo: 1) gardeners; 2) garden specialists. Scientists have proved that the main population of representatives of the second group were foreigners and natives of South Russian and Ukrainian lands (Cherny, 2010). Historians admit that they know little about the gardens of the 16th–17th centuries. However, it is unequivocally claimed that the gardens were different in purpose, appearance, size, and location: from miniature "hanging" gardens on terraces near the royal mansion to huge country lands-menageries created for falconry and dog hunting (Vergunov and Gorokhov, 1988).

A separate place in the history of Ukrainian horticulture is occupied by the largest botanical institution of its time in Gorenki, near Moscow, founded in 1750 by the Razumovsky family. The garden has not been preserved, but a lot of interesting information remains from the history of its collections and greenhouses. There were about 10 thousand plant species in the garden herbarium. Of particular value was the collection of Siberian and Oriental plants. Various types of palm trees, bananas, bamboos, sugar cane, tea, olives, oranges, etc. were acclimatised there. Peaches, apricots, and grapes were grown in special ground sheds (Kudrenko, 2006). In 1809, based on Gorensky garden, the first botanical scientific association in the Russian Empire, the so-called Gorenskoe phytographic society was created. Its founders were a German botanist and since 1805 the first director of the Botanical Garden of the Faculty of Biology of Moscow University, professor G.F. Hoffmann (1760–1826); director of the Gorensky garden F. B. Fischer (1782–1854); MUDr., botanist O.Ya. Liboshits (1783–1832) and the owner of the Gorensky garden, minister of public education of the Russian Empire in 1810–1816, count O.K. Razumovsky (1748–1822). The purpose of the society was purely academic research tasks – the dissemination of botanical knowledge in close cooperation with botanists from different countries of the world. In 1812 the phytographic society has merged with the Moscow society of nature researchers. After the death of O. K. Razumovsky in 1822, the Gorensky Botanical Garden was left without the necessary funding, which led to its decline, and the head of the garden, F.B. Fischer, because of his extensive experience in managing a scientific botanical institution, was appointed in 1823 as the first director of the St. Petersburg botanical garden (Shevchuk, 2010).

Garden and park complexes created in Ukrainian lands during the 18th–19th centuries had their characteristic imprint, caused by peculiar natural conditions and features of the historical development of Ukrainian lands. At the same time, the arrangement of gardens in Ukraine was significantly influenced by both Russian and pan-European traditions, in particular the Polish

school of landscape art. To the greatest extent, this applies to such large complexes as "Kachanivka" (est.: 1670s), "Sofiyivka" (1796), "Trostyanets" (1830s), "Vesely Bokovenki" (1893). The author of the fundamental work on the development of the unique park "Sofiyivka" based on the analysis of all known publications of the 19th – first half of the 20th century in Russian, Ukrainian, Polish, and French is a Ukrainian botanist, specialist in the field of dendroflora and landscaping A. Lypa (1907–1990) (Lypa, 1948). He also owns the periodisation on the introduction and acclimatisation of woody plants of Ukraine from ancient times to the middle of the 20th century, according to which four periods are distinguished: 1) from ancient times to the middle of the 17th century – this period ends with the arrangement by Metropolitan Peter Mogyla of Kyiv and Galicia of the first of the reliably known ornamental and fruit orchards in Kyiv at the Holosiivsky estate of the Kyiv Pechersk Lavra in 1631; 2) from the middle of the 17th century to the beginning of the 19th century – at this time the first apothecary gardens, ornamental gardens, and parks were established in Ukraine, which later became widely known; 3) from the beginning of the 19th century to 1917; 4) the Soviet period (Lypa, 1960).

Experts assign a key role in the history of plant introduction in Ukraine to the acclimatisation garden of I.N. Karazin (1780–1836), founded in 1803 on the Osnovyntsi hamlet of the former Bogodukhov uyezd of the Kharkiv province (today, the Krasnokutsky arboretum is a monument of landscape art) (Rubtsova, 2006). Many authors, relying on the works of his son I.I. Karazin (1834–1903), prove that Krasnokutsky park was founded at the end of the 18th century (in 1792 or 1793) by the brothers V.N. Karazin and I.N. Karazin (Berezyuk and Gramma, 2003). Botanist-acclimatiser I. N. Karazin created an arboretum unique for the forest-steppe zone of Ukraine, where more than 500 (according to other sources – more than 600) varieties of apples, pears, plums, cherries, etc., were grown. In addition, the researcher carried out systematic work on the naturalisation of a large batch of foreign trees and shrubs (231 species) in Osnovyntsi, on land unsuitable for agriculture. The results of the research work are published in Ukrainian periodicals. After the tragic death of Ivan Nazarovich in 1836, the work has stopped. It was later resumed by his son I.I. Karazin only in 1858. Two generations of the Karazin family studied 400 species of foreign trees and shrubs in Osnovyntsi. About 70 species were first distributed in the gardens and forests of Ukraine (catalogues, unfortunately, have not been preserved) (Fischer-von-Waldheim, 1913). Thus, horticulture has long been in the sphere of state regulation. On the initiative and direct participation of the monarchs, the first experiments on acclimatisation, agricultural technology, etc., were carried out. At the turn of the 18th-19th centuries, the arrangement of gardens came out of the care of monarchs, which was primarily caused by the general development of natural science – from the sphere of amateur interests of outstanding experimenters, it moved to the curricula of universities and agricultural educational institutions, and was the subject of attention of scientific societies.

Since the end of the 17th century, Russian landscape art was inspired by borrowed Western European experience thanks to the reform initiatives of Peter I (during his reign: 1682–1725). In his time, a network of apothecary gardens and pharmacies appeared, the state system of collecting medicinal plants was founded; the first botanical gardens were created as a perfect form of apothecary gardens, which accumulated all the achievements of gardening at that time. The Apothecary Garden in Moscow was founded in 1706 with the direct participation of the Russian tsar (now it is called the Lomonosov Moscow State University Botanical Garden), and in St. Petersburg, according to the director of the Botanical Garden during 1896-1917 O. Fischer von Waldheim, – in 1713 (Fischer-von-Waldheim, 1913). Peter, I did a lot for the development of agriculture. His activities covered almost all branches of agricultural production: the development of new agricultural territories was started and the acreage under industrial crops was expanded; breeding cattle (horses, Dutch cows, Spanish fine-fleeced sheep, etc.) were imported from abroad; new crops were introduced; improved tools were distributed among farmers (instead of sickles – scythes and rakes), etc. According to the head of the reference and publishing bureau under the Department of Agriculture, Morachevsky (1914), Ukraine occupied a special place in the emperor's reform measures, because "God blessed it better than other lands of the Russian state, where even the air contributes to the reproduction of sheep and the production of good wool." Therefore, the Manufactory board responsible for the development of industry published "special rules" for sheep breeding in Ukrainian ("Little Russian").

Peter I's activities are associated with the government initiative to harvest medicinal plants in Glukhiv (1706) and Lubny (1709) in the Poltavska Oblast. The apothecary business in Glukhiv was not successful. However, it was to the administrative capital of the Left Bank of Glukhiv that received 12 pounds of seed potatoes from St. Petersburg in 1765, with detailed instructions for breeding "ground apples"; hence the fruits of "amazing taste and satiety" were distributed throughout Ukraine. Today it is difficult to confirm the accuracy of this information, and therefore, simultaneously with this version regarding the distribution of potatoes in Ukrainian lands during the time of Catherine II, there is another, according to which potatoes in Ukraine appeared during the hetmanate of I.S. Mazeppa, and in the 1730–1740, it was already quite widespread, thanks to German immigrants (Onatsky, 1959). In 1709, on his way from Poltava to Kyiv, the tsar stopped at the Mhar Monastery, six kilometres southeast of Lubny. As in any medieval monastery, Mhar had a garden complex divided into fruit, flower, household, and medicinal gardens. Monks grew medicinal herbs in a 12 arpent field in Terny village. Having examined the plantations with medicinal herbs, the tsar ordered to create a temporary pharmacy in Lubny with an apothecary's warehouse at a camping hospital. According to the royal decree of August 25(14), 1721 "On the establishment of pharmacies in cities under the supervision of a medical board, to help in the search for medicines in the provinces and on the existence under the supervision of the specified board of hospitals" (Complete collection of laws of the Russian Empire, from 1649…, 1830) a permanent state-owned pharmacy with two pharmacy warehouses was opened in Lubny, and in Terny villages, two pharmacy gardens with a total area of 50 arpents were established.

Ukrainian historiography contains somewhat contradictory information from the initial history of the foundation of the garden of the field pharmacy in Lubny, in particular on chronology (Complete collection of laws of the Russian Empire, from 1649…, 1830; Vergunov, 2016; Shadrina, 2019; Garmash and Zub, 2015), which can be explained by the lack of sources. Researcher of the history of Poltavska Oblast I. Pavlovsky (1915) noted that in the archives of Poltava there is no case of the Lubny pharmacy, and in the provincial archive there are only four cases of the construction of a pharmacy room in Lubny. But according to the same historian, students of the Lubny pharmacy and the entire "population of the Lubensky uyezd collected medicinal herbs and earned considerable sums on this." The most complete, and, most importantly, critical, history of the Lubny garden is described by a full member of the Poltava scientific commission, a historian Astryab (1917). However, according to M. Grigorovich, the widespread version regarding the emperor's personal allocation of a land plot in Lubny for breeding medicinal herbs has no documentary evidence, because all the movements of the tsar after the Battle of Poltava are recorded in the "Marching journal". In particular, the fact that heading from Poltava to Kyiv (almost 298 km), the tsar kept a course for Reshetylivka–Balakliika–Khorol–Lubny–Yablonov–Yagotyn, which he passed in three days and entered Kyiv on the fourth. The record of the tsar's visit to the Mhar Monastery was made according to the memoirs of the elders on August 6, 1772, and therefore, 63 years after the Battle of Poltava, and there is no other documentary confirmation of this fact. The reason for the appearance of these legends, according to the historian M. Astryab, is the foundation of a pharmacy in Lubny in 1721; according to the researcher, this extremely important event for the townspeople was reflected in folk tales (Astryab, 1917).

Apothecary in Lubny, like other apothecary gardens, was engaged in collecting and growing medicinal plants. The first pharmaceutist in it was the German Ivan Ivanovich (Johann) Geiter; in 1728, based on permission from the medical office, he opened the first private pharmacy in Kyiv. Modern historians suggest that its foundation in 1721 marked the beginning of Ukrainian industry research as an organisation created under the care of the state in Ukrainian lands (Vergunov, 2019). During the reform of the pharmacy business under the imperial decree of May 20(9), 1736 (P. 12), the pharmacy in Lubny was set as an example to other field pharmacies, of which there were four at that time (except Lubny, in Moscow, St. Petersburg, Riga) and it was indicated that all new pharmacies should be organised on its example from the standpoint of the wartime requirements. In 1721, all apothecary gardens exchanged plants, seeds and books through the medical office, created by the tsars' decree. Pharmacies were also equipped with greenhouses, drying rooms, and laboratories (Fischer-von-Waldheim, 1913). Like monastic gardens in their time, apothecary gardens in the 18th century were conductors of special knowledge on crop production and

centres of experimentation. They laid the foundation for the emergence of botanical gardens. Lubensky botanical garden operated from 1766 to April 1862, when it was eliminated to reduce government spending.

Despite the diverse activities of Peter I on the development of agriculture, there was no special government institution for managing the agrarian economy in the state until 1717. According to the tsar's decrees of December 22 (11), 1717 "On the staff of colleges and the time of their opening" and December 26 (15), 1717 "On the appointment of presidents and vice-presidents in the collegiums" (1830) collegiums were created as central bodies of industry administration (they existed until 1802 when they were included in the newly formed system of ministries). Headed by duke D. M. Golitsyn (1665–1737) Chamber Board was the central financial institution of Russia, which was supposed to be responsible for state revenues, state contracts and sales of state-owned goods. Following the decree of December 22 (11), 1719, approved by Peter I on the "Establishment and regulations of the state Chamber Board", the main activity of this body was to fill the state budget. At the same time, the chamber board had to take care of "the condition and fertility of each province, ... to gradually inhabit deserted courtyards and lands, and also to increase agriculture, cattle breeding, and fishing everywhere ... to increase and multiply" (Complete collection of laws of the Russian Empire, from 1649…, 1830). The Chamber Board began its work in 1721, but soon after the death of the emperor, in 1725 under his successors, – as noted by V. Morachevsky (1914), – state measures for the development of agriculture have significantly weakened.

For the first time, the issue of systematic state regulation of the development of agriculture was reflected in the "Order of the Commission on drawing up a draft of a new code" by Catherine II (reign: 1762-1796) of August 10 (July 30), 1767 (Complete collection of laws of the Russian Empire, from 1649. First meeting. Volume XVIII…, 1830). This legislative document, probably for the first time in Ukrainian history, regulated the sectors of government activities for the development of agriculture, and agriculture is recognised as "the first and greatest work for a person", which should be included as laws (Ch. 12, Art. 297), and encouragement (Ch. 12, Article 313). The authorities abandoned the understanding of agriculture as a traditional occupation of the rural person and focused on the need to "plant" rational agriculture that can "feed an entire nation" (Ch. 12, Article 279). Some articles recall the ideology of enlightened absolutism, of which the empress was a supporter and to which she paid tribute at the beginning of her reign: "... agriculture cannot flourish here, where no one has anything of their own... for every person cares more about their own than about what belongs to another person" (Ch. 12, Art. 295-297). In general, the main provisions of the order remained unimplemented due to their contradictory nature and, in the end, a change in the vector of national policy.

Important innovations in the introduction of the system of state regulation of agriculture were made by Pavel I (reign: 1796–1801). According to his decree of March 15 (4), 1797, a special Commission of state economy and guardianship of foreign and rural households was created under the senate. The Commission, in particular, included the archpriest of Sofia, an expert on agriculture A.O. Samborsky and former director of home economics of local provinces collegiate adviser Tatarinov (Complete collection of laws of the Russian Empire, from 1649. First meeting. Volume XXIV…, 1830). The following decree of Paul I, which was signed on the same day, among other things, defined the tasks of the expedition to organise a school of agriculture: "It is impossible to explain and prove various details of agriculture without practical experience, so a special school should be established under the supervision of the Commission, where theoretical and practical instructions will be taught" (Complete collection of laws of the Russian Empire, from 1649. First meeting. Volume XXIV…, 1830). Under this decree, on May 11 (April 30), 1797, the National Pavlovsk Practical School of Agriculture was founded near the Russian capital. It was created with the aim of "Bringing rural housing to the most successful order and the most reliable arrangement", with the allocation of land "for approval through experiments of evidence of extensive teaching on agriculture" between the Charlevo village and the Moscow Road (now the village of Tyarlevo, connecting the cities of Pushkin and Pavlovsk) (Complete collection of laws of the Russian Empire, from 1649. First meeting. Volume XXIV…, 1830). The government has allocated more than 252 arpents (about 277.75 hectares) for the organisation of the school, including 60 arpents for the experimental field. In its activities, the Pavlovsk school combined educational, research, design and technological tasks. The experience of the practical school has become an

important factor in the establishment of state agrarian policy, including on agricultural education and research.

At the beginning of the 19th century, the management of state peasants, state villages and property were assigned to the competence of the Ministry of Internal affairs and Finance (est. 1802), which included the Department of State Property (Complete collection of laws of the Russian Empire. First meeting. Volume XXVII…, 1830). The main task of the new government body was to fill the state budget therefore, officials saw the free peasants as only a source of income. Problems of ensuring the development of agriculture and the growth of the solvency of peasant farms remained out of their sight. This was the main reason for the foundation on January 7, 1838 (December 26, 1837) of the Ministry of State Property, the organisation process of which was personally supervised by the emperor Nicholas I (reign: 1825–1855). Historians often associate the establishment of this Ministry with the large-scale famine that the country experienced in 1833–1834. Notably, in the history of Russia, there was a long series of famine years, and written information about the first famine dates back to 1024. Only in the 18th century, a famine occurs 34 times; during 1800-1854 there were 35 crop failures. In addition, the authorities did not control the situation with bread in the regions and did not influence pricing policy. For example, in the Volyn province of 1830, rye was sold for 25 rubbles, while in Ekaterinoslav province it was sold for 2.5 rubbles. In 1842, the government stated that crop failures are repeated every 6–7 years and last for two consecutive years. And yet, as early as 1819, the Committee of Ministers stated that in Russia "because of its length and diversity of the Earth's climate and soils", there has never been and cannot be a widespread famine no matter what the shortage is; and therefore, in the conditions of free trade in bread and the availability of convenient communication routes, not only hunger but also a shortage of bread should not occur" (Andreevsky, 1893). However, this position was not shared by all officials.

September 23, 1833, one of the most prominent statesmen and chairman of the Free Economic Society in 1823–1840 admiral, later count M.S. Mordvinov (1755–1845) in a special note addressed to emperor Nicholas I outlined his understanding of the reasons for the shortfall of 1833 and the crop failures of previous years: "the abundance and quality of fruits depend on the degree of education in the science of agriculture, which is still little known in Russia because it is not taught in any of the educational institutions. The farmers plough, sow, and reap, as ploughed, sowed, and reaped a hundred years ago, and the yields are four times less than in improved farms" (Historical review of fifty years of activity of the Ministry of State Property…, 1888). To eradicate ignorance and turn Ukrainian agriculture into art, M.S. Mordvinov as a representative of the only central agricultural, though not governmental, body at that time, has proposed: 1) to allocate funds for training young people in practical agronomy in Russia and other countries; 2) to establish the publication of cheap manuals on agriculture and the manufacture of improved agricultural tools; 3) to establish an agricultural institute and an exemplary estate. As a result, the Ministry of Finance established the publication of the "Agricultural newspaper" on July 15 (3), 1834, on the pages of which materials on field farming, horticulture, forestry, and reviews of the economic life of Russia were published. A workshop for the manufacture of various advanced tools was also organised at the St. Petersburg Institute of Technology and a mechanical institution for the manufacture of agricultural tools by brothers Nikolai and Johann Butenop was expanded (since 1874 – the company E. Lipgart and Co.). And finally, according to the decree of Nicholas I of May 6 (April 24), 1836, the Gory-Goretsky Agricultural Institute was founded. All these innovations were caused by the need to re-equip the economy of landowners and state farms to eliminate the threat of crop failures and famine in the future. At the same time, the Committee for the Improvement of Agriculture, headed by M.S. Mordvinov, developed a project to create the Office of the Chief Director of agricultural institutions with broad powers and a large staff of officials, which governed "all agricultural institutions of the empire" (Veshnyakov, 1891). The plan to create this institution can be considered as an attempt to organise the first relevant ministry. However, for financial reasons, this idea was not widely supported.

The Ministry of State Property, established in 1837 by decree of the emperor, was supposed to implement measures to increase the profitability of the state village (and therefore prevent famine) to prove to the landlords the expediency and necessity of abolishing serfdom. There were few supporters of this idea in the state, because most landlords, on the contrary, expected the

subjection of peasants. As indicated in the decree, the Ministry was created "to manage state property, to take care of free ordinary people and to manage agriculture" (Complete collection of laws of the Russian Empire. Second meeting. Volume XII…, 1838). The new government body was supposed to introduce measures to encourage the improvement of agriculture, promote the development of agriculture and horticulture, commercial, manufacturing and apothecary plants, horticulture, and viticulture, sericulture, animal husbandry, sheep breeding, marine crafts, etc. The newly created Ministry on March 9, 1838, was subordinated to the Moscow Society of Agriculture, which was removed from the subordination of the Ministry of Internal Affairs and from which information was expected about experiments to improve agriculture conducted in various natural zones of the empire (Report of the Imperial Moscow Society of Agriculture for 1836 and 1837…, 1838). The Ministry of State Property consisted of three departments. The first and second were engaged in state property and free peasants. The management of agriculture was entrusted to a third department, which included a scientific committee to consider issues that required special knowledge. In addition, on May 28, 1841, under the leadership of the Ministry of State Property, the Inspectorate of agriculture of the southern provinces was established, whose powers extended to the Kherson, Tauride and Ekaterinoslav provinces, and the Caucasian and Bessarabian regions. The task of the new institute was to "spread and encourage improved agriculture in the southern provinces for agriculture and horticulture, for breeding commercial, manufacturing and apothecary plants, winemaking, sericulture, cattle breeding, and sheep breeding". A separate section of the regulations on inspection defined its responsibilities for managing educational and exemplary institutions (Art. 15–19) (Complete collection of laws of the Russian Empire. Second meeting. Volume XVI…, 1842).

The activities of the third Department covered many issues that were only indirectly related to agriculture. Only on January 21 (9), 1845, the third department of the Ministry of State Property was reorganised into a department of agriculture, its activities were aimed primarily at meeting the needs of this industry (Complete collection of laws of the Russian Empire. Second meeting. Volume XX…, 1846). The Department of Agriculture consisted of five subdivisions, each of which had a specific area of activity. In particular, the second subdivision dealt with the affairs of all educational and economic institutions subordinate to the Ministry of State Property, namely: 1) the management of Gory-Goretsky agricultural school with the property transferred to it; 2) the foundation and arrangement of educational farms; 3) the foundation and arrangement of exemplary estates; 4) the management of exemplary estates; 5) the management of garden institutions, schools of horticulture and winemaking; 6) the management of forest and boundary institutes; 7) the education of foresters and agronomists abroad (Complete collection of laws of the Russian Empire. Second meeting. Volume XX…, 1846). The legally regulated areas of activity of the Department of Agriculture reflected the acquisition of independent significance by the agricultural industry in national policy (Shulga *et al*., 2021).

During 1837–1856, the Ministry of State Property was headed by the count P.D. Kiselyov (1788–1872). A consistent opponent of serfdom, he reformed the management of the state village, introduced a land tax for state-owned peasants instead of a poll tax, and proposed the gradual liberation of peasants. Under his leadership, the Ministry of State Property became one of the most influential in the Russian Empire, although the reforms he carried out were ambiguously perceived in society. P.D. Kiselyov personally did a lot for the development of agricultural education. Although it was not without peasant riots, in particular, by the allocation of land for potato crops. After the death of Nicholas I, the influence of the Ministry on state affairs also significantly decreased. During 1857–1865, his policy underwent two transformations. Head of the Ministry in 1857–1862, M.M. Muravyov-Vilensky (1796–1866), being an opponent of the liberation of the peasants, actually sabotaged the policy of Alexander II (reign: 1855–1881) to prepare the peasant reform, which led to the resignation of the minister. General O.O. Zelena (1818–1880), appointed to this position in 1862, was instructed by the tsar to develop measures to reform the Ministry, which lost its former status because of the era of guardianship over state peasants was over. According to the decree of Alexander II of December 22, 1866 "On changing and reducing the composition of the Ministry of State Property and local institutions subject to it in the provinces", the functions of the Ministry were significantly reduced, and the management of state peasants was transferred to the Ministry of Internal

Affairs (Complete collection of laws of the Russian Empire. Second meeting. Volume XLI…, 1866). Together with the Ministry of State Property, the Department of Agriculture also changed. It was reorganised into the Department of Agriculture and rural industry, which reflected the recognition of agriculture as a separate industrial sector of the Russian economy. But in general, in the context of a significant reduction in funding and staff, the Ministry of State Property has lost its former political significance in the system of state power.

Over the following years, the government considered various concepts for reorganising the Ministry. Proposals were put forward, for example, to reorganise it into the Ministry of Trade and Economy. It was also proposed to create a Ministry of National Economy, which should be subordinate to industry and trade, while agriculture was planned to be transferred to the Ministry of Finance, which should manage "all sources of state income", as it was before 1837 (Voronov, 2013). In the end, the Ministry of State Property was retained as a government body under the same name. But during 1866-1894, its main task was to manage state property, while the management of agriculture did not form any significant part of its activities. For almost three decades, agriculture has fallen out of the sphere of state regulation.

In the post-reform period, agricultural production remained an unproductive and risky sector of the Ukrainian economy, the development of which was accompanied by numerous droughts, shortages, and famine. Higher agricultural education was perceived by officials as a minor, secondary thing. In the empire as of the beginning of the 1890s, only two agricultural Western military districts operated: The Novo-Alexandrian Institute of Agriculture and Forestry and the Petrovska Agricultural Academy. There were a lot of people in the country – and well-known natural scientists, and individual peasants devoted to the idea of developing agriculture and research. There were scientific organisations, agricultural societies, and country councils, experimental fields, stations, institutions, etc. The first state research institution was created - Poltava Research Field. But there was no balanced national policy for the development of agriculture and industry research, just as there was no relevant Ministry. Since the second half of the 19th century, communication between government structures and the agricultural population of provinces, including Ukrainian ones, was carried out by agricultural societies.

The first relevant government body is the Ministry of Agriculture and State Property – it was created by decree of Alexander III (reign: 1881–1894) of April 1 (March 21), 1894. One of the reasons for the foundation of this institution, historians call the famine of 1891–1892, which covered a significant part of the state with a population of 35 million people. Then more than 500 thousand people died from starvation and the cholera epidemic that accompanied it (Ulyanchenko *et al.,* 2020). Since the foundation of the new Ministry, the main place in its activities has been occupied by agricultural management, while the management of state property has faded into the background. A. Yermolev (1847–1917) was appointed head of the Ministry. A graduate of the St. Petersburg agricultural institute, he was the first head of the relevant Ministry with higher agricultural education and the author of research papers on agronomy. In 1892, A. Yermolev published a study "Crop failure and national disaster" (Yermolov, 1892), in which, in the section on cultural means of combating drought, it was proposed to create a Central Agronomic Committee within the Ministry of State Property as the highest body to which metrological and agronomic stations and experimental fields should report, and which would be responsible for "the interests of agriculture, ... united all the best forces in Russia from different branches of agronomic knowledge". As usual, due to financial difficulties, this project was not implemented; its provisions were partially considered in the process of reorganising the relevant Ministry in 1894. Within the reformed Ministry of Agriculture and State Property, the Department of Agriculture and the Scientific Committee underwent significant changes. At the initiative of one of the founders of modern soil science, director of the Department of Agriculture P.A. Kostichev (1845–1895), the government bought out several private research stations, which marked the beginning of the establishment of a network of state agricultural research institutions. The scientific committee was instructed to: consider issues related to the regulations and charters of branch educational institutions; discuss agricultural experiments and the arrangement of experimental stations, laboratories, fields; search for means against falsification of nutritious and feed products, seeds, fertilisers, etc. At the same time, special bureaus were created under the scientific committee as scientific and research institutions, which "were entrusted with discussing and developing all sorts of issues and measures

for the organisation and activities of research institutions in Russia" (Agricultural Scientific Committee..., 1919). Initially, there were five such bureaus – applied botany; entomology; zoology and zootechnics (all founded in 1894); agriculture and soil science (1895), and the bacteriological laboratory (1894 or 1895). Subsequently, bureaus were organised for meteorology (1896); agriculture (1897); industrial zoology and fisheries (1899); mycology and phytopathology; educational; agricultural mechanics (1907); crop production (1911) (Gins and Shafranov, 1914). In addition, a permanent commission on agricultural research was created under the Scientific Committee, which was headed by O.O. Schultz (1855-1922). Such a reorganisation meant a radical change in the functions of the Scientific Committee. From an institution with administrative and advisory functions, as it was from the very beginning of its existence, the Scientific Committee turned into a complex of research institutions, in which each scientific or research bureau was headed by a full member of the Scientific Committee in the relevant speciality. Modern historians (academician of the NAAS V. Vergunov (2019), academician of the Russian Academy of Sciences N. Goncharov (2012) proved that the creation of specialised bureaus was a key turn in the organisation of the system of state scientific support for the needs of the agricultural industry, which in Soviet times ended with the creation of a system of specialised institutes of the All-Union Academy of Agricultural Sciences named after Lenin. During 1895-1913, the number of permanent agricultural research institutions increased from 32 to 264, including experimental stations – from 10 to 77, experimental fields – from 13 to 125, etc. The number of agricultural educational institutions subordinate to the Department of Agriculture increased from 82 to 360, and the number of students who studied there – 4 thousand to 18 thousand people (Morachevsky, 1914). According to Professor V. Viner (1922), an outstanding organiser of the research business – "As in other European countries, in Russia, research institutions were created due to a private initiative, which later met with the support of the agricultural society and much later, from the mid-1990s – state support.

CONCLUSIONS

In the Ukrainian lands under the Russian control, the development of industry research as an integral part of natural science and organisation took place in the context of the transformation of the policy of the Imperial leadership for the development of agriculture from purely fiscal to the introduction of measures to ensure its progressive development. The development of a new economic paradigm in the context of the crisis of the feudal-serf system, the ridge of repeated shortages and famine led to an increase in the demand for natural sciences in general and, in particular, agricultural science to solve the socio-economic and political problems of the empire.

Experimentation with field crops based on the achievements of natural science was preceded by an experimental case related to the cultivation of gardens. Such experimentation prepared the creation of the Apothecary ordinance in 1581, which has become a national governing body in the second half of the 17th century. The Chamber college (est. 1717), as the Department of State Property within the Ministry of Internal Affairs and Finance (est. 1802), first of all, considered the management of state budget to be its main goal.

The organization of the Ministry of State Property in 1837 reflected the government policy of improving agriculture and increasing the profitability of the state village. However, only the creation of the Department of agriculture as part of the Ministry of State Property in 1845 directed the activities of officials towards ensuring the development of the agricultural industry. In the conditions of the post-reform empire, the Ministry of State Property lost its former significance in the public administration system, and the management of agriculture did not form a significant part of its activities. In fact, for three decades, agriculture has fallen out of the sphere of state regulation. The foundation of the first specialised Ministry of Agriculture and State Property in 1894 reflected the transformation of the state course on the development of agriculture – the management of this industry became the focus area of the Ministry, which directly affected the development of industry research, the guardianship of which passed to the newly created institution. As part of the reformed Ministry, changes were made to the Scientific Committee, which turned from an institution with administrative and advisory functions into a complex of research institutions.

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