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THE FIRST UKRAINIAN TEST ARTILLERY RANGE: BIRTH AND EARLY YEARS OF ACTIVITY (1931–1941)

Перший український випробувальний артилерійський полігон: створення і початок діяльності (1931–1941)

From the earliest days of Ukraine's independence, issues of military security became relevant, and in contemporary conditions, the problems of strengthening its defense capabilities have taken precedence. The experience of creating and operating the leading enterprises in Ukraine's defense industry over the last century can be instructive. One such enterprise is the Pavlograd Mechanical Plant (PMP), which includes a test range. Using selected theoretical and methodological tools, a historical reconstruction of the birth and the initial years of the Pavlograd Artillery Test Range has been conducted. Based on original sources, the primary tasks of the range were identified as conducting control tests of ammunition. The study revealed that during that time, there was no educational institution, whether civilian or military, that trained managers for ranges. Consequently, almost all range management personnel were military individuals who gained relevant experience through direct practical activities. The research covers some episodes of the lives of the first chiefs of the Pavlograd range. The pre-war period's activity of the range has been examined, and its effectiveness has been evaluated using two main indicators: the number of shots fired and the duration of testing one batch of a certain type of ammunition. In 1938, the Pavlograd Artillery Range attained the status of a branch for testing aviation ammunition. On the eve of World War II, it was found that the range generally met modern requirements and successfully tested ammunition. The Pavlograd Artillery Test Range, the first and only one in Ukraine in the 1930's, was proven to

be a powerful test base of the USSR. In terms of workload and efficiency, it significantly surpassed similar operational ranges of that time, such as Sofrinskii, Chapayevskii, and Uralskii.

Keywords: Pavlograd Mechanical Plant, artillery range, ammunition, test, World War II.

З перших днів незалежності України воєнна безпека набула актуальності, а в сучасних умовах на перший план вийшли й проблеми зміцнення обороноздатності. Досвід створення та діяльності провідних підприємств оборонної промисловості України ХХ ст. може стати в нагоді. Одним з таких підприємств став Павлоградський механічний завод із його випробувальним полігоном. За допомогою обраного теоретико-методологічного інструментарію було зроблено історичну реконструкцію народження та перших років діяльності Павлоградського артилерійського випробувального полігону. Спираючись на першоджерела, визначено основні завдання полігону — контрольні випробування боєприпасів. У дослідженні з'ясовано, що в той період не існувало жодного навчального закладу, цивільного чи військового, де готували б керівні кадри для полігонів, тому майже все керівництво полігону становили військові, які набиралися відповідного досвіду під час практичної діяльності. Висвітлено окремі епізоди життя і діяльності перших начальників Павлоградського випробувального полігону. Досліджено діяльність полігону в довоєнний період, оцінено його результативність за двома основними показниками: кількістю пострілів та тривалістю випробування однієї партії певного виду боєприпасів. Встановлено, що 1938 р. Павлоградський артилерійський полігон набув статусу галузевого з випробування авіаційних боєприпасів. З'ясовано, що напередодні Другої світової війни полігон загалом відповідав сучасним вимогам й успішно випробовував боєприпаси. Випробувальну базу Павлоградського полігону було значно зміцнено, зросли й обсяги випробувань, багато зроблено для випробування авіаційних виробів. Доведено, що Павлоградський артилерійський випробувальний полігон — перший і єдиний на теренах України у 1930-х рр., став потужною випробувальною базою СРСР, яка за обсягами робіт і ефективністю значно перевищувала аналогічні полігони того часу (Софрінський, Чапаєвський, Уральський).

Ключові слова: Павлоградський механічний завод, артилерійський полігон, випробування, боєприпаси, Друга світова війна.

Relevance of the research. With the attainment of Ukrainian independence, ensuring military security has become a pressing issue, and in contemporary conditions, strengthening defense capability has taken precedence. The experience gained from the creation and operation of leading defense industry enterprises

in Ukraine throughout the last century is invaluable, especially considering that some of these enterprises continue their activities to this day.

Specifically, the state enterprise «Production Association Yuzhnii Machine-Building Plant named after O. M. Makarov» (Pivdenmash) currently stands as a leading enterprise in Ukraine's rocket and space industry, under the jurisdiction of the State Space Agency. Among its structural subdivisions is the Pavlograd Mechanical Plant (Pavlohradskii Mekhanichnii Zavod — PMZ), which plays a prominent role. The primary activities of PMZ include «producing elements of rocket and space technology, agricultural machinery, testing and disposal of ammunition, as well as the manufacture of various types of civilian products»[1]. PMZ has achieved significant milestones, such as creating the country's most powerful solid-fuel engine with a thrust of 300 kgf, operating one of the largest fire stands in the industry, and establishing the only base in the country for conducting drop tests in ground conditions. The plant was responsible for the final assembly of all solid-fuel and liquid missiles with a mortar launch scheme, as well as constructing a strategic train — a combat railway missile complex (BZhRK — in Russian), unparalleled in any country worldwide.

The history of the plant is closely intertwined with the history of the state, reflecting changes in its domestic and foreign policies. Throughout its existence, the company has transitioned from being a test artillery range to producing solid propellant rockets and engines. The history of this enterprise can be divided into four periods, considering its main activities as the primary criterion for periodization:

1931–1960s — Artillery: Creation and operation of an artillery range where tests of artillery and aircraft ammunition and systems were conducted.

1960–1990 — Missile: Deployment of research work and research and development for the manufacture and testing of solid-propellant rocket engines for strategic purposes and ballistic missiles.

1991 — early 2000's — Conversion: Production of civil products, consumer goods, and elements of rocket and space technology.

2000's — Revival of research work and resumption of rocket and space activities[2].

As of now, modern historiography lacks scientific studies on the history of the Pavlograd Mechanical Plant across all stages of its activities. Several factors have contributed to this situation: 1) the plant's involvement in the country's military-industrial complex led to a high level of secrecy surrounding its activities; 2) production and reporting documentation was destroyed during the plant's evacuation (1931–1941 period), and collected departmental archives were marked

[1] Південмаш. Структурні підрозділи. URL: http://surl.li/omajm

[2] Павлоградському механічному заводу — 70 років. Короткі нариси з історії Павлоградського механічного заводу Виробничого об'єднання «ДП Південний машинобудівний завод імені О. М. Макарова» / упорядн. Льняний В. М. Дніпропетровськ: Пороги, 2001. 240 с.

as «top secret». The only exceptions are publications[1], which contain interesting facts without references to primary sources and have an informative and journalistic nature. Particularly unknown to the general public and unexplored is the first period of the PMP — artillery (1931–1960's).

The 1930's marked the second stage in the development of Soviet artillery: *«On May 22, 1929, the RMC (Revolutionary Military Council) of the USSR adopted the artillery armament system for 1929–1932 developed by the Main Artillery Directorate (MAD) of the WPRA (Workers'and Peasants' Red Army), which became an important program document for the development of this type of troops. The artillery armament system provided for the creation of anti-tank, battalion, regimental, divisional, corps artillery and reserve artillery of the Main Command»2*.

The history of artillery test ranges, which was generally understudied in the former USSR, also held a prominent position in this system. The Sofryn polygon is the only exception (Белов, А. И. 2009)[3].

Only Russian publications on the general history of artillery technology in the USSR provide fragmentary information about individual test ranges located in Russia. Artillery ranges in Ukraine were not separately studied by either Soviet (Russian) or Ukrainian researchers. Archival sources, which were found, played a crucial role in studying the history of the Pavlograd artillery range in the specified context[4]. The memories of test site employees, particularly the head of experiments, also contributed valuable insights[5]. An important historiographical source is the history of the Pavlograd Mechanical Plant. Some facts from this source were also useful in the process of studying the issue[6].

The *purpose of our study* is to conduct a historical reconstruction of the birth and operation of the Pavlograd Artillery Test Range — the first in Ukraine. The aim is to determine the main directions, objectives, and effectiveness of its activities, as well as to understand its importance in strengthening the country's defense capabilities.

[1] Павлоградському механічному заводу — 70 років. Короткі нариси з історії Павлоградського механічного заводу Виробничого об'єднання «ДП Південний машинобудівний завод імені О. М. Макарова» / упорядн. Льняний В. М. Дніпропетровськ: Пороги, 2001. 240 с.

[2] Развитие средств вооруженной борьбы в период между двумя мировыми войнами // Великая Отечественная война 1941–1945 годов. В 12 т. Т. 7. Экономика и оружие войны. Москва: Кучково поле, 2013. С. 359.

[3] Terra Incognita Подмосковья: «гулкая» история забытого района. URL: https://cutt.ly/OwDclEGD.

[4] Архив президента Российской Федерации(АП РФ). Ф. 3. Оп. 46. Д. 344. Л. 79–95; Российский государственный военный архив (РГВА). Ф. 4. Оп. 18. Д. 54. Л. 218–338; Центральный архив министерства оборони (ЦАМО). Ф. 33. Оп. 686043. Д. 7. Л. 154; ЦАМО. Ф. 33. Оп. 682525. Д. 43. Л. 302; Государственный архив Российской Федерации (ГА РФ). Ф. Р-8418. Оп. 28. Д. 30. Л. 13; Российский государственный архив экономики (РГАЭ). Ф. 8177. Оп. 1. Д. 66; РГАЕ. Ф. 8177. Оп. 1. Д. 116; ЦАМО. Ф. 81 (ГАУ). Оп. 12104. Д. 759. Л. 92–93; Российский государственный архив социально-политической истории (РГАСПИ). Ф. ГКО. Д. 7.

[5] Артиллерия — бог войны. Записки РО (руководителя опытов). 2003. URL: https://guns.allzip.org/topic/42/2.html

[6] Південмаш. Структурні підрозділи. URL: https://cutt.ly/UwDclO1b; Предприятия. № 6–10. URL: https://cutt.ly/dwDczhyo

To achieve this goal and utilize the available information sources, we established the *principles and methods of research*. The theoretical and methodological basis for reconstructing the history and activities of the Pavlograd Artillery Range was formed on general scientific principles such as objectivity, historicism, certainty, representativeness, etc. Adhering to the principle of historicism, we examined the activity of the artillery range in the city of Pavlograd in chronological order, considering it in relation to socio-political and socio-economic changes in society. The research addressed both positive and negative aspects, enabling an objective and unbiased assessment of the Pavlograd artillery range's activity in the specified period and determining its significance in enhancing the country's defense capability.

Reproducing the object of study against the backdrop of historical processes involved general scientific logical methods, including analysis and synthesis. The problem-chronological method was applied, allowing the identification of specific issues and their consideration in the chronological sequence of historical events. The combination of historical and logical methods helped determine the general patterns of the emergence and development of test ranges on the eve and at the beginning of the Second World War, highlighting specific features of the Pavlograd Artillery Test Range's activity.

From the late 19th century, the Rzhevskii range (founded in 1854 near St. Petersburg) served as the main artillery range of the Russian Empire and later the Soviet Union. This range conducted not only tests but also addressed various scientific problems related to artillery armament, testing new prototypes, and training artillery researchers. However, with the formation of the Soviet Union and the escalation of international political relations in the 1920's, the situation underwent a radical change. Decisions were made by the Soviet leadership at the IV and V All-Union Congresses of Soviets and at the XV Congress of the CPSU (B) (the All-Union Communist Party (Bolsheviks)) to create territorial test ranges. These ranges were intended to meet the need for testing ammunition produced in factories in the southern European part of the USSR, particularly in Ukraine*1*. (Ворошилов, К. Е. 1927). The eastern outskirts of Pavlograd were chosen as the location for the test range. It is a district center situated approximately 80 km from Dnipro. According to the «Encyclopedia of the History of Ukraine», Pavlograd is a city of regional significance in the Dnipropetrovsk region. It serves as the district center and is the focal point of the coal basin of the Western Donbass. Positioned between the rivers Samara (a tributary of the Dnipro) and Vovcha (a tributary of Samara), Pavlograd is 76 km from Dnipro (formerly known as Dnipropetrovsk). As of 2010, the population was reported to be 111.07 thousand people (Верменич, Я. 2011). The article further emphasizes that from its very founda-

[1] Развитие средств вооруженной борьбы в период между двумя мировыми войнами // Великая Отечественная война 1941–1945 годов. В 12 т. Т. 7. Экономика и оружие войны. Москва: Кучково поле, 2013. С. 359.

tion, Pavlograd became the center of the county army «…Pavlograd maintained its military orientation in the Soviet times. In 1934 an artillery range was established in the city» (Верменич, Я. 2011). The history of the Pavlograd Mechanical Plant (PMP) began with the artillery range, which was created not in 1934, but in 1931.

The location for the construction of the artillery range was approved by the relevant order of the Main Artillery Department of the Workers' and Peasants' Red Army dated 03.04.1931 under № К5/564/5453[1].

This decision was not accidental: Pavlograd is conveniently located at the intersection of highways and railways in the direction from north to south and a short distance from the regional centers of Dnipro — 75 km; Zaporizhzhia — 102 km; Donetsk — 194 km; Kharkiv — 197 km; Poltava — 215 km. All these facts ensured continuous fast delivery of the tested products to the test site.

On July 2, 1931 (the official date of birth of the Artillery Range), by order of the USSR Revolutionary Military Council, the construction of the Pavlograd Artillery Test Range for ammunition control tests began on the eastern outskirts of the Pavlograd farms. By the way, according to their purpose, military test ranges are divided into research (testing), training and factory ones. The Pavlograd Artillery Range became the first military test range in modern Ukraine. According to the approved plan, the Pavlograd Artillery Range had to conduct tests of ammunition produced at enterprises in Ukraine, southern Russia and the Caucasus.

It should be noted that in the 1930's there was an acute shortage of management staff to create regional artillery ranges. At that time, there was no educational institution, civilian or military, where specialists would be trained. Therefore, almost the entire management of the range consisted of the military, who gained relevant management experience in the process of direct activities at artillery ranges. In addition, in 1933, a staff of military representatives (military envoys) was introduced at the ranges to control by the army the quality of the products produced for the army. Mankov Khoma Mykolayovych, who was the commander of the regiment of the Workers' and Peasants' Red Army, a hero of the Civil War, and headed the department at the Rzhevskii research range, was appointed the first chief of the test range. Kh. M. Mankov put a lot of effort and energy into the construction of the range and the implementation of the ammunition test program, as evidenced by the results of 1931 — the range was equipped with modern for that period modernized weapons, including: 76-mm guns of the 1900–1902 model, 122-mm howitzers of the 1910 model, 107-mm field guns of the 1910 model, as well as 152-mm guns and howitzers of 120 and 200 pounds (Fig.1)[2]. A total of 7,500 shots were fired from various artillery weapons.

[1] Південмаш. Структурні підрозділи. URL: https://cutt.ly/UwDclO1b; Предприятия. № 6–10. URL: https://cutt.ly/dwDczhyo

[2] Павлоградському механічному заводу — 70 років. Короткі нариси з історії Павлоградського механічного заводу Виробничого об'єднання «ДП Південний машинобудівний завод імені О. М. Макарова» / упорядн. Льняний В. М. Дніпропетровськ: Пороги, 2001. С. 12.

Figure 1. Artillery weapon of the Pavlograd Test Range in the condition of the end of 1931:
1) 76-mm guns of the 1900– 1902 model,
2) 122-mm howitzers of the 1910 model,
3) 107-mm field guns of the 1910 model,
4) 152-mm guns and howitzers of 120 and 200 pounds (rom the: 1) 76 mm gun.

The 76-mm gun and 122-mm howitzer were pivotal Soviet artillery weapons that played a crucial role in the Second World War. Since these weapons underwent testing at the Pavlograd training ground, it is reasonable to assume that their objective assessment by foreign specialists indirectly characterizes the activity of the training ground itself. Notably, in the book by General Staff officer E. Middeldorf on the Eastern Front (Миддельдорф, Э. 2000), an assessment draws attention. Middeldorf, whose responsibilities included summarizing tactical experiences at the General Staff of the German Ground Forces, described the 76-mm gun with both negative and positive attributes. He acknowledged its inferior caliber compared to the 105-mm and 150-mm guns of Germany but highlighted its high mobility, providing excellent adaptability to local conditions (Миддельдорф, Э. 2000, с. 162). Furthermore, Middeldorf generally appraised the 122-mm howitzer positively. Concurrently, both Soviet and foreign experts acknowledge the superiority of German anti-aircraft artillery over its Soviet counterpart (Изонов, В. В. 2015; Миддельдорф, Э. 2000, с. 2000).[1]

Presently, examples of such weaponry are on display in various museums worldwide, with the largest collections found in museums in Finland (Suomenlinna Museum in Helsinki, Hämeenlinna Museum, Military Museum in Helsinki) and the Russian Federation (Artillery Museum, St. Petersburg; Technical Museum, Togliatti).

The next appointed head of the Pavlograd range was Kondrat Olexandrovych Grygorovych (1890–1965 (Figure 2))[2]. He was born in the village of Glavnykha, Chashkynskii district, Vitebsk region, Belarus. Grygorovych began his service in artillery in 1911 and joined the Red Army in the autumn. He fought in the First

[1] 76-мм гармати зразка 1900–1902 року. URL: http://surl.li/omakd;122-мм гаубиці зразка 1910 року. URL: http://surl.li/omakf; 107-мм польові гармати зразка 1907 року. URL: http://surl.li/omakj; 152-мм гармати. URL: http://surl.li/omako

[2] Південмаш. Структурні підрозділи. URL: https://cutt.ly/UwDclO1b; Предприятия. № 6–10. URL: https://cutt.ly/dwDczhyo

World War and the Civil War in 1918. K. O. Grygorovych served as the first Head of the Range Department of the USSR from 1934 to 1940, making a significant contribution to the creation and development of Soviet Union artillery ranges. Representing the colonel of the artillery technical service and the chief of the military base of the People's Commissariat of Defense (PCD) № 34, K. O. Grygorovych was awarded the Order of the «Red Banner of Labour». V. Ya. Tsybin, the Head of Ammunition Supply Department of the Main Artillery Directorate of the Red Army, emphasized: *«During the work as the Chief of one of the largest Central Artillery bases, he proved himself a large and competent leader and organizer. The base under his leadership is continuously improving its quality, the number of products and increases productivity. All tasks of the command about sending ammunition in the units of the current Red Army and the assembly of artillery shots are completed in a timely and high quality manner ... »1*. In another award letter he remarked: *«... with the arrival of K. Grygorovych, the work of the base has been improved, the implementation of Main Artillery Directorate operational tasks is provided in a timely and high quality manner. The economical equipment of base and household service of the personal has been improved significantly...»*[2].

Such personal qualities were inherent to Kondrat Alexandrovich throughout his life, regardless of the place of work or position. This is confirmed by the facts of his activities at the Pavlograd Artillery Range. In particular, in 1934, several constructions were built, including the laboratory (snaryazhatelnaya in Russian), barracks-type houses, barracks, the guard room, the fire station depot, and the canteen. Additionally, the construction of two residential multi-storey buildings had been initiated[3]. In the mid-1940's, K. O. Grygorovych was transferred to the apparatus of the People's Commissariat of Defense.

As the chief of the range, he was replaced by Vasyl Petrovych Serebryakov in 1934 (Figure 3).

Information about Vasyl Petrovych Serebryakov is limited and fragmented. It has been found that he came to the Pavlograd Artillery Range from the Sofrinskii Artillery Range near Moscow. With his direct participation, the history of the Sofrinskii range began: «In January 1933, a group of specialists led by the military engineer of the 1st rank Vasily Petrovich Serebryakov arrived in Putilovo, the first employees of the range: M. F. Timofeev, V. D. Ivaschenko, F. V. Kolimbet, N. A. Turayev, I. F. Bodrov, etc. They determined the place for the location of the future range»[4]. By the spring of 1934, the test track was ready, and on May 19, the first shot was fired from a 122-mm howitzer. This day was offi-

[1] ЦАМО. Ф. 33. Оп. 686043. Д. 7. Л. 154.
[2] ЦАМО. Ф. 33. Оп. 682525. Д. 43. Л. 302.
[3] Павлоградському механічному заводу — 70 років. Короткі нариси з історії Павлоградського механічного заводу Виробничого об'єднання «ДП Південний машинобудівний завод імені О. М. Макарова» / упорядн. Льняний В. М. Дніпропетровськ: Пороги, 2001. С. 14.
[4] Terra Incognita Подмосковья: «гулкая» история забытого района. URL: https://cutt.ly/OwDclEGD.

Figure 2. Grygorovych Kondrat Olexandrovych 1933–1934.

Figure 3. Serebryakov Vasyl Petrovych, 1934.

Figure 4. Ostapenko Mykola Trokhymovych 1934–1942.

cially remembered as the opening day for the Sofrinskii range, and Colonel V. P. Serebryakov was appointed its chief, «...who was destined to become a participant in five wars. For high heroism and courage manifested on the battlefields, he was awarded the Lenin's Order, two Orders of the Red Banner, the Order of the Red Star, and other medals and orders»[1]. This scant information was found on the Internet in the article[2], which has become almost the only source of information about the third chief of the Pavlograd Artillery Range.

In the autumn of 1934, Mykola Trokhymovych Ostapenko (Figure 4) was appointed to the position of the chief of the range, and he served in this capacity until 1942.

M. T. Ostapenko was an extraordinary person and a talented organizer. With considerable experience in military service and having previously headed ranges such as Sofrinskii and Chapayevskii, he played a leading role in the development of the Pavlograd range and the establishment of the range system throughout the country.

In the late 1930's, the USSR Administration of Ranges functioned, overseeing three operational ranges (Pavlogradskii, 1931; Sofrinskii, 1933; and Chapayevskii, 1934) and one under construction (Uralskii)[3].

The development of the ammunition industry necessitated specific tests, and only ranges with certain advantages — such as the greatest length, unique guns, exceptional testing facilities — were capable of conducting such tests. Consequently, the relevant range changed its status from regional to industrial and specific. In particular, in 1938, the Pavlograd test artillery range became a branch test site specifically designated for the testing of aviation ammunition[4].

[1] Terra Incognita Подмосковья: «гулкая» история забытого района. URL: https://cutt.ly/OwDclEGD.
[2] Terra Incognita Подмосковья: «гулкая» история забытого района. URL: https://cutt.ly/OwDclEGD.
[3] РГАЭ. Ф. 8177. Оп. 1. Д. 116. Л. 1.
[4] Павлоградському механічному заводу — 70 років. Короткі нариси з історії Павлоградського механічного заводу Виробничого об'єднання «ДП Південний машинобудівний завод імені О. М. Макарова» / упорядн. Льняний В. М. Дніпропетровськ: Пороги, 2001. С. 17.

The primary task for all ranges was to conduct inspections of ammunition tests, and their performance was assessed by the number of shots fired and the duration of testing for one batch of certain ammunition. In 1938, the most crucial task for the ranges was to increase their capacity to 300,000 shots per year in one shift, with the testing of one batch of ammunition not taking more than 4 days. As evidenced by the memorandum to the annual report of the People's Commissariat of Defense Industry (PCDI) Bureau on equipment in 1938, this task was successfully completed[1], and the information on the implementation of the plan by individual ranges in terms of capacity and the tests can be traced according to Table. 1.

Table 1

Implementation of the test plan at existing ranges in the USSR in 19382

Ranges	Plan		Implementation		Specific weight of the ranges in percent
	in shots	specific weight of the range in percent	in shots	specific weight of the range in percent	
Sofrinskii	120 694	55,8	186 707	154,2	58,6
Pavlogradskii	**48 576**	**22,2**	**58 954**	**123,3**	**18,5**
Chapayevskii	49 105	22,0	72 887	148,2	22,9
Total:	**218 375**	**100**	**318 548**	**140,6**	**100**

Regarding the average duration of tests for one batch of ammunition, in 1937 it was 4.9 days. The Administration of the Bureau set a priority task for the following year, aiming to decrease the average duration of tests in 1938 to 4 days. Various items, such as batches of shell casings, shell casings, projectiles in equipment, detonators, means of ignition, various systems, and aircraft products, were tested. This plan was successfully implemented, as indicated by the report notes' materials. The average duration of testing on ranges in 1938 was distributed as follows: Sofrinskii — 4.0 days; Pavlogradskii — 3.5 days; Chapayevskii — 3.4 days. Overall, for the period between 1936 and 1938, a positive trend was observed in the activity of all ranges: 1938 — 4.0 days; 1937 — 4.9 days; 1936 — 7.0 days[3].

Tests of air bombs and detonators in 1938 and in the first half of 1939 (Table 2) were carried out by Sofrinskii and Pavlogradskii ranges.

Table 2

Dynamics of work volume growth on air tests in 1938–19394

Ranges	Droppings			Implementation in percent	
	according to the report for 1938	plan for1939	according to the report for 1939	Before the report for 1938	Before the plan for 1939
Sofrinskii	6557	3429	4544	69,3	132,5
Pavlogradskii	**4331**	**10 500**	**15 695**	**362,5**	**146,7**
Total:	**10 888**	**13 929**	**20 239**	**186,0**	**145,3**

[1] РГАЭ. Ф. 8177. Оп. 1, Д. 66.
[2] РГАЭ. Ф. 8177. Оп. 1. Д. 66. Л. 2.
[3] РГАЭ. Ф. 8177. Оп. 1. Д. 66. Л. 3.
[4] РГАЭ. Ф. 8177. Оп. 1. Д. 116. Л. 4.

As we can see, the rate of plan implementation for the Pavlograd Artillery Range, compared to the previous year, is 362.5%, and the implementation rate plan for the current year is 146.7%. Despite the obvious overfulfillment of the volume plan for the work performed, the indicators of the average duration of the test for one batch of ammunition remained at the levels of 1938: Sofrino — 4.1 days, Pavlograd — 7.2 days. An explanation for this fact can be found in the explanatory note: «lack of necessary weather in the autumn-winter months, delays in sending documentation for products sent for testing from the military on the factories, lack of material parts, and late receiving of fuel and lubricants, as well as ammunition»*1*. All the reasons mentioned were subjective, so the reported indicators for the duration of tests under normal operating conditions could have been significantly reduced.

In 1939, the task for testing artillery products was set at 397,324 shots, an increase of 78,776 shots over the actual implementation in 1938, or 24.7% growth to 1939. In reality, in 1939, all ranges fired 413,719 shots, reaching 104.1% of the target and showing a growth compared to 1938 by 29.8%. Despite the increase in the volume of tasks, the ranges consistently overfulfilled their annual goals due to repeated tests and various unscheduled works[2]. Information on the implementation of the plan tests in 1939 by individual ranges are placed in Table 3.

Table 3

Implementation of the test plan at existing ranges in 19393

Ranges	Plan		Implementation	
	In shots	Specific weight of the range in percent	In shots	Specific weight of the range in percent
Sofrinskii	169 915	42,7	179 671	43,4
Pavlogradskii	**107 031**	**27,0**	**121 836**	**29,5**
Chapayevskii	117 095	29,5	110 974	26,8
Uralskii*	3283	0,8	1238	0,3
Total:	**397 324**	**100**	**413 719**	**100**
*Uralskii artillery range was opened on October 1, 1939				

Despite the implementation of the planned volumes of tests, the duration of tests set by ranges for 1939 in 4 days was not performed. So, the duration of the tests was distributed on average among the ranges as follows: in Sofrinskii — 4.3 days; in Pavlogradskii — 5.4 days; in Chapayevskii — 4.41 days; in Uralskii — 3.3 days, i.e. an average for all ranges — 4.35 days. Increasing the duration of the tests in the current year was mainly due to internal reasons. In particular, insufficient width of the field of the Pavlograd artillery range negatively affected the implementation of the program in 1939, which led to the extension of product testing periods[4].

[1] РГАЭ. Ф. 8177. Оп. 1. Д. 116. Л. 17.
[2] РГАЭ. Ф. 8177. Оп. 1. Д. 116. Л. 1.
[3] РГАЭ. Ф. 8177. Оп. 1. Д. 116. Л. 2.
[4] РГАЭ. Ф. 8177. Оп. 1. Д. 116. Л. 3–4

The last problem was relevant not only for the Pavlograd landfill. Back in 1937, the newly appointed Chief of Artillery of the Red Army, M. Voronov, at the meeting of the Military Council under the People's Commissariat of Defense of the USSR, drew attention to the fact that «artillery ranges are very neglected, and the lands of many ranges are occupied by ancillary farms». He also emphasized that «new systems of material artillery have a higher initial rate of fire, so the firing ranges at the ranges must be increased... The range's departure fields must be expanded»[1]. But, as the example of the Pavlograd landfill shows, this problem had not been solved even two years after that speech.

Along with the increase in the volume of ammunition testing, the material and technical base of the Pavlograd range was also strengthened. The range included the following units: a workshop for the preparation of guns for testing, a workshop for ammunition training, a shooting workshop (a field), a repair and mechanical workshop, a repair and construction workshop, an artillery testing department (conducting shooting tests and reporting), a department of aviation ammunition testing, a ballistic laboratory, an operational and production department, and others[2].

But the orders of the People's Commissariat of Defense (PCD) exceeded the possibilities of even such an equipped range as Pavlogradskii, because the outdated problems of four years ago regarding the equipment of the landfill remained relevant. In particular, in 1940, the People's Commissariat of Ammunition thwarted the order of NKO on 76-mm armor-piercing shots. In the letter to the chairman of the USSR Defense Committee K. Ye. Voroshylov, his deputy Marshal G. I. Kulyk, among other reasons indicates the following: «At the Pavlograd range, there is no equipped shooting range for tests of armor-piercing projectiles; the test is carried out only on equipment quality, and all other shootings stop as fragments are flying all over the range»*3*. And then, emphasizing the importance and urgency of resolving this issue, asks to commit People's Commissar for Ammunition: «2. Without ceasing the test for the 76-mm equipment armor-piercing projectiles at the Pavlograd range, do proceed immediately to the construction of a special shooting range there for testing hulls on durability on armor plates. — Complete preparation of the shooting range for testing has to be completed no later than March 25 this year»*4*.

In general, the analysis of the state of production of artillery ammunition in 1940 showed *«that this most important branch of military production is still in an extremely disorganized state and does not ensure the defense of the country»5*.

[1] РГВА. Ф. 4.Оп. 18. Д. 54. Л. 218–338.

[2] Павлоградському механічному заводу — 70 років. Короткі нариси з історії Павлоградського механічного заводу Виробничого об'єднання «ДП Південний машинобудівний завод імені О. М. Макарова» / упорядн. Льняний В. М. Дніпропетровськ: Пороги, 2001. С. 14.

[3] ЦАМО, f. 81 (GAU), op. 12104, spr. 759, pp. 92–93.

[4] ЦАМО. Ф. 81 (ГАУ). Оп. 12104. Д. 759. С. 92–93.

[5] АП РФ. Ф. 3. Оп. 46. Д. 344. С. 79–95.

On the eve of the war, artillery ranges where control tests were conducted, were mostly under the authority of the People's Commissariat of Ammunition (PCA). *«In December 1940, according to the results of tests at the Pavlograd training ground, 13 batches of 203 mm projectiles manufactured by various factories were rejected out of 15 tested; before and after this, similar cases with these shells have never been observed. In the summer of 1940, the same training ground and the Sofrinskii training ground tested projectiles for accuracy with damaged panoramas»1. As mentioned in the report, these consequences were preceded by several reasons that distorted the actual test results. The most important among them are: «the lack of management of the work of these landfills by the PCA, lack of qualified personnel, lack of clear organization of work and discipline, as well as interest of the PCA as a supplier»2. The situation improved after all the test sites were militarized and transferred to the Main Artillery Directorate of the Red Army.*

With the outbreak of World War II, tests at the range continued until August 18, 1941, when, in accordance with a resolution of the State Defense Committee № 510, the Pavlograd range was evacuated to the artillery range in Novosibirsk. There, its activities were partially resumed, and the material part was partially transferred to the People's Commissariat of Defense (PCD)3.

The most famous training ground in Germany at that time was the training ground in Kummersdorf, near Berlin. Studying the historiographical sources[4] (Изонов, В. В. 2015; Миддельдорф, Э. 2000) allows us to generalize the functional capabilities of the specified landfill and compare them with Pavlogradskii. The artillery range in Kummersdorf, created back in 1875, at the beginning of the 1930s had quite significant differences compared to Pavlograd. It was located on a much larger area. It included several test complexes with different functions and two artillery ranges. One of them («Zachid» shooting range) was intended for testing smaller caliber guns. It was about 7.5 km long. The second («Skhid» shooting range) is for testing guns of a larger caliber, about 13 km long. In the early 1930's, the Wehrmacht Army Research Center was established at the training ground. The main task of this center was the development of rocket technologies. The nomenclature of equipment and ammunition for the tests being tested has expanded significantly.

In the 1930's, the training ground in Kummersdorf turned into a large research and testing center, where all stages of preparing military equipment for general purposes were worked out: its research, development, and testing. The base created in Kummersdorf made it possible to test weapons samples and military equip-

[1] АП РФ. Ф. 3. Оп. 46. Д. 344. С. 79–95.

[2] АП РФ. Ф. 3. Оп. 46. Д. 344. С. 79–95.

[3] RGASPI. Ф. ГКО. Д. 7. Л. 82–83 (11012). Постановление ГКО СССР № 510 СС. Об эвакуации заводов Наркомата боеприпасов № 9 и № 53 (г. Шостка), № 55 (г. Павлоград) и Павлоградского полигона, с приложением записки Шверника Н. М. Молотову В. М.

[4] Heeresversuchsstelle-Kummersdorf-Museum. URL: https://1ll.ink/5OfmS; Test site. URL: https://1ll.ink/SPOTL

ment of all types. Artillery weapons, tank equipment, armored vehicles, rocket equipment, ammunition (shells, mines, bombs), transport equipment were tested here. Therefore, the Kummersdorf training ground surpassed any training ground in the USSR in terms of its functionality, including the Pavlograd training ground.

Conclusions. With the help of the chosen theoretical and methodological tools, the historical reconstruction of the birth and the first years of activity of the Pavlograd Artillery Test Range were carried out. Based on the primary sources, it was found out that the main tasks of the range were conducting control tests of ammunition; it was evaluated the effectiveness of the activity due to the number of shots and the duration of testing one batch of a particular ammunition. It was studied out that on the eve of World War II, the training ground generally met the requirements of that time and performed planned tests of ammunition on time. Thanks to the found archival documents, negative trends in the organization of the production of artillery ammunition and the activity of the testing grounds, in particular Pavlogradskii, were revealed in the specified period. The test base of the Pavlograd range was strengthened, the volume of tests increased, and significant work on testing aviation products was carried out. However, the activity of the artillery range in Pavlograd was negatively affected by the lack of a special shooting range for testing armor-piercing projectiles. In the course of the study, the authors proved that the Pavlograd Artillery Test Range was the first and only in Ukraine in the 1930s; it became a powerful test base of the USSR, which in terms of volume of work and efficiency significantly exceeded similar operating ranges of that time (Sofrinskii, Chapayevskii, Uralskii). This article does not pretend to be exhaustive of the raised problem, which requires more in-depth and extensive research related to the history of the Pavlograd Mechanical Plant and the Pavlograd Artillery Range, as well as the fate of each individual associated with the activities of this enterprise. Until today, for various objective and subjective reasons, this topic, unfortunately, is «closed», because first and foremost there is no access to archives and other primary sources, and only a small part of digitized archival materials can be found on the Internet.

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НАУКОВО-ПЕДАГОГІЧНА ТА ВИДАВНИЧА ДІЯЛЬНІСТЬ ІСТОРИКІВ УКРАЇНСЬКОГО ВІЛЬНОГО УНІВЕРСИТЕТУ В ПРАЗІ ПІД ЧАС ДРУГОЇ СВІТОВОЇ ВІЙНИ (1939–1945)

Scientific, Pedagogical, and Publishing Activities of Historians at the Ukrainian Free University in Prague during the Second World War (1939–1945)

У статті проаналізовано науково-педагогічну та видавничу діяльність істориків Українського вільного університету в Празі періоду Другої світової війни. Розкрито напрями та зміст наукової роботи викладачів і дисертантів УВУ, тематику навчальних курсів історичних дисциплін та їх актуальність у зазначений період. Виявлено та оцінено внесок наукової й видавничої діяльності цього навчального закладу для популяризації української історії та культури в умовах війни, що проявлявся в виданні наукових праць викладачів та докторантів, продовженні науково-дослідної роботи.