FORUM HISTORIAE

Heavy Industry and its Environmental Impact in Northern Hungary between 1950 and 1980

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Abstract

PÁL, Viktor: Heavy Industry and its Environmental Impact in Northern Hungary between 1950 and 1980.

This article aims to tell the ‚pre-history' of environmental movements in East-Central Europe with a special emphasis on Hungary and her prime industrial region, the Borsodi Basin in the valley of the Sajó River.

Soon after the communist takeover, the Borsodi Basin was designated as one of the new Stalinist industrial centers of Hungary. The First Five Year Plan (1950-4) treated the geographical axis between Ózd and Miskolc as a top economic priority. Heavy industrial investments continued after 1956, and the Borsodi Basin, including the towns of Miskolc, Ózd, Kazincbarcika, Sajószentpéter and Leninváros, emerged as a fortress of both old coal and new natural gas/oil based production centers, second only to Budapest.

The Borsodi case was not unique internationally. Rather the contrary, what Borsod witnessed was the stereotypical vicious circles of industrialization, urbanization, water shortage, water supply extensions, increasing water pollution and expensive water cleaning projects, which had changed many of the European industrial areas since the eighteenth century.

During the 1960s and 1970s the dominance of iron and steel manufacturing was contested by the emerging thermoplastic and petrochemical production in Borsod. New chemical factories represented an internationally competitive branch of industry in comparison with Europe, but also released significantly more harmful and larger amounts of wastewaters than iron and steel works. To control industrial wastewater discharges on a larger scale, the Hungarian state tightened its ambiguous and inefficient wastewater fine system in 1968.

During the 1970s, the Hungarian wastewater fine system, combined with economical industrial investments and end-of-pipe technologies, was able to significantly reduce energy needs and discharged wastewater per production ton. Simultaneously, the state facilitated individual environmental concerns of citizens within the controlled spheres of society. Professional and social debates over water issues increased rapidly after 1956. Due to escalating water pollution issues the water quality of the Sajó River and her tributaries was at the forefront of professional and public concern in Borsod from the end of the 1950s.

Keywords: environment, pollution, heavy industry, chemical industry, iron and steel industry, environmental protection, state-socialism, Hungary, Kádár- regime, Miskolc

We possess very little exact information on the environmental impact of industrialization and urbanization in East-Central Europe prior to the rise of social movements in the 1980s. There have been too many anecdotal and journalistic accounts published and only very limited precise information persists exists on the industrial and urban environmental history of East-Central European countries, especially during the decades of state-socialism.

This article will analyse a “pre-history” of environmental movements. I aim to ask important questions about the type of industrialization and urbanization, and their environmental impact, that occurred in East-Central and Western Europe before the 1980s. I aim to present the environmental impact of industrialization and urbanization through “typical” cases studies, which will serve as laboratories for my investigation.

For East-Central Europe the Borsodi Basin industrial area in Hungary has been chosen, because it has always been a traditional industrial area built on coal and iron production, and was further developed by the state-socialist regime. Borsod evolved to be an important industrial area, and was employing 10 per cent of the industrial workforce in Hungary by the late 1970s.

Map: Borsod-Abúj-Zemplén county of Hungary. Source: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

A number of social scientists have researched the environmental conditions of East-Central Europe (ECE) since the 1970s. Research projects and published works were accumulated between 1989 and 1995. Today we may consider these works as: *"descriptive and anecdotal"* which *"recite the now widely accepted mantra of grey landscapes and polluted lands."*[1]

Hilary F. French's apocalyptic account of the environmental conditions of East-Central Europe published by the Worldwatch Institute in *Worldwatch Paper 99* in 1990 could represent this mantra well. French writes: *"Under the assault of air pollution and acid deposition, medieval cities are blackened and crumbling, whole hillsides are deforested, and crop yields are diminishing. Rivers serve as open sewers, and clean drinking water is in scarce supply. Perhaps most alarming*

1 PAVLÍNEK, Petr - PICKLES, John. *Environmental Transitions. Transformation and ecological defense in Central and Eastern Europe*. London; New York : Routledge, 2000, p. 9.

of all, people are dying from pollution. In the dirtiest parts of the region, life expectancies are years lower and rates of cancer, reproductive problems, and a host of other ailments are far higher than in cleaner areas."[2]

Such apocalyptic descriptions and sweeping generalizations do not provide an accurate historical analysis of the management of environmental matters during state-socialism. French was only one among numerous Western scholars, notably social scientists, who failed to see environmental discourses in East-Central Europe in their entire complexity. Social scientists working on the recent past of East-Central Europe were blinded by the devastating picture of the crumbling of communism in the late 1980s. At the time most of state-socialist industry was in critical shape, and environmental damage in certain areas, commonly referred to as "environmental hot spots" was dramatic.

Westerners' negative perception of the state of the environment and the importance of environmental protection during state-socialism was partly fed by one-sided narratives of East-Central European intellectuals, scholars, and activists, who presented their oral histories from an oppositional perspective. In a volume edited by Barbara Jancar-Webster, Hungarian author Sándor Péter shares the stereotypical view of Western scholars on state-socialist environmental protection. Péter assumed that the cause of such wide spread pollution in Hungary was not only negligence, but also the state-socialist system's *"philosophical basis, the communist ideology"* which was programmed to produce pollution.[3] Péter did not elaborate on how exactly communism or state-socialism includes pre-coded environmental devastation. Instead, he presented the rather stereotypical answer on how environmental destruction became a large-scale issue during the forty years of communist rule in Hungary: *"Unfortunately, it (the environment) was not seen as such (a problem) at the governmental level.* […] *Although environmental issues were always paid lip service, especially from the late 1970s on, in general, East Europe was in fact the most polluted region on the continent in the era of state-socialism."*[4] Péter continued to investigate the reasons for such a devastating environmental situation: *"Neither the population, nor the academics nor the authorities were really and fully aware of the social costs of the growth of production to society's well-being. They were especially ignorant of the real and accurate indices of environmental quality and pollution. This lack of knowledge is partly due to the traditional socialist 'mystique' of handling such 'strategic' indicators, and partly the inefficient system of national statistics. Information was in general monopolized."*[5]

Recent scholars have enriched and altered the previously "one-sided", "cold war-influenced", "black-and-white" scientific view on the environmental history of state-socialism in East-Central Europe. Today we know that state-socialist industrial and urban development had as negative

2 FRENCH, Hilary F. *Green Revolutions: Environmental Reconstruction in Eastern Europe and the Soviet Union*. Washington D.C. : Worldwatch Institute, November 1990 [Worldwatch Papers 99], p. 10.

3 PÉTER, Sándor. New Directions in Environmental Management in Hungary. In JANCAR-WEBSTER, Barbara (ed.). *Environmental Action in Eastern Europe: Responses to Crisis.* London : Amonk, 1993, pp. 29 and 31.

4 SÁNDOR 1993, p. 29.

5 SÁNDOR 1993, p. 29 and 31.

environmental consequences as Western European industrialization and urbanization had. We also know that environmental policies in state-socialism worked, to a large extent, similarly to Western European policies. But was East-Central European industrialization, urbanization and their environmental impact different from the industrial and urban development and environmental devastation that unfolded in Western Europe? I plan to answer this question in the article.

Between 1950 and 1973 Western Europe experienced an extremely long period of uninterrupted economic growth. This Golden Age of extensive development ended with the oil crisis in 1973; soon after, Western European growth rates declined, and the Eastern European economy shrunk into stagnation, and later depression. During the Golden Years Europe's growth was sustained and was higher than in the rest of the world. According to Derek Aldcroft *"between 1950 and 1970 European gross domestic product grew on average at about 5.5 per cent annum and 4.4 per cent on a per capita basis, as against world average rates of 5.0 per cent and 3.0 per cent respectively. Industrial production rose even faster, at 7.1 per cent a year compared with a world rate of 5.9 per cent."*[6]

Annual GDP growth per capita was comparable to Western European levels in the entire Soviet bloc and in East-Central Europe. According to data by Crafts and Toniolo, Czechoslovakia produced 3.08 per cent annual growth, Hungary 3.6 per cent, Poland 3.45 per cent and East Germany 4.47 per cent.[7] Rapid changes in economic output sped-up structural changes in both Western Europe and East-Central Europe.

Post-war extensive growth was accompanied by a rise in air, water, and land pollution in both Western and East-Central Europe. During the latter part of the 1940s and in the early 1950s, industrial pollution in Germany was often considered a necessary and unavoidable side product of economic growth. In 1951, a medical official in Duisburg concluded that the local population had come "to terms" with industrial air pollution. Similar to the Duisburg case, in December 1951, the city council of Frankfurt passed a decree that accepted industrial pollution as a nuisance which "must be accepted" in the interest of "industrialization" and "reduction of unemployment".[8]

Such attitudes were typical in West Germany in the late 1940s and early 1950s, and they were true to an even greater extent in East-Central Europe. There, extensive development was the basis of economic policy in the 1950s. During the First Five Year Plan (1950 – 1954) in Hungary, several key industrial developments were constructed in regional industrial centres and in new Socialist towns. Budapest was considered to be developed already, therefore the regime aimed at industrializing backward rural areas.

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6 ALDCROFT, Derek. *The European Economy 1914-2000*. New York; London : Routledge, 2001, p. 128.

7 BROADBERRY, Stephen - O'ROURKE, Kevin (eds.). *The Cambridge Economic History of Modern Europe*. Cambridge : Cambridge University Press, 2010, pp. 301-302.

8 UEKÖTTER, Frank. *The Age of Smoke: Environmental Policy in Germany and the United States, 1880-1970*. Pittsburgh : University of Pittsburgh Press, 2009, p. 133.

After 1948, in accordance with the centralization line, water management bodies of the Hungarian state were also centralized. In 1952, after Stalinist purges in the water sector, the communist regime reorganized water administration in Hungary. The new head administrative body was called the National Water Management Office (Országos Vízgazdálkodási Hivatal, OVH). The VITUKI research cluster was integrated into the OVH. In 1953 the OVH was changed to the National Water Directorate (Országos Vízügyi Főigazgatóság, OVF).[9] In 1968 the OVF was renamed as the National Water Management Office (Országos Vízügyi Hivatal, OVH). The OVH, OVF, then OVH again, and their departments, exercised strong central control and represented state authority over water resources in Hungary.[10]

In 1954 the OVF set up twelve regional Water Superintendents among the North Hungarian Water Superintendency (Észak-Magyarországi Vízügyi Igazgatóság, ÉVIZIG) to supervise the rapidly industrialized Borsodi Basin. ÉVIZIG was responsible for the protection of waters and for the monitoring and fine setting procedures after 1961.[11]

In 1962, Sándor Vezse, director of the ÉVÍZIG superintendency, aimed to gain respect and legitimacy for ÉVÍZIG among audited factories by targeting the Lenin Metallurgical Plants (LKM), one of the flagship production units in Borsod, first. LKM seemed to be an obvious choice from Vezse's point of view, because that factory had significant pollution issues after the start-up of the First Five Year Plan. In the mid-1950s, state authorities were concerned about the epidemic threat posed by a mixture of household sewage and industrial wastewaters discharged from the LKM into the Szinva Creek. According to the surgeon general, LKM's pungent stench of phenols and oils was notoriously noticeable to the people of. Vezse thought that if ÉVÍZIG could force the LKM to pay sizable water pollution fines, it would send a message to other Borsodi industrial plants that the environmental agency was strong and should be taken seriously in the future. He wrote in company correspondence: *"(T)his plant* [the LKM] *is always in public view, and the whole city can see its wastewaters and their impact daily. Our fine decree has already achieved considerable results, even before becoming a final fine* [on the second decision]. *The Szinva* [Creek] *is visibly cleaner since a one million Forint fine hangs over the plant."*[12]

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9 1060/53 (IX.30) order of the Council of Ministers. In *A Magyar Országos Levéltár Segédletei 11/4. Minisztertanácsi Jegyzőkönyvek Napirendi Jegyzékei, 1952.08.14.- 1955.04.18.* [Guides of National Archives of Hungary 11/4. Agenda Lists of Protocols of the Council of Ministers 14.08.1952-18.04.1955]. Budapest : Magyar Országos Levéltár, 2008, p. 97. Available on Internet: http://mnl.gov.hu/download/file/fid/36614 (Accessed on August 20, 2016).

10 GERENCSÉR, Árpád. A magyar vízgazdálkodás fejlődése 1945 és 1990 között [The Development of Water Management in Hungary between 1945 and 1990]. In *A Magyar Hidrológiai Társaság XXX. Vándorgyűlésének dolgozatai* [Proceedings of the 30th Annual Conference of the Hungarian Society for Hydrology], 2012. Available on Internet: http://www.hidrologia.hu/vandorgyules/30/dolgozatok/dolgozatok.html (Accessed on August 20, 2016), pp. 9-10.

11 GERENCSÉR 2012, pp. 10-11.

12 *"(E)z az üzem állandóan szemelőtt van és naponta az egész város látja a kibocsájtott szennyvizeket és azok hatását. A bírságoló határozatunk már jogerőre emelekedés előtt is igen számottevő eredményt ért el. Szemmel láthatóan tisztább azóta a Szinva, mióta az üzem felett milliós nagyságrendű bírság lebeg."* Felterjesztés. Északmagyarországi Vízügyi Igazgatóságtól az Országos Vízügyi Főigazgatóság Jogügyi Osztálya felé. Ügyszám: 87.782/1962 Lenin Kohászati Üzemek szennyízbírsága [Petition. Northern Hungarian Water Superintendency to the Department of Legal Affairs at the National Water Directorate. Case 87.782/1962, Water pollution fine of the Lenin Metallurgical Plants] (5238). Környezetvédelmi és Vízügyi Levéltár [Environmental and Water Archives],

Vezse's tactics proved successful. Dramatic monitoring results, however, were not merely the consequence of devastating and unparalleled environmental destruction. In fact, extreme monitoring outcomes were the result of an interplay between relatively high and toxic pollution discharges and the very small dilution capacity of the Szinva Creek. This fact did not prevent Vezse from being obsessed with the water quality and the impact of the sewage and industrial wastewaters discharged by the LKM (Közegészségügyi Járványügyi Állomás, KÖJÁL) on public health. Such public health concerns might also have been influenced by aesthetic concerns and public pressure. It is easy to see why the ugly view and pungent stench of the flow of the Szinva, which carried a mix of urine, faeces, grease and phenols, outraged the residents of state-socialist Miskolc, even though the heavily polluted discharge of the Szinva had little impact on the quality of the larger downstream rivers, the Sajó and the Tisza.

Companies could appeal the first decision to the OVF. In such cases the OVF would revisit each case and set a final fine to be paid. Typically the OVF reduced the fines to be paid during the appeal process. Wastewater discharge fines set for the LKM and ÓKÜ by the OVF in the second decision varied roughly between 2.7 and 4.7 million Forints during the period between 1962 and 1968. The average bargaining rate from the first decision ÉVÍZIG fines was generally settled by the OVF at around 20 per cent. In my view, reductions could have been steeper, and documents give the impression that the OVF generally respected the decision and the size of the fines set by ÉVÍZIG. Compared to company budgets, 3-4 million Forint fines were little more than bee stings for the LKM and ÓKÜ, but were still unwelcome economic losses with a promise of rising. For the LKM and the ÓKÜ fines were high enough to trigger some action and facilitate environmental protection investments.

As a direct response to annual discharge fines, the LKM and the ÓKÜ implemented a number of immediate cheap and small, do-it-yourself water protection amendments. Such investments were recommended by ÉVÍZIG in annual wastewater fine reports. ÉVÍZIG claimed that if recommended investments were carried out in a timely manner wastewater fines might be reduced in the future. In fact wastewater fines for the ÓKÜ showed a decreasing trend between 1962 and 1968. Fines set for the LKM also decreased after 1962, but showed an increasing trend between 1966 and 1968.

The Water Fund (Vízügyi Alap) was able to provide help with some of the most serious environmental problems of production units between 1962 and 1968. In theory, the Water Fund was operated by collected wastewater discharge fines that were paid by industrial plants. In reality, collected fines were not solely used for environmental protection purposes. Also, the use of funds was dubious according to documents. Some factories applied and struggled to gain even modest funding, even though their environmental situation was critical. Meanwhile, authorities allocated large funds for other plants with similarly serious, but publicly more apparent, environmental issues. As a rule, the visibility of the environmental problem made

(hereinafter KVL), 6.9.0. Miskolci ÉVÍZIG 314. 2.

mobilizing large environmental funds easier. For example, the LKM received a lump sum of 40 million Ft between 1965 and 1967 from the Water Fund. Such an amount was as great as the total paid wastewater discharge fines of the LKM throughout the 1960s. It should be noted that the LKM was in a privileged position, because the pollution of the Szinva, mostly discharged by the LKM, emerged as a public concern by the early 1960s. Environmental funds were dispensed in three instalments to the LKM. In 1965, 2 million Ft were transferred for the design and preparation of a central wastewater treatment plant. Construction costs were covered by an additional 38 million Ft grant (20 million in 1966 and 18 million in 1967). Even though, the ÓKÜ suffered wastewater discharge issues at the time comparable to the LKM, the Ózd mills only received a meagre 3 million Ft funding from the Water Fund between 1962 and 1968.

At the LKM phenols, the company's most notorious pollutants were also eliminated by economical production measures. Getting rid of phenols, however, had little to do with end-of-pipe technologies and the newly introduced wastewater discharge fine system. By 1968, the LKM, along with most major heavy industrial plants in Borsod, had shifted from coal to natural gas in energy production. When heavy industrial giants, such as the LKM, were connected to the national gas grid and began to produce energy without coal, these plants instantly abandoned the discharge of phenols. I discussed earlier how phenol discharges posed hard challenges to the iron and steel industry in Germany from the late nineteenth century. After 1948 phenol discharge problems escalated in Borsod. This is why it was the LKM's major concern to get rid of their phenol discharges. Before the LKM shifted from the use of coal to natural gas in energy production, this company spent 60,000 Ft in 1964 on the design of a phenol neutralizer. The phenol remover machinery should have been constructed by 1966 with a budget of 1.5 million Ft.[13] However, this phenol remover was never built because the LKM shifted from coal to natural gas in 1967. Within months phenols were rapidly eliminated from her wastewaters. Similar events unfolded in the ÓKÜ, where coal fuelled energy production stopped on March 1, 1967.[14]

By the 1960s thermoplastics production had boomed worldwide. PVC, one of the most successful forms of thermoplastics, was perceived as a "miracle product" during the 1960s and 1970s. Compared to some rare and expensive metals, plastics were abundant and relatively cheap. PVC emerged as a substitute for more expensive and rare materials in household and industrial machinery, in windows and doors, in interior design and in everyday household items globally.

Khruschev's administration supported the development of large scale chemical and petrochemical projects in the Soviet Union and in COMECON countries. The Soviet Union's abundant fossil fuel resources provided a solid base for the massive development of the chemical industries in state-socialist countries. In 1958 COMECON member countries decided to place

13 Jegyzőkönyv. Felvéve 1964. VIII. 4.-én a LKM főenergetikusi irodájában [Minutes. Recorded on August 4, 1964 in the office of Chief Energeticist of the LKM] (5258). KVL, 6.9.0. Miskolci ÉVÍZIG 314. 3.

14 Ózdi Kohászati Üzemek Szakvélemény 1966. X. 24., 13236/1966, Horváth Károly főenergetikus [Ózd Mettallurgical Plants Expert opinion October 24, 1966, 13236/1966, Károly Horváth Chief Energeticist] (4964). KVL, 6.9.0. Miskolci ÉVÍZIG 314. 1

serious/strong emphasis on the development of the chemical industries, which would dominate their industrial investment programs until 1975. In Hungary, where the iron and steel industry did not fulfil the promise of bridging the economic gap between the East and West, petrochemical products and thermoplastics provided new hope of overtaking the West in an important branch of production. Hungary was especially keen on developing new chemical production capacities, because this country was poor in raw materials compared to other East-Central European states.

Hungarians needed the cheap and abundant oil and natural gas supplies of the Soviet Union to produce PVC on a large scale. Crude oil and natural gas also provided the possibility to establish and develop new chemical industries, especially in plastics and petrochemical production. Large funds were directed to establish large chemical combines such as the BVK, the Tiszai Chemical Combine (Tiszai Vegyi Kombinát, TVK) in Leninváros and an oil refinery plant and a complementing industrial symbiosis system in Százhalombatta.

After modest beginnings in the early 1960s, national PVC production grew rapidly in Hungary during the second half of the 1960s and the 1970s.[15] The BVK emerged as the prime PVC producer and one of the flagship heavy chemical plants in Hungary by the late 1970s. Between 1961 and 1965 the 6,000 t/y BVK PVC I. production unit made up less than one third of the total national PVC production investment during the same period of time.

During the 1960s PVC I. underwent three large extension projects. As a result, her wastewater discharges, which may have been comparable to the environmental impact of the LKM and ÓKÜ in the beginning of the 1960s, grew nearly tenfold between the early 1960s and the early 1970s. Water protection measures, which produced some successes in the cases of Diósgyőr and Ózd during the 1960s, rapidly lost relevance against the massive amount of oils, acids and ammonia that were released by the BVK and sister chemical combines.

As a result of large scale investments at the BVK and the TVK, domestic PVC production reached 100,000 t/y in the early 1970s. This amount was about ten times higher than the Hungarian PVC output of the previous decade. Still, the Union of the Hungarian Chemical Industry (Magyar Vegyipari Egyesülés, MVE) estimated that domestic and export demand for PVC was higher than production by 40-50 per cent. PVC production at the BVK continued to trail demand during the Third and Fourth Five Year Plans (1966 – 1970 and 1971 – 1975). Alongside domestic consumption the importance of foreign markets expanded. The BVK's exports had risen sharply to 238 million Forints annually by 1972.[16]

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15 1961. évi II. törvény a Magyar Népköztársaság második ötéves népgazdaság-fejlesztési tervéről az 1961. január 1-jétől 1965. december 31-ig terjedő időszakra. II. Fejezet. Az ipar, az építőipar, és a közlekedés fejlesztése. C, Vegyipar [Act II/1961 of the Second Five Year Plan of the People's Republic (effective) for the period from January 1, 1961 to December 31, 1965. Second Chapter: Development of industry, construction and transportation. C, Chemical Industry]. In *1000 év törvényei On-line Törvénytár*. [*1000 Years' laws. Online code of law*]. Available on Internet: http://1000ev.hu/index.php?a=3&param=8435 (Accessed on February 6, 2016).

16 Magyar Vegyipari Egyesülés. Tájékoztatás az iparág és a tagvállalatok környezetvédelméről [Hungarian Union of the Chemical Industry. Information about the environmental protection of the industry and its member

When PVC II. was completed in 1971, it was soon followed by PVC III., which added another 150,000 t/y to the BVK's PVC capacity in 1977. PVC III. was a massive 11.3 billion Ft investment, which equalled about 80 per cent of the company's total investment budget between 1971 and 1977. The vinyl chloride plant produced 60,000 t/y. Vinyl chloride production was based on the 80,000 t/y ethylene supply of TVK in Leninváros.[17] As part of this project a 120,000 t/y capacity Electrolysis Unit, the largest of its kind in Hungary, was built. PVC III. was also one of the first heavy industrial investments in Borsod to include substantial environmental protection funds.[18]

PVC III's chloride production was based on a formula used by the De Nora Company in Italy.[19] Equipment at the monomer unit was based on the Goudricke patent and was supplied by the Badger Company in United States. Machinery at the polymer unit was an automated and computerized system produced by the Shin Etsu Company in Japan. According to the MVE, at the time of construction the PVC III. polymer unit had the fourth largest production capacity in the world, preceded only by one Japanese and two American production plants.

Production technology at PVC III. was substantially more efficient and environmentally friendly than earlier polyvinyl chloride plants in Hungary. For example, PVC II. devoured 500 grams of mercury for each chloride ton produced. In comparison, PVC III. used only 50 grams of mercury per chloride production ton. Trial runs of PVC III. began on April 4, 1978. Simultaneously, a three-phase effective wastewater treatment plant was installed in the proximity of the factory.[20]

First the BVK successfully avoided the attempts of ÉVÍZIG agents to determine the exact amount of wastewaters discharged from that factory. BVK personnel would not provide information on the total amount of industrial water used and discharged. In the short run the BVK's strategy was successful and impeded the attempts of the environmental authority to set preventive wastewater discharge fines. As a result, ÉVÍZIG reports between 1962 and 1968 were full of harsh comments on the unlawful conduct of the BVK, and the disastrous environmental impact of the technology used in PVC I. and II.

In 1966 Gyula Harencsár, a representative of the BVK, defended his company in a letter addressed to the OVF, the court of second instance in water pollution issues, stating that the BVK had already applied for and planned to invest sufficient funds from central authorities to improve the company's wastewater treatment practices. According to Harencsár, it was not the BVK's responsibility, and that at the time of his appeal to the OVF such funds from the government had not been received. He argued that without the construction of an effective

companies]. Budapest : Magyar Vegyipari Egyesülés, 1978, pp. 1-6.

17 PAPP Attila. *Ismerkedjünk Kazincbarcikával* [Introduction to Kazincbarcika]. Kazincbarcika : Kazincbarcikai Városi Könyvtár, 1974, pp. 42-54.

18 Magyar Vegyipari Egyesülés 1978, pp. 1-6.

19 It is unclear whether the machinery was produced and shipped from Italy, or if it was patented from Italy and produced in Romania, or if just a number of parts of the equipment were purchased from Romania.

20 PAPP 1974, pp. 42-54.

wastewater treatment facility at the BVK, which only could be financed by central authorities due to its high costs, the BVK alone was powerless to prevent its own industrial water pollution from being discharged into the Sajó River. Harencsár also pointed out that even though the BVK was unable to install a full wastewater treatment facility on its own, the company had already purchased some wastewater cleaning machinery. Some of this equipment, such as an ammonium-sulphate extracting machine, had not yet been installed for technical reasons, but would begin operation in the near future. Harencsár added that some pollutants, e.g. carbide sludge, should not have been taken into account when calculating the BVK's annual water pollution fine, because they were discharged into the Sajó River with approval from ÉVÍZIG. Harencsár concluded his 1966 appeal with a full denial of responsibility for any environmental harm caused by the BVK.

The 40/1969 Governmental Order reformed the Hungarian wastewater discharge calculation system completely. As a result, set wastewater discharge fines for the BVK and several other plants skyrocketed.[21] In the mid-1960s, the BVK paid an average 1.3 million Forints in wastewater discharge fines. Five years later, upon the introduction of the new wastewater discharge calculation system, fines multiplied by 18.

Monitoring methods after 1968 fundamentally remained to the same as the previous period, however, calculation methods changed radically. After 1968, polluters paid after the amount of pollution was calculated. Dilution, discharge of river courses and upstream pollution did not matter in the new system. This meant a dramatic change for polluters who discharged their wastewaters into larger rivers, such as the Sajó River. Simultaneously, pollution limits grew stricter.

A 1972 complex environmental report within the BVK projected wastewater discharges for the coming three years. This environmental report predicted that the amount of discharged wastewater would keep decreasing, as it had been shrinking by 25 per cent between 1971 – 1972. However, the limits of fines would keep growing higher faster than the shrinking of discharged wastewaters. Such tension would drive wastewater discharge fines up, despite positive changes.

Harsh wastewater discharge fines rapidly mobilized financial sources at the BVK. Between 1971 and 1975, this company invested 68.3 million Ft on wastewater treatment methods from company funds. This sum was not enough for the construction of a complex wastewater treatment plant, but could fund some effective environmental investments.

One of the largest wastewater treatment projects of the BVK during these years was the construction of two 100,000 m^3 oil and grease settling ponds. In 1975, these ponds were complemented with five air blowers to speed up the cleaning process. In addition, there was a handful of isolated wastewater cleaning investments, which eliminated certain pollutants from individual production units. For example, a remover was installed to eliminate arsenic pollution

21 40/1969 Governmental order about wastewater pollution discharge fines, Enacted on November 25, 1969.

in the fertilizer factory. A filter was installed to prevent pollutants from entering the fertilizer factory's cooling water. Settling ponds were installed at Polymer I. A post-production sedimentation unit was constructed at Polymer II. Ammonia and ammonium (NH3, NH4+) extractors and chemical neutralizers were built at the Caprolactam factory. Further investments were organic waste stripping, Hydrogen-Chloride and Carbide Sludge extraction at the Vinyl-Chloride Plant. All together, investments installed between 1971and 1975 improved the quality of discharged wastewater from the BVK. A breakthrough, however, was not yet t achieved, and the building of a complex wastewater treatment plan by the end of the 1970s was promised.

New wastewater treatment systems grew more complex, as did their operation, which required more man power, energy, and money. In 1972, running waste water treatment cost 19,683,500 Ft at the BVK.[22] Despite investments and the rising operational costs of environmental systems, the BVK still had to pay 22 million Ft discharge fine in 1972. Much of it (17,751,747 Ft) was due to the floating material discharged from the PVC II. unit. Such an incident, however, was only a temporary nuisance and BVK wastewater discharge fines had begun to decrease to 3.6 million Ft by 1975.[23]

The BVK, which was one of the many black sheep of heavy industry in Borsod in the 1960s, changed its environmental attitude radically within a decade. BVK management, which handled environmental relations and demands of regional superintendents neglectful throughout the 1960s, may have realized, after having received approximately 60 million forints of annual fines within three years between 1969 – 1971, that cooperation with environmental authorities was probably their best strategy. In 1970, company management was also changed, and under the new director general, István Körtvélyes, environmental protection emerged as a relatively important concern.

Epilogue

Parallel with the shift from being a neglectful industrial plant to an environmentally conscious company, the BVK began to pay more attention to public relations. Between 1972 and 1977 a great number of articles continued to focus on what was a typical agenda of local media: the bad quality of the Sajó River. The overall quality problems of the Sajó River were viewed quite critically and accurately in my view. Apologetic media coverage was uncommon, and severe criticism over pollution issues, and what was believed to be deteriorating environmental conditions was the norm in the Borsodi media from the mid-1960s.

Environmental criticism was accompanied by a technological mindset to solve pollution problems via technological investments. The more money and the more effort that would flow into environmental protection the better the standards the Borsodi plants would achieve. The following excerpt from an article published in *Déli Hírlap*, a Miskolc based daily, in 1973

22 Jegyző könyv. 1980.03.20. BVK 1979 évi szennyvízbírságának hatósági tárgyalása. [Minutes. 20 March, 1980. The court hearing of the 1979 wastewater discharge fine of the BVK]. Author's possession.

23 A Borsodi Vegyi Kombinát szennyvízhelyzete a IV. Ötéves tervben. Author's possession. 2. Appendix. No. 5.

summarizes well the prevailing attitudes over environmental issues during the 1960s: *"The pollution of waters is reaching a catastrophic level. The damage caused by the pollution of water is exceeding 600,000,000 Ft annually.* [...] *The fixed pollution fine does not prevent further environmental pollution. The total amount of fines reached 130,000,000 Ft last year, but this did not motivate factories or plants to install wastewater treatment equipment. The installation and usage of such equipment is significantly more expensive than the fine."*[24]

Concluding Remarks

This article aimed to tell the "pre-history" of environmental movements in East-Central Europe with special regard to Hungary and her prime industrial region, the Borsodi Basin in the valley of the Sajó River.

Heavy industrial regions sprung up in various parts of Europe after the late eighteenth century. After the spread of iron and steel industries and chemical production in Britain, Wallonia, Germany and Silesia, heavy-industrial production was concentrated in Hungary as well. Soon after the communist takeover, the Borsodi Basin was designated as one of the new Stalinist industrial centres of Hungary. The First Five Year Plan (1950 – 1954) treated the geographical axis between Ózd and Miskolc as a top economic priority. Heavy industrial investments continued after 1956, and the Borsodi Basin, including the towns of Miskolc, Ózd, Kazincbarcika, Sajószentpéter and Leninváros, emerged as a fortress of both old coal and new natural gas/oil based production centres, second only to Budapest.

It is very important to note that industrialization in Hungary, as in other East-Central European countries, had an impact on the urban and the natural environment similar to that in Western Europe prior to the Second World War. Former industrial settlements in the Borsodi Basin boomed after the start of the First Five Year Plan. Apartment style housing was constructed for the incoming urban population, with running water and water closets in a growing number of apartment units. Residential water use multiplied throughout the 1950s and 1960s as a result of more civilized urban housing conditions. Thus industrial water use soared as a result of extended industrial production. In Borsod, iron and steel plants devoured water on a massive scale during in the 1950s.

From the 1960s on, new chemical plants were built and extended in Kazincbarcika and in Tiszaújváros. The rapid development of chemical production and its extremely high water needs put further stress on the already troubled regional water supply system in Borsod. Gigantic industrial water needs were very difficult to meet.

The Borsodi case was not unique internationally. Rather the contrary, what Borsod witnessed was the stereotypical vicious circles of industrialization, urbanization, water shortage, water supply extensions, increasing water pollution and expensive water cleaning projects, which had changed many of the European industrial areas since the eighteenth century.

24 *Déli Hírlap*, January 13, 1973.

For example, during the second half of the nineteenth century the Rhine evolved into an industrial water source waterway, and wastewater sewer, for Switzerland's, France's and Germany's iron, steel and chemical industries. The same thing happened to the Sajó River in the Borsodi Basin after the acceleration of industrialization and urbanization throughout the second half of the twentieth century. A significant difference between the Rhine and Sajó cases of industrialization was their timing and scale. Firstly, in Borsod, production, urbanization and pollution on a massive scale appeared as late as the 1950s. This was significantly later than in the Ruhr area, which was already producing large scale pollution problems during the second half of the nineteenth century, and which renewed on a grand scale after the Second World War. Also, the scale of pollution was significantly smaller in Borsod than in the Rurh area. Hundreds of thousands of inhabitants were located in Borsod, compared to millions residing in the Ruhrgebiet. Dozens of large plants operated along the Sajó, instead of the hundreds of large production sites which were typical along the Rhine.

Still, the result of industrialization and urbanization in Borsod was similar to larger and older iron-, steel- and chemical based industrial areas, of which the Rhine, a symbol of an international history of water pollution, has been the most famous.

During the 1960s and 1970s the dominance of iron and steel manufacturing was contested by emerging thermoplastic and petrochemical production in Borsod. New chemical factories represented an internationally competitive branch of industry in comparison with Europe, but also released significantly more harmful and larger amounts of wastewaters than iron and steel works. To control industrial wastewater discharges on a larger scale, the Hungarian state tightened its ambiguous and inefficient wastewater fine system in 1968.

During the 1970s, the Hungarian wastewater fine system, combined with economical industrial investments and end-of-pipe technologies, was able to significantly reduce energy needs and discharged wastewater per production ton. Simultaneously, the state facilitated individual environmental concerns of citizens within the controlled spheres of society. Professional and social debates over water issues increased rapidly after 1956. Due to escalating water pollution issues the water quality of the Sajó River and her tributaries was at the forefront of professional and public concern in Borsod from the end of the 1950s.

Citation:
PÁL, Viktor: Heavy Industry and its Environmental Impact in Northern Hungary between 1950 and 1980. In *Forum Historiae*, 2017, roč. 11, č. 1, s. 128-140. ISSN 1337-6861.

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