

Oil Fires of the First World War: Military Use and Destruction of Galicia's Fuel Industry* **

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During the First World War, the Russian army was faced with the task of developing areas captured from the adversary and sought to integrate the new territorial acquisitions into the Russian economy while simultaneously adapting them for effective warfare. At the time of its occupation by the Russian troops, Austrian Galicia already existed as a fully-formed industrial landscape dominated by private and state-controlled oil fields and refineries. The environmental situation in Galicia had remained extremely problematic over several decades preceding the First World War due to intensive oil extraction and manufacturing of petroleum products. The Russian administration which largely ignored the environmental issues (or, rather, exacerbated them) attempted to resume oil mining in Galicia and organize the production and distribution of petrol, kerosene, and fuel oil to supply the urban centers as well as the army and railways. However, the 1915 Gorlice – Tarnów offensive by the German army prevented Russia from taking full advantage of the Galician oil production capacities and prompted the Russian commandment to apply the scorched earth tactic. Special military units were ordered to destroy most drilling rigs, oil reservoirs, and refineries around Boryslav and Drohobych. Official reports and testimonies by eyewitnesses provide a striking picture of demolition on a vast territory to the west and southwest of Lviv. The documentary and historiographical sources lack consensus as to the actual number of facilities destroyed and the overall damage caused to the country's economy during the retreat of the Russian troops in April–May 1915. This study aims, firstly, to identify the key features of these events, and secondly, to explore the development of the Galician combat landscape, whose elements morph into “combat formations”, equally fit for productive activity and total (self-)destruction during warfare.

Keywords: First World War, Galicia, oil, combat landscape, environment

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В годы Первой мировой войны русская армия столкнулась с проблемой освоения занятых у противника территорий. Военные не только решали вопросы их интеграции в экономику Российской империи, но и приспособивали занятые прифронтовые земли для ведения боевых действий. В некоторых частях австрийской Галиции к моменту занятия ее русскими войсками сформировался индустриальный ландшафт, главным элементом которого выступали частные и казенные нефтяные месторождения и нефтеперерабатывающие заводы. Экологическая обстановка в Галиции на протяжении нескольких предвоенных десятилетий оставалась весьма напряженной из-за наносивших большой урон окружающей среде интенсивной нефтедобычи и производства нефтепродуктов. Не обращая особого внимания на эту проблему и скорее усугубляя ее, русская администрация в Галиции попыталась наладить добычу нефти, производство и распределение бензина, керосина и мазута для городов, войск и железных дорог. Однако наступление германских войск в ходе Горлицкой операции 1915 г. заставило русское командование применить при отступлении тактику выжженной земли. Специальные воинские команды должны были уничтожить в окрестностях Борислава и Дрогобыча большую часть буровых вышек, нефтяных резервуаров и перерабатывающих заводов. В источниках и историографии отразились разные мнения относительно количества уничтоженных объектов нефтепромышленности и ущерба, нанесенного краю вследствие намеренного разрушения его экономики в ходе отступления в апреле-мае 1915 г. Автор статьи выявляет особенности вышеперечисленных сюжетов и формирование «военного ландшафта», основной характеристикой которого оказывается превращение в «военный объект», готовый как к продуктивной деятельности, так и к тотальному уничтожению в ходе боевых действий.

Ключевые слова: Первая мировая война, Галиция, нефть, военный ландшафт, окружающая среда

A time of grandiose battles and profound economic transformations in the combatant blocs, the First World War was also a period when new practices of environment, landscape, and nature management came into being [Landscapes of the First World War]. This is particularly true of the occupied countries whose valuable resources were heavily exploited by enemy states.

Predictably, the utilization of natural wealth was accompanied, firstly, by a mental appropriation of the new lands, which were now construed as dependent territories, protectorates, or rightful constituents of bigger empires, and, secondly, by adopting an economic management system and governance arrangements which the occupation authorities might perceive as acceptable and customary. This scenario materialized, among others, in Galicia and Bukovina, two regions of the Austro-Hungarian Empire which, albeit incompletely and temporarily, remained under the control of the Russian army and military administration in 1914–1917 [Бахтурина; Ba-

гановский]. Given that Galicia had been part and parcel of the cultural, political, and economic life of Austro-Hungary, the region occupied an established position in the Austro-Hungarian collective worldview [Wolff]; however, after Russia took control of Galicia, some mental image of the territory as a province within the Russian Empire had to be fashioned.

It is therefore hardly surprising that the areas of Austro-Hungary “occupied by the law of war” (a term used in Russian official documents [РГВИА. Ф. 2003. Оп. 1. Д. 1643. Л. 53]) attracted the close attentions of civil and military experts, public figures, and journalists in Russia [Пашаева, с. 323–324]. Apart from the ethnocultural and religious problems, the economic development of Galicia and Bukovina featured prominently on the agenda. Fairly soon, scientific and industrial reviews of Galician forestry [Гомилевский], oil deposits [Истомин], and mineral wealth [Ферсман] were undertaken; research works by Polish authors were translated into Russian [Горнопромышленная карта Галиции]; reports on the country’s economy, ethnography, and geography were published [Танфильев; Ястребов], and an in-depth study of the transport infrastructure in Galicia and Bukovina was carried out [Яснопольский].

These activities were frequently initiated and supported by Russian administrators entrusted with the management of the newly-annexed lands. The officials were especially interested in the local resources of military significance that had to be explored and adapted to meet the needs of the Russian occupation authorities and army as soon as possible. One such crucial resource was oil, which was used to produce fuel and lubricants (F&L) for a variety of purposes, including railway transportation, lighting, and heating of military and civil facilities.

The case of Galician oil deposits is of particular research interest as it provides a valuable source of data, firstly, on the exploitation of the occupied provinces and the overall integration of Galicia in the life of the Russian Empire and, secondly, on the emergence of the Galician combat landscape, whose elements morph into “combat formations” (Gefechtsdinge) [Lewin], equally fit for productive activity and total (self-)destruction in the course of warfare.

This policy towards residential and industrial structures in the frontline areas became widespread in the summer of 1915. As the scope and protracted duration of the war had become clear by that time point, the Russian command initiated the construction of an extensive network of deep fortification lines. On the other hand, the not-one-step-back principle was eventually rejected, and the retreating Russian army devastated the Russian lands even worse than the occupied territories in an attempt to weaken the enemy [Нелипович, с. 376].

The Galician oil industry before the First World War

The industrial mining of oil in Galicia started in the second half of the nineteenth century [Frank, 2005]. Shortly before the First World War, the Galician oil production sector displayed a marked trend toward

concentration: “in 1910, 9 major oil producing companies (2.6 % of all enterprises) delivered about 900,000 tons of oil per year (56.1 %); 21 companies (6.2 %) extracted 300,000 tons (18.7 %), and 311 enterprises (91.2 %) pumped a total of 405,000 tons (25.2 %)” [Хонігсман, с. 142]¹. The oil industry was mainly confined to three locations: Jasło region in Western Galicia (Nowy Sącz, Gorlice, Jasło, Krosno, and Sanok); Drohobych region to the south-west of Lviv (Lisko and Khyriv), and Stanislawow region (Stanislawow, Nadwirna, and Kolomea). Drohobych region, and particularly the Boryslav–Tustanowice area, became Galicia’s main oil-producing center, responsible for up to 90 % of Galician oil [История, с. 2]. A large state-controlled oil refinery built in Drohobych in 1912 with its new spacious storage plants (to supplement the already available underground petroleum tanks in Kolpiec and Modrychi) was capable of processing 400,000–500,000 tons of oil per year.

For a long time, the extraction and processing of oil and ozokerite (mineral wax) relied on primitive technologies, resulting in serious environmental pollution. In the middle of the nineteenth century, landowners used to dig wells and raised oil to the surface with buckets; the wells were deepened with shovels or explosives. With the arrival of large oil-producing companies, oil drilling came to predominate, although the ancient bucket method of extraction persisted into the 1890s [Franaszek, p. 42]. The improved drilling process (known as the Canadian technology) made it possible to reach oil-bearing formations lying at a depth of up to 1 km. In part, the emergence of technological innovations in Galicia was due to the entry of Western European and American companies into the oil market. In 1912, investments in the oil industry reached 310 million Austrian crowns, 14.5 % of which was contributed by German banks and companies, 24.2 and 12.9 % by their British and French counterparts, with American and Belgian investments accounting for 2.5 and 1.3 %, respectively. Foreign nationals often served as board members of joint-stock companies in Lviv and Drohobych; Western Europeans were invited to work as managers and engineers at oil fields [Хонігсман, с. 60 и сл.].

The walls of oil boreholes often collapsed; another recurrent risk was the flooding of the wells by ground waters, which sometimes put oil mining to a complete standstill [Franaszek, p. 45]. In 1911, for instance, a rupture of underground formations resulted in “a catastrophic flooding of the wells in Tustanowice” [Лавский, 1927а, с. 116], causing a heavy loss of revenue for oil producers and considerable harm to the environment, primarily to arable lands, ground waters, and surface water bodies, which were covered in oil film [Frank, 2011, p. 178–179]. Fires resulting from imperfect equipment, staff negligence, or natural disasters (e.g. lightning strikes) were seen by oil company owners as an equally significant source of damage. In 1908, it took several months to extinguish the fire in the Oil City well (Tustanowice),

¹ All quotations from the Russian, Ukrainian and Polish sources have been translated by the author of this article.

which had yielded a stunning 2,500 tons of oil per day before the catastrophe [Franaszek, p. 50]. The authorities issued decrees and imposed safety rules on oil and gas producers; the new regulations, however, were frequently violated [Коритко, с. 285; Franaszek et al., p. 227].

Unsurprisingly, workers employed at drilling rigs, ozokerite mines, or oil refineries were affected by risks associated with fires, uncontrolled oil and gas blowouts, and a lack of proper methods of hazardous waste management. The hardships experienced by workers are vividly depicted in stories and novellas by Ivan Franko (1856–1916). In his description of an ozokerite plant (where, according to [Лавский, 1927а, с. 117], the labor conditions were even more precarious than at the oil fields), Franko mentions that the workers' "eyes... were bloodshot; their burnt faces were crimson from the blazing furnaces"; "the ozokerite carriers seemed to be completely covered with evil-smelling tar" [Франко, с. 309]. Outside of their dangerous workspaces filled with noxious gases, the workers faced an equally unsafe living environment; as Galicia's Governor Michael Bobrzynski confessed, "crude oil spills into the Tysmenytsia and spreads many miles down the river, already polluted by refuse and wastewaters from oil processing plants"; the untreated water was carried "onto the fields by regular floods" (cited in: [Frank, 2011, p. 178]).

The Russian army in Galician oil-bearing regions

The depictions of occupied Galicia in Russian sources were no less dramatic and expressive than the portrayals created by Galician authors. A. N. Tolstoy, who visited Galicia soon after its takeover by the Russian troops in 1914, left the following picture of Boryslav surrendered by the Austrian army:

Perched at the foot and on the slopes of the Carpathians is the dirty, black Boryslav. The square wooden oil rigs are bristling out obelisk-like everywhere you can find a free patch of space... Oil covers the bottom of the wide but shallowed river with charred-looking piles sticking out of the water; oil mingles with the deep layer of mud in the streets and the rotten wooden pavements; the discolored walls of the low houses, the doors hanging on one hinge, the broken panes of the crooked windows are all splashed with oil and dirt; wading through the mud and oil along those shabby single-story huts is a thick, equally black and dirty crowd [Толстой, с. 219].

During the 1914 offensive, the Russian army would use abandoned industrial plants for accommodation. The arrival of the Russian troops was sometimes accompanied by the devastation of factory offices and oil worker houses; such was the fate suffered by the Drohobych Refinery [Отчет представителя Министерства торговли и промышленности, с. 6] although its production machinery remained practically intact. Before leaving Drohobych, the Austrians, according to Russian engineers, managed to dismount only part of the production equipment

at the state-controlled refinery, leaving all the machines at the privately owned plants behind.

Given the high demand for F&L, the capture of Drohobych, Boryslav, and other oil production centers was highly relevant to the subsequent operations at the South-Western Front. In September – October 1914, the Drohobych Refinery was manned by just 30 workers, headed by senior technologist Drozdovsky. The military administration appointed Drozdovsky head manager; he was expected “to supply the troops with petrol and kerosene from the plant stocks as well as to sell kerosene in small amounts and use the revenues to pay minimum wages to the remaining workers” [Там же, с. 6]. It was only after the frontline shifted away from the oil-rich areas in late November – early December 1914 that the new administration of the Drohobych Refinery (headed by a representative of the Mining Department at the Ministry of Commerce and Industry G. F. Markovsky, who was later replaced by A. S. Ostrogradsky) was finally able to start planning regular operations.

Because the Drohobych Refinery still had at its disposal the largest stocks of oil and petroleum products in the region, it became the principal F&L storage and distribution center for Lviv and other cities taken over by the Russian troops as well as for the military formations at the front and in the rear [РГВИА. Ф. 13216. Оп. 1. Д. 95. Л. 3, 4, 10]. These functions appear to have been performed in disregard of earlier safety regulations, leading to uncontrolled spills of petroleum products. In winter months, Ostrogradsky reported, the principal task was “to organize uninterrupted transportation of fuel oil from Kolpiec to Drohobych via the pipeline, then load it into tank wagons”; however, “the fuel oil in winter months was a thick viscous mass which had to be constantly heated and pushed through the pipeline for 6 versts [6,4 km] under the pressure of up to 120 atmospheres. Pipeline blockages and ruptures commonly occurred...” [Отчет представителя Министерства торговли и промышленности, с. 8].

The Drohobych Refinery itself was in dire need of repair: the experts inspecting the plant pointed out machinery fatigue resulting from several years of “reckless exploitation”; moreover, to make operations possible, workers that had fled from Drohobych (or been conscripted to the Austro-Hungarian army [Лавский, 1927b, с. 269]) had to be returned to the plant, new engineers and mechanics had to be brought from Russia, and crude oil transportation from the oil fields had to be resumed. In February 1915, Ostrogradsky, pointing at the depletion of F&L stocks in the reservoirs, planned to initiate commissioning and adjustment works in March (part of the works had already been performed by K. Neuman’s team [Отчет представителя Министерства торговли и промышленности, с. 19–20]) so that the refinery could process 300 tank wagons of oil in April [РГИА. Ф. 23. Оп. 1. Д. 376. Л. 2].

Galician companies attracted the interest of Russian business: in February 1915, I. N. Ter-Akopov’s Varinskyye Techno-Chemical Plants (Nizhny Novgorod) inquired whether it was feasible to initiate “an exchange in solid

petroleum products” [РГВИА. Ф. 2005. Оп. 1. Д. 12. Л. 257]. The Triple Entente also insisted that several nationals of its member states return to their service on the boards of Galician private oil mining companies: in late 1914, the French embassy requested an entry permit to the frontline area for the French “director of an Austrian oil-producing company”, who intended to “inspect the oil reserves developed by that company” [Там же. Л. 260]. The Russian Foreign Affairs Minister S. D. Sazonov received similar requests from the British and Belgian ambassadors [Хонігсман, с. 222].

Oil well destruction during the 1915 retreat

The reports by Military Governor-General G. A. Bobrinsky and representative of the Ministry of Commerce and Industry A. S. Ostrogradsky appear to suggest that except for the repairs and launch of the Drohobych Refinery, no attempts to restart oil production and processing were undertaken until the Russian retreat from Galicia in 1915. However, even this activity was rendered useless and finally terminated on 28 April 1915, the next day after the military governor-general of Galicia received the order for the army to retreat in view of the successful German offensive at Gorlice and to destroy any property which might be of use for the enemy [Отчет представителя Министерства торговли и промышленности, с. 9].

According to military historian I. I. Rostunov, “the Gorlice operation was the first instance when the Russian commandment undertook mass destruction of key facilities and assets on the route of the Austro-German troops”. As Major General I. V. Pavsky (Head of Military Transport at the South-Western Front) wrote in his telegrams to General N. I. Ivanov, Commander-in-Chief of the Russian armies on the South-Western Front, “in all the areas, quartermaster freights have been removed, the bridges demolished, the railway tracks destroyed, the railway station facilities burnt, and the engines and carriages driven away. The sick and wounded have been evacuated. The property that could not be removed has been destroyed on site” [История Первой мировой войны, с. 35–36].

A. A. Brusilov, Commander of the 8th Army, suggested that before retreating from Drohobych “components of the machines must be removed from the state-controlled refinery; hard-to-detect damage must be caused to the equipment; minor wreckage must also be done to the machinery at private refineries to delay their operations by one month; the oil stocks and drilling rigs must be destroyed” [Горлицкая операция, с. 366]. N. I. Ivanov agreed that “the machinery at governmental and privately-owned refineries must be dismantled, and the mechanisms, as well as anything else transportable, must be moved out; the oil stocks and drilling rigs must be destroyed during the retreat” [Там же].

Nevertheless, the telegraphic correspondence between N. I. Ivanov, A. A. Brusilov, Aide to Military Governor-General of Galicia A. P. Polovtsev, and the Headquarters indicated that the former three were reluctant to make the final decision as some of the refineries and drilling rigs to be demolished “belonged to British and French companies and were worth

several hundred million roubles”; furthermore, “should the region be recaptured in the nearest future, the railways will have to be supplied with fuel”. However, General N. N. Yanushkevich, Chief of Supreme Headquarters, confirmed that “the oil wells and stocks must be destroyed immediately when the necessity arises” [РГВИА. Ф. 2067. Оп. 1. Д. 564. Л. 564. Л. 31]. As it turned out later, “eventually, no damage to the private oil refineries was necessary, and all the facilities remained intact” [Там же. Ф. 13216. Оп. 1. Д. 95. Л. 17].

The destruction of the Drohobych Refinery and oil storage plants was delegated to military engineer Colonel V. A. Zashchuk [Там же. Ф. 2134. Оп. 2. Д. 539. Л. 439]. Zashchuk’s account of the operation [Там же. Ф. 13216. Оп. 1. Д. 95. Л. 18–19 об.], presented in May 1915, is partly cited in A. S. Ostrogradsky’s report [Отчет представителя Министерства торговли и промышленности, с. 9–10].

According to V. A. Zashchuk, all tank wagons available in Drohobych were filled with crude oil and fuel, “coupled up and dispatched to Lviv”, where “components of mechanisms and some valuable objects from the governmental oil refinery” were also transported. The remaining petroleum stocks of the Drohobych Refinery were “drained but not burned”, whereas “in the Boryslav – Tustanowice – Drohobych region all oil storages were set on fire”; also destroyed were “the oil reservoirs and drilling rigs, except for those few that were situated in Boryslav near the Boryslav–Drohobych road and could have delayed the movement of our forces if set on fire”. The private refineries remained “intact, apart from some of the instruments collected there for work”. The engineer claims that “the damage to the privately-owned plants was not necessary since their oil stocks and sources of raw materials had all been destroyed, rendering operations impossible, as was the case with the numerous oil plants that had operated across Austria, Hungary, and Germany. All of them had stood idle during the war due to oil shortages”.

V. A. Zashchuk stressed that the incineration of drilling rigs, reservoirs, and refineries was associated with many technical problems: “each facility had to be set afire separately as all of them are built in strict accordance with the fire safety rules. The main rule is that none of the structures should catch fire from the buildings located nearby” [РГВИА. Ф. 13216. Оп. 1. Д. 95. Л. 18 об.]. V. A. Zashchuk’s accounts demonstrated that the oil workers fully complied with the fire safety regulations imposed by the Galician authorities (“the oil facilities are widely spaced, and each of them is surrounded by a tall fence made of mesh and barbed wire; additionally, [oil] storage spaces and reservoirs are protected by an earth rampart measuring about 2 sazhen [4.2 m] in height”), which made work difficult for the engineering teams (“to set fire to a drilling rig, we needed to open several doors in it and ventilate the interior space”; in addition, “the doors, lined with iron sheets, were found locked and carefully boarded up”) [Там же. Л. 19]. V. A. Zashchuk had at his disposal two Cossack hundreds, one militia squadron, one infantry militia platoon, and a 20-strong engineering team of the 3rd Railway Battalion; he specifically pointed out that “there were

no accidents involving people” and that no harm had been caused to either the residents or their homes. “The team worked, willingly and productively, for more than 24 hours without taking any rest,” stressed V. A. Zashchuk.

The fires produced a strong impression on the retreating Russian servicemen. On 1 May 1915 Iosif Ilyin made the following entry in his diary:

Sambor is in flames; deafening explosions can be heard: they are blowing up the railway station, the storage houses, the bridges, and the road. The whole horizon is lit up by a sinister remote glow: Drahobysh [Drohobych] is burning, and the oil wells are on fire. Part of the oil has been spilled into the river, and the water is now ablaze. Przemyśl is in flames. The sky is shrouded with clouds of soot; soot is raining from the sky and landing on our clothes [Ильин, с. 111].

Years later, Count D. F. Geiden reminisced how “Drohobych came up in flames; the sky was black with soot which was rising from the burning drilling rigs” [Гейден, с. 19]. Another officer remembered getting caught in “the oil rain” [Архипов, с. 19]; according to A. F. Chekhovsky, “those who came closer to the fire... ruined their outfits as oil seemed to drip from above, covering their clothes with greasy black stains which couldn’t be removed by any means” [Чеховский, с. 351]. E. V. Ekk, who was present during the events, wrote that “the burning timber storage produced so much heat that it nearly set Turka on fire” (a city to the south-west of Drohobych), whereas “a colossal black cloud formed by the burning oil hovered above the surrounding area; it was difficult to breathe for miles around” [Экк, с. 428]. Some of the eyewitnesses, nevertheless, did not regard the situation as anything extraordinary because “the wells had already been on fire once, and the Austrians had been unable to put out the flames despite all their efforts; finally, some English company offered its services and, after much exertion, managed to extinguish the fire” [Чеховский, с. 350].

To a certain extent, the destruction of the oil wells around Drohobych put to the practical test many proposals for military applications of oil and petrol. Both compounds attracted the attention of many military inventors, who suggested using oil (petrol) to set fire to enemy soldiers and trenches, or even pouring fuel oil into rivers and burning it to destroy enemy forces, equipment, and fortification structures [Бахурин, с. 139–141]. A project to this effect was proposed by engineer P. I. Lazarev, who struggled for a long time to make himself heard by the commanders; Lazarev was convinced that by burning “20–30 million puds [320,000–480,000 tons] of oil, we will be able to flatten the terrain and make it homogeneously lethal; to destroy and turn any fences or bridges to ashes; to stop the clouds of noxious gases released by the enemy; simultaneously, the combustion products will poison the air, while the smoke and soot will make aiming difficult for the enemy troops” [Бахурин, с. 165]. Lazarev was not alone in his ambitious plans; the same amount of oil was requested by Colonel N. N. Dzhunkovsky, who proposed to capture Bosphorus by discharging the oil into the sea and setting it on fire [РГВИА. Ф. 2134. Оп. 2. Д. 539. Л. 525–526].

Consequences of oil industry destruction. The later use of oil facilities

The main question that arose after the Russian retreat from Galicia concerned the actual damage inflicted by the fires. V. A. Zashchuk was unable to provide any accurate evaluation of the “burnt oil stocks”. Thus, he estimated the capacity of oil storages in Kolpiec and Modrychi at 864,000 tons; “at a guess, the storages were at least one-third full [288 thousand tons]; all of them were burnt”. He also claimed that “many dozens of reservoirs with petroleum products, each holding from 50 to 100 thousand puds [800–1,600 tons] were destroyed”. Part of the oil stored at the plants in similar reservoirs was “discharged but not incinerated”. In addition, “fire was set to minor oil storages operating at each drilling rig”, which numbered many thousands. The fire also “destroyed many forests, pipelines, telephones, pumping stations, etc. The damage from the fires amounts to hundreds of millions of roubles,” concluded Zashchuk [РГВИА. Ф. 13216. Оп. 1. Д. 95. Л. 19].

A. S. Ostrogradsky challenged these conclusions; his report indicates that the residual stocks in Kolpiec and Modrychi “fall short of the figure given by Colonel Zashchuk (one-third of 54 million puds), i.e. 18 million puds [288 thousand tons]. In reality, the residual stocks totaled 8,191,505 puds of oil [ca. 131 thousand tons] and 2,053,789 puds of fuel oil [ca. 33 thousand tons]”. Moreover, “according to the information obtained from British representatives of the Drohobych oil industry through Bucharest, only 178 out of 1,400 drilling rigs operating in Boryslav, Tustanowice, and Mrażnica had been destroyed”, amounting to just 13 % of all facilities [Отчет представителя Министерства торговли и промышленности, с. 10]. Similar claims can be found in the report submitted by Captain P. A. Lupakov, who was appointed as an observer on V. A. Zashchuk by the commander of the 11th army: Lupakov concluded that not all targets had been destroyed [РГВИА. Ф. 2134. Оп. 2. Д. 539. Л. 441].

Historiographers also appear to disagree on the extent of the damage caused by the fires. According to the meticulous estimates made by the Polish historian T. Kargol, “the attacks at the Russian positions near Gorlice caused fires at the oil refinery and oil storage plants in Glinik Mariampolski” whereas “the oil refinery in Krosno was evacuated to Brno-Moravské” and “kerosene storages in Krakowiec burned down” [Kargol, p. 41]. Citing the data published by the Polish-language press in Austro-Hungary, T. Kargol reports that “the most serious damage was inflicted on the Tustanowice area, where 178 drilling rigs were burned. In Boryslav, 256 out of 450 wells were destroyed, 80 of which were eventually restored. The oil sector suffered direct (destroyed oil wells and crude oil stocks) and indirect losses (decline in production) amounting to ca. 60–100 million crowns” [Kargol, p. 40]. The estimates are consistent with the data provided by A. P. Ostrogradsky, who assesses the damage at “130 million crowns, or 52 million roubles” [Отчет представителя Министерства торговли и промышленности, с. 10].

Referring to documents issued by the Austro-Hungarian government, A. Frank claims that 229 out of 339 operational drilling rigs were set on fire, and all the fire safety equipment was destroyed. Surprisingly, while Tustanowice lost 42 out of its 79 oil wells, all the oil production facilities in Boryslav remained intact [Frank, 2005, p. 188]. Specialist sources addressing problems of the oil industry mention 182 wells (“some of which were under construction, others fully operational” [Лавский, 1927b, с. 269]) destroyed by the Russian forces. The discrepancies resulted from the differences in the estimation methods applied by the Austro-Hungarian authorities during the First World War on the one hand and the government of newly-independent Poland on the other.

Interestingly enough, contemporary Ukrainian historiography tends to agree with the exaggerated loss estimates cited by V. A. Zashchuk [Мазур, Патер; Ільницький]. Nevertheless, the Ukrainian sources are the only ones to directly refer to the damage inflicted on the environment by the Russian army (“the oil drained from the tanks and left unburnt created immense environmental problems by permanently ruining once-fertile agricultural lands”) although no particularly affected locations are specified [Ільницький, с. 302]. However, the First World War was not the first and not the last environmental disaster that struck Boryslav [Цайтлер].

Fairly soon, the Drohobych Refinery as well as the drilling rigs in Boryslav and other Galician cities were restored (some of the worst-damaged ones may have been capped until the late 1930s [Oleum, p. 6]). Following the retreat of the Russian troops, preparatory works started at the state-controlled plant late in May 1915, which enabled it (along with the privately owned refineries named Polmin and Galicia to become operational again [Kargol, p. 248; Metzis, p. 511]). In the summer of 1915, the first significant supplies of crude oil became available although the pre-war output levels were never achieved in 1916–1918 [Bartoszewicz, p. 45].

However, this was not the end of the story about the consumption of Galician oil by the Russian army. After the successful Brusilov Offensive in August – September 1916, the Russian forces recaptured the southern part of Eastern Galicia including Kolomea and Peczenizyn, two major oil production centers located to the south-west of Drohobych. Operations at oil refineries immediately started [РГВИА. Ф. 2071. Оп. 1. Д. 28. Л. 31]. The oil wells and refineries supplying the South-Western and partly Rumanian fronts “were operated by the Department of Finance, headed by the energetic A[ctive] S[tate] C[ouncillor] [N. P.] Chamov” [Там же. Л. 33].

According to N. P. Chamov's report, the oil refineries in Peczenizyn and Kolomea had significantly suffered during the hostilities (their stocks had been looted, their laboratories destroyed, and the stills were in dire need of repair); however, they fared much better than the several completely razed facilities in Nadwirna, Pasechnaya and Kolomea [РГВИА. Ф. 2005. Оп. 1. Д. 14. Л. 287]. Once the delivery of crude oil was organized and repairs completed, small but regular supplies of petrol and kerosene started to come from the state-of-the-art Peczenizyn Refinery, the most modern facility in the area.

By the beginning of July 1917, when the Russian troops had withdrawn from Galicia, the output of oil production facilities in Bytkovo, Kosmacz, and Sloboda Rungurska had grown to 2,000 tons per month. The demand for Galician oil continued to climb: as of 1 July 1917, 1,840 tons of oil had to be supplied to refineries to manufacture petrol, kerosene, and automobile engine oils; the rest was shared between urban electrical power plants and the army, part of the output was also handed over to the Romanian government every month. Most of the combustible materials found in Galician storage facilities in July 1917 were destroyed by the Russian forces during the retreat [РГВИА. Ф. 2071. Оп. 1. Д. 28. Л. 33].

* * *

The First World War brought the Russian army into contact both with territories relatively underdeveloped industrially, such as the eastern Turkish vilayets, and with regions comparable with the most industrialized parts of the Russian Empire. The oil-rich Austro-Hungarian Galicia with its robust oil production industry fell into the latter category.

The Galician industrial landscape, which had taken shape long before 1914, displayed all features typical of industrialized areas, from environmental issues caused by the intensive extraction and processing of mineral resources to social issues brought on by rural-urban migration, proletarianization, and pauperization. The First World War only exacerbated these problems.

The new Russian administration in Lviv, Drohobych, Boryslav, Kolomea, and other cities and towns set out to resume local oil production to, firstly, meet the economic needs of the residents in ‘the lands occupied by the law of war’, and secondly, satisfy the demand of the Russian army and railways in F&L. To achieve these goals, careful planning and restoration of the key oil infrastructure was required; however, regular operations never recommenced. The Russian administration and commandment were able to utilize only part of the stocks of oil and petroleum products accumulated before the war as the restoration and launching of the enterprises would have required considerable human and financial resources.

At this stage, the government-controlled Drohobych Refinery and the drilling rigs in Boryslav as well as many other locations became part of the combat landscape, an element in a complex supply chain providing the Russian army and the population in the rear with essential commodities. The final transformation occurred during the hasty retreat of the Russian troops when all oil production facilities had to act as elements in the military deterrence system designed to slow down the enemy offensive and cause economic damage through the destruction of the production assets. The destruction of oilfields and refineries by the Russian army in 1915 was followed at the end of 1916 by similar operations of the Entente in Romania. Moreover, military theorists of the interbellum named the erasure of natural sites and man-made facilities in the frontline area one of

the most important methods of warfare during that period of WWI [Карбышев, Киселев, Маслов].

However, despite the above, oil production facilities never really became “combat formations” in their own right; indeed, when making and implementing decisions to destroy oil wells and plants, the Russian commandment would consider many non-military circumstances such as the high cost or the allies’ ownership of the facilities. This logic prevented the war in Galicia from totalization, owing to which the oil industry quickly recovered, and the Drohobych plants became operational again. The destruction of the Galician oil production capacities by fire, while standing out in terms of scale, became just one of many events in the long chain of industrial disasters; its effects were successfully mitigated by fire safety precautions taken before the war rather than by any concerted actions of the German and Austro-Hungarian forces.

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