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XIX. Yüzyılın İkinci Yarısı ve XX. Yüzyılın Başında Avrupa'nın Doğu ve Batı Başkentlerindeki Ekolojik ve Çevresel Problemler: Sorunların Kaynağı, Oluşumu ve Çözüm Yolları

Öz: XIX. yüzyıl ve XX. yüzyıl başlarından itibaren Sanayi Devrimi ve endüstrileşme ile birlikte dünyanın büyük şehirlerinin kentsel alanları üzerinde ortaya çıkan göç ve teknoloji baskısı, Avrupa'nın başkentlerinde (Londra, Paris, Berlin, İstanbul, St. Petersburg) adeta kentsel ekolojik sorunları (su ve hava kirliliği, atık toplama vb.) alevlendiren bir rüzgar etkisi yarattı. Bu ise büyükşehir yönetimlerini ekolojik sorunlar alanındaki belediyecilik politikalarını değiştirmek zorunda bıraktı. Söz konusu başkentlerin her birinin kendisine has özellikleri; kentleşme ve endüstrileşme süreçlerindeki hız, belediye yönetimi ve sivil toplum gelişimi, insan hayatındaki bilim ve teknoloji çevresel ve ekolojik sorunların çözüme kavuşturulmasında yöntemler üretmektedir. Büyük Britanya'ya baktığımızda Londra çevre temizliğiyle ilgili sorunların çözümünde dengeli bir yaklaşım sergilediği görülmektedir. Lakin sanayileşme ve kentleşme hızı ekolojik problemlere yeni biçimler kazandırmıştır. Paris'in yaşanabilir bir şehir haline getirilmesi hususundaki kent yönetiminin tutarsız politikaları, öncelikli kentsel ekolojik problemlerin çözümü hususunda Fransa'ya şehir bütçesi açısından oldukça maliyetli kararlar aldırmıştır. Alman topraklarındaki bilim ve teknolojinin gelişimi ve Berlin şehir yönetiminin dikkatli tutumu, benzer sorunların çözümünde daha etkin kararların alınmasını sağlamıştır. Osmanlı İmparatorluğu İstanbul'unun coğrafi konumu ve benzersiz gelişimi, şehrin kentsel ve endüstriyel göstergeleri, onun kendine özgü sorunlarını (su teminin/kaynakları ve kalitesi) beraberinde getirirken kirliliğin de tehdit düzeyinde olmamasını sağlamıştır. Bunların aksine Rusya İmparatorluğu'nun başkent St. Petersburg'daki ekolojik problemleri göz ardı etmesi, I. Dünya Savaşı ve Devrim sırasında Rusya'yı büyük şehirlerde baş gösteren çaplı kentsel krizlerle yüzleşmek zorunda bırakmıştır.
Anahtar Kelimeler: Kentsel ekoloji, kanalizasyon, su kaynakları, kirlilik, atık toplama.

East and West Capitals of Europe in Case of Ecological and Environmental Problems of the Second Part 19th - Beginning Of 20th Century: Manifestation, Genesis and Ways of Solvation

Abstract: Migration and technological pressure on the urban space of the biggest cities of the world of 19th century, European capitals (London, Paris, Berlin, Istanbul, St.-Petersburg) in the period of industrial revolution 19th – beginning of 20th century caused the strike of urban ecological problems (water and air pollution, living space sanitation), putting metropolitan authorities before necessity of the rapid changes and reforms at this sphere. The unique features of each of these capitals depends upon the rate of urbanization and industrialization process, development of municipal government and civil society, science and technology in public life produces the way of salvation of the environmental and ecological problems. The situation insanity of London UK provided a balanced approach to the solution of some of it, but the rate of urbanization and industrial revolution gives new forms of ecological problems. Inconsistency of city government politics in inconsistency of city government in Paris, France, made the solution

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of the first urban ecological problems very expensive for the cities budget. The development of science and technology in German lands and the attention of the metropolitan authorities of Berlin made the solution the most effective. The unique development of Istanbul, the Ottoman Empire, its urban and industrial rates, gives its specific problems (water supply and it's quality) and contributed to the absence of threatening levels of pollution. As the opposite, delaying the decision of the environmental and ecological problems in St.-Petersburg, the Russian empire, contributed the biggest urban crisis, which situated in the biggest city of Russia at the First World War and revolution.

Keywords: Urban ecology, sewage, water supply, pollution, sanity.

Introduction

The completion of the industrial revolution and the growing pace of industrialization in Europe and Russia at the end of the 19th century most clearly reflected in the example of urban space. The active growth of the urban population due to the expansion of new proposals of labor in large human concentrations, the active introduction of technological innovations in the urban infrastructure, the labor and entrepreneurial life of cities significantly transform the face of the world's leading capitals. The production and economic functions of the first cities as industrial, commercial and business centers of the emerging world economic system are coming to the fore. The second half of XIX - early. XX century is a period of intense urbanization in Europe. The population of London doubled (from 3.9 million people to 7.3 million), Paris - increased 1.5 times (from 2.5 to 4 million), Berlin - 4 times (800.000 to 3.2 million), Istanbul - 3 times (from 300,000 to almost 1 million), St. Petersburg - 3.5 to 4 times (from 500,000 to almost 2 million). In terms of population at the beginning of the XX century. London, Paris, Berlin were among the top five largest cities in the world, Istanbul and St. Petersburg among the top ten.[1]

The galloping rates of migration growth and technological onslaught on the urban space environment, which were the result of the expanding processes of urbanization and industrialization, contributed to the emergence and aggravation of sanitary and environmental problems in world capitals. The increasing level of domestic and industrial pollution of urban space in the XIX - early XX centuries found expression in the mass mortality of the urban population from spreading epidemic diseases (cholera, typhoid, dysentery, tuberculosis), the nature of which was directly related to the state of the environment and urban space practiced by sanitary and technical and daily hygienic measures. The crowding of living mass of people in confined spaces give rise to the natural attendant difficulties of their existence: problems with quality water supply, with the cleansing of work and living places from industrial and household sewage. The most pressing and visible urban environmental problem by the mid-nineteenth century there was pollution of

[1] *Entsiklopedicheskiy slovar'F.A.Brokgauza i I.A.Yefrona*. (St-Petersburg.: Terra, 1992) Vol.34, 951: Vol.44, 804-805; Vol.6, 549; Vol..41, 437; Vol.76, 823; Vol.14, 621; Vol.65, 421; Vol.45, 101; Vol. 70, 732; Vol.38, 931; Z. Çelik *The Remaking of Istanbul: Portrait of an Ottoman City in the Nineteenth Century* (Los-Angeles: University of California Press, 1986), 37-38; A. Inceoglu and I. Yurekli, 1Urban Transformation in Istanbul: potential for better city" (Her Conference. 5-8 July 2011., Toulaise: 2011), 1.

the inland waters of the capitals — rivers, canals, lakes, ponds, water pools, etc.

Uncontrolled use of urban water resources for the needs of an industry that complicates its technological cycle (primarily for waste flow of waste water and fluids), flow into rivers habitually used as the main drinking resource for the population, domestic runoff of sewage in spontaneously expanding living space of European capitals worsened their condition in the capitals. Technological or logistic lag in the creation of costly systems of capital water supply and sewage at that time, the preservation of old practices of sewage disposal of urban space, removal of debris and cleaning of street and residential spaces, contributed to the deterioration of the ecology of capitals, clearly manifested in the form of natural epidemic outbreaks of deadly diseases that are closely related to sanitary and environmental condition of the surrounding space. In the capitals and densely populated centers of industrialized countries, the epidemics were in the nature of these regional disasters: cholera epidemics in London (1832, 1848, 1854, 1866), Paris (1832, 1848, 1854, 1870, 1893-94), Istanbul (1831, 1848, 1855, 1865, 1871, 1893-94), St. Petersburg (1830, 1848, 1854, 1866, 1892-94, 1908-1909), and also typhoid fever (London, 1837; St. Petersburg, 1901, 1916), in a short period of time, many thousands of citizens lost their lives, sometimes threatening the uninterrupted realization of the production and management functions of the capital centers, contributed to the strengthening of in the capital society.

Urban Pollution of London 19th – Beginning of 20th Century: The Increasing and Mutative Process

Beginning in 1815, the unrestricted flow of industrial and household waste from the one and a half million British capital of London to the river Thames, along with a decentralized system of city water supply and drainage, lack of clear rules in the logistics of the location of industrial enterprises in the urban and suburban metropolis of the city leads to a sharp pollution of the river with flowing hence the problems of high-quality water supply for citizens, which are sometimes of a scandalous nature (water intake in places of sewage and industrial effluents), which is draw attention to state expert commissions of municipal and royal subordination (1828, 1839, 1842, 1848, 1852).[2] Thames in London began to be called the "black river" because of the change in the color of its water from household and industrial emissions. Since the 1840s

[2] A. Hardy, "Water and the Search for Public Health in London in the Eighteenth and Nineteenth Centuries". *Journal of Medical History*, vol.28 (1984): 260-62.

unsolved problems of sewage and sewage disposal of urban spaces leads to the fact that London is literally drowning in its own sewage. This was especially true for the densely populated working outskirts of the southwestern and eastern right-bank districts of the city adjacent to the river delta - Bettersey, Shordich, East End, Bradford, which also served as large concentrations of textile, woodworking, chemical industries, and built-in port infrastructure. The legislative and municipal regulation of water supply practices and sewage disposal of the largest city in the world in favor of epidemic manifestations in favor of new technologies (banning cesspools in favor of drainage into rivers - in 1839, 1848; installing water closets in housing bathrooms; setting rules and specifying safe places water intake for water pipelines in the districts of the city, cleaning, filtering the water supplied to consumers - in 1852), though initially worsened the environmental situation in the city (which clearly manifested during the cholera epidemic of 1854 and during the heat wave of summer 1858, has received the nickname of London's "Great Stink"), but in the construction in 1859-1874 central citywide sewer system by engineer J. Bazaldgette, designed to harmonize the process of removing all urban runoff with tidal currents of the Thames, significantly mitigate the problems of water pollution in the city.[3] The adoption of legislative acts at the national level on the protection of the water basin of the River Thames and tributaries from pollution contributed to this (river Thames - 1856, with additions 1864, 1866, 1883; Li river - 1868, Mersey and Ayrvel rivers in 1892)[4] the prohibition and strict regulation of the industrial use of the waters of the urban basin and of the emissions of enterprises into reservoirs, undertaken by special and municipal bodies.[5]

Despite the fact that the sanitary situation of London after the opening of the central sewage system by the 1870s the most acute epidemic consequences are generally being removed from the agenda of the capital of Britain, the spectrum of environmental problems is expanding due to the influence of an industrial factor — increased air pollution in the form of factory smog (which attracted attention from 1840-50s, reached critical level in the late 1880s early 1900s.)[6] as well as contamination of public spaces due to old refining practices.

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[3] St. Halliday, *The Great Stink of London: Sir Joseph Bazalgette and the Cleansing of the Victorian Metropolis*, (Stroud: History Press Limited, 2013).

[4] G.V. Khlopin, *Zagryazneniye protochnykh vod khozyaystvennymi i fabrichnymi otbrosami i mery k yego ustraneniyu*. (Yur'yev: Tip. K. Mattisena, 1902), 101.

[5] K.H. Klaut, *Istoriya Londona*. (Moscow: Izd. Ves' mir, 2002), 94-95.

[6] Th. Miller *Picturesque Sketches of London: Past and Present. (*London, "Robson, Levey & Franklyn printed", 1852), pp.245-246; V. Heggie "Over 200 years of deadly London air: smogs, fogs, and

Despite the adoption of legislative measures aimed at limiting air pollution by smoke (1853), prohibitive measures in relation to the location of urban enterprises (primarily gas processing and chemical in 1875), progressive air pollution is becoming the most acute problem for the capital of Great Britain.[7]

In 1892, the daily amount of house waste in London reached 701,300 tons, which in terms of one person corresponded to 500 grams daily.[8] By the beginning of the XX century cleaning practices are changing in the metropolitan area of London: municipal solid waste collection is introduced, the introduction of private (at enterprises, residential buildings), as well as municipal waste incineration practices based on new technologies - by 1907 in London, primarily in the working areas of mass development 7 incinerators, however, did not always make processing without damage to the air.[9] Water supply throughout 1820-1900, carried out by private companies and pumping stations undergoes monopolization and municipalization, which contributes to the development of the urban water supply network.[10]

Urban Pollution and Its Solution in Paris in the Middle of 19th – Beginning of 20th Century: Double Prizes for the One Goal

The actualization of the environmental problem of water pollution in Paris, which declared itself at the end of the 18th century, was resolved only by the efforts of the central authorities in the middle of the 19th century, under the influence of high mortality from cholera epidemics (1832 - 16.000; 1848 - 14.000).[11] Water supply and the creation of a sewage system on fundamentally different bases in the French capital Paris in the rule of the emperor Napoleon III were organized thanks to the talent of engineer M. Belgrand and

pea soupers", *The Guardian*, 9 December 2016. URL: https://www.theguardian.com/science/the-h-word/2016/dec/09/pollution-air-london-smogs-fogs-pea-soupers. (29.07.2019 accessed data)

[7] Heggie, "Over 200 years of deadly…"; M. Pokrovskaya, *Sanitarnyy nadzor nad zhilishchami i sanitarnaya organizatsiya v razlichnykh gosudarstvakh*. (St-Petersburg: Tip. P.Soykina, 1897), 49.

[8] F.F. Erisman, *Szhiganiye i obezvrezhivaniye musora (domovogo i ulichnogo sora)* (St-Petersburg: 1900), 2-3.

[9] Ibid, 11; Z.G. Frenkel', *Zapiski i vospominaniya o proydennom zhiznennom puti* (St-Petersburg: Nestor-Istoriya, 2009), 255.

[10] F.A. Danilov, *Munitsipalizatsiya promyshlennykh predpriyatiy, zemel'nykh ploshchadey, izgotovleniya i dostavki glavneyshikh predmetov potrebleniya (Munitsipal'nyy sotsializm)* (Moscow: Tip. F. Burche, 1907), 28.

[11] P.-D. Boudriot "Lesé gouts de Paris aux XVI Ieet XVIII esiècles. Le shumeurs de la villepréindustrielle", *Histoire, économie e tsociété.* Vol. 9, no 2. (1990): 197-211; V.A. Mil'china, *Parizh 1814-1848 gg.: povsednevnaya zhizn'* (Moscow: Novoye literaturnoye obozreniye, 2013), 89.

implemented in the 1860s. in the framework of the program of radical redevelopment and reorganization of Paris by Baron J. Osman, under the slogan "a modern industrial city - a modern urban infrastructure". Two water supply networks (one with spring water and two artesian wells — for dwellings, the other for industrial needs) with a total length of 2067 km, sewage, with partial filtration, with underground canals, which are real "underground boulevards".[12] Despite the high cost and professionalism of building a water supply and sewage network with advanced engineering personnel, the municipality of Paris at that stage failed to comprehensively solve the problem of increasing water pollution in the city, which was later repeatedly confirmed by expert municipal commissions that fixed increasing pollution levels. Seine after the introduction of the citywide network of water utilities (1874, 1882, 1894). This was largely due to the fact that the municipality of Paris retained the possibility of homeowners and industrialists using alternative methods of disposal of urban space (saving cesspools for the commercial sale of sewage for fertilizer factories),[13] leaving the choice of cleaning practices for home owners and businesses between the sewer network or private operators. The use of city fees for connection to sewage networks and high prices for the implementation of water supply to residential houses and industrial enterprises in the absence of binding municipal rules of a single standard also served as an obstacle to the effectiveness of combating pollution of the capital's waters. In addition, the first primitive treatment facilities of the Parisian sewer network — irrigation fields — could not master the entire volume of urban sewage sent to them, and were also not equipped with integrated drainage, filtration and purification, which led to waterlogging in suburban areas where sewage was released (terrain Genevile near Paris).[14] This was especially true for the sites of concentrated discharge of sewage into the Seine-Clichy River, as well as for the places of factory processing of sewage into fertilizers - Bondi. The half-heartedness of the measures required new solutions and new costs for the metropolitan municipality. In 1892, the city government of Paris, with a view to "clearing the Seine", developed a project to divert all of Paris's wastewater into irrigation fields. According to the law of July 10, 1894, the essence of which was briefly designated: "All to the drains, nothing to the Seine!" on assignment of all sewage to irrigation fields. In addition, according to the

[12] Pokrovskaya, *Sanitarnyy nadzor,* 16.

[13] F.F. Erisman, *Razlichnyye sposoby udaleniya nechistot iz naselennykh mest po otnosheniyu k ozdorovleniyu gorodov.* (St-Petersburg: Tip. M. Stasyulevicha, 1875), 80.

[14] Khlopin, *Zagryazneniye protochnykh vod,* 30-31.

same law, all private houses and industrial enterprises of the city were obliged to be connected to the city sewers without fail, otherwise they would be fined.[15] According to the testimony of the deputies of the Paris municipality of 1897, "three years after the creation of irrigation fields, fish appeared even higher than Chatou in the Seine, together with this, gulls returned to the river".[16]

As in London, the range of environmental problems continued to expand due to the influence of the industrial and industrial factor in the development of the capital of France, which had declared itself since the 1840s, primarily associated with heating coal heating, concentration in the city of chemical enterprises (Zhavel regions, Passy, Panten, Belleville) and transport and engineering complex.[17]

More acutely before the Paris authorities and residents faced the problem of removal of garbage from the capital. Despite repeated city orders to improve the disposal of urban space (the laws of 1799, 1859 imposing responsibility for cleaning the streets on the police or the prefecture), the lack of an integrated system of waste disposal led to the fact that waste and sewage were simply thrown onto the streets, or focused on random spaces. The interest of a whole corporation of cesspool sweepers (from grassroppers of the urban poor to producers of agricultural fertilizers) and their opposition made the elimination of city dumps extremely difficult (the main city dump of the Monfocon district was liquidated only in 1849).[18] The hot summer of 1880 led to the widespread distribution of garbage stench in the streets of central Paris from uncleaned sewage. Under pressure from public opinion, the Parisian magistrates demanded that the authorities convert coercion to sweep the streets and dispose of house waste into a municipal tax imposed on all householders. Together with the establishment of a waste disposal tax, adopted in March 1883, November 24, 1883 by a decree of the prefect of Seine E. Pubel, in Paris, the collection of solid waste of household garbage into containers was introduced (by the name of the prefect, the nickname of a household garbage container). In the 1890s the population of Paris produced up to 603.1 thousand tons of household solid garbage daily, 4 waste

[15] *Recueil des travaux du Comite consultative d'Higiene publique de France*. *Vol.28*. (Melon, Imprimerie administrative, 1894), 374; M. Launay, *Les Champs d'epandage de la ville de Paris, Revue d'Higiene* (Paris: 1897), 1065.
[16] Ibid, 1076.
[17] Mil'china, *Parizh 1814-1848 gg*, 332-336.
[18] Ibid, 498-504.

incineration plants were also built in the vicinity (the first in 1893).[19] Thus, by the beginning of the 20th century, the events of the Paris municipality, which were very expensive for city finances as a whole, due to their chaotic and uncoordinated expenses, also, by and large, managed to reduce the severity of epidemic manifestations among city dwellers; with new technological conditions.

Urban Improvement of Berlin in Case of Environment: Rationality in Urbanistic Perspective

Timely measures for hydrotechnical equipment of the capital of Germany Berlin, which were held in 1860-1894. on the projects of D. Hobrecht, a civil engineer with the participation of the world-famous hygienist scientist R. Virkhov, which largely contributed to the reduction of municipal expenditures for the disposal of the city. The widespread practical application of scientific approaches contributed to the introduction of Berlin's capital administration, albeit costly but efficient water supply and sewage practices: artesian water supply and discharge of sewage to irrigation fields and integrated filtration contributed to the absence of massive epidemic problems familiar to other world capitals and cities of Germany (Hamburg, 1892). The construction of a sewage system with integrated treatment of wastewater to irrigation fields contributed to a radical improvement in the state of the r. Spree, according to studies of 1863 and 1870. who recorded increasing pollution of its water flow, but already in 1892 they noted "a significant improvement in its condition".[20] Nevertheless, the general pollution of water resources continued to progress in the capital of the German Empire: in 1910, the Berlin water supply system was forced to change the source of water supply, because the previous one - the system of the Zurich lakes near Berlin turned out to be polluted and unsuitable for drinking.[21] Integrated water supply and sewerage measures, focused on the organization of artesian water supply and aeration of impure drains in cities of German lands by the beginning of the XX century. managed to almost completely eliminate the

[19] K. Sil'gi, *Istoriya musora. Ot Srednikh Vekov do nashikh dney. Kratkiy kurs* (Moscow: Tekst, 2011); *Kopiya raporta prezidenta goroda Warshavi V.V. Bibikova Warshavskomu general-gubernatoru Chertkovu M.I. o proyekte musoroszhigatel'nogo zavoda v Varshave. 1903,* Russian State Historical Archive, F.1287. Op.28, 1902, D.637, 13 opp.

[20] Khlopin, *Zagryazneniye protochnykh vod,* 33-34.

[21] G.V. Khlopin, *Materialy po ozdorovleniyu Rossii. Sanitarnoye opisaniye Astrakhani, Samary, Saratova, Tsaritsyna s ukazaniyem mer, neobkhodimykh dlya ikh ozdorovleniya* (St-Petersburg: Tip. MVD, 1911), 164.

epidemic nature of cholera, typhoid and dysentery diseases in the city. There is a sharp drop in the incidence of typhoid fever: in Berlin - from 96 people / 100.000 inhabitants. in the beginning. 1870s - up to 5.9 people in the beginning. 1900s, in Vienna from 221 - up to 6 people. If in St. Petersburg in the period 1870-1906. from typhoid fever, from the 1880s. which had a recurrent epidemic in the city, 36.989 people died, in Vienna - 6.930, in Berlin - 3061 (1870-1890).[22]

Urban Environment of Istanbul of the Second Part of 19th Beginning of the 20th Century and its Specifics

Slow rates of industrial development of the Ottoman Empire in the middle and late XIX centuries in comparison with the countries of Western Europe and Russia, affecting a more moderate pace of urbanization and the growth of the industrial base in cities; systemic difficulties in adapting the model of the Ottoman society to the economic, politic, scientific and legal system of relationships and practices adopted in Europe and their forced planting during the Tanzimat reform period; the start of new, modernized areas of urban society (healthcare, transport, industry, municipal economy) on a narrow stratum of foreign experts and their associations; the traditional vector of development of the capital of the empire, first of all, as a transit center for the Mediterranean trade contributed to slowing down the manifestation and "socialization" of the problems of the sanitary and environmental complex of the city of Istanbul. The peculiarities of the geographical factor of the location of the capital on the Bosphorus, the preservation of the highly developed Roman and Byzantine fundamentals of the pre-industrial urban infrastructure (primarily in the water supply system of aqueducts, reservoirs, etc.), the slow and non-linear increase in population and industrial base all softened the visual relevance of sanitary Istanbul's hygiene issues. The high mortality of the urban population from cholera epidemics of 1850-60s, the emergence of the first European-type medical public organizations in the Ottoman Empire, the central government's measures to reform the metropolitan administration with the participation of a foreign party contributed to increasing the attention to the problems of sanitary-epidemic properties of the early 1860s (urban water pollution, sanitation and garbage

[22] *Tablitsa o vliyanii kanalizatsii na ponizheniye smertnosti ot bryushnogo tifa. Prilozheniye k predstavleniyu Otdela narodnogo zdraviya Glavnogo upravleniya po delam mestnogo khozyaystva MVD v Gosudarstvennuyu Dumu ot 15 noyabrya 1909 g.,* Russian State Historical Archive, F. 565. Op.5. D.20397, 143 opp.-144.

collection of residential spaces)[23] as well as the first attempts of legislative regulation of these processes ("The Act of Street Regulation" of 1859 for the 6th, Galata district of Istanbul).[24] However, the partialness and caution in the reforms of the metropolitan administration on the part of the supreme authorities, the more urgent problems of urban construction, the limited financial and social base of the new government in the municipalities did not contribute to the solution of these issues.[25] However, affecting the middle of the XIX century the exhaustion of the former sources of water supply and their strong dependence on the natural and climatic features of the environment surrounding the capital of the Ottoman Empire, even at moderate population growth rates, made the issue of supplying high-quality drinking water one of the most pressing issues of the city. Since the 1860s the city authorities are taking point measures against potential pollutants of the drinking resource of the capital of the Ottoman Empire (Serbian inhabitants of the Belgrade forests in suburbs). Construction by French companies in the 1880s in the European and Asian parts of Istanbul, new water pipelines on a new technical basis contributed to increasing demands on the quantity and quality of water supplied by residents and local authorities who became permanent in 1890-1900.[26] However, the special position of the city's water companies as indisputable monopolists for the production of water services in the municipal space of the capital, the lack of technical capacity and resources for independent implementation of these measures at the Istanbul prefecture made all attempts to resolve the issue with water suppliers unsuccessful.[27] By the 1910s this includes the first separate municipal activities in Istanbul for the sewage of areas and residential areas of the city, interrupted by the war circumstances of the Italian, Balkan and First World Wars.[28] The social and

[23] Quelques mots encore sur l'hygiene publique a'Constantinopole. *Gazette médicale d'Orient*. No. 6 (1862): 3.

[24] YU.A.Petrosyan and A.R. Yusupov, *Gorod na dvukh kontinentakh (*Moscow: Nauka, Glavnaya redaktsiya vostochnoy literatury, 1977), 149;. N. Isik Demirakin, "A study of Ottoman modernization on the city: The Sixth municipal district of Istanbul (1858-1877)" (A Master's Thesis, Bilkent University, 2006), 53.

[25] Ibid, 74.

[26] YU.A.Petrosyan and A.R. Yusupov, *Gorod na dvukh kontinentakh (*Moscow: Nauka, Glavnaya redaktsiya vostochnoy literatury, 1977), 210; K. Fleet, "The provision of water to Istanbul from Terkos: continuities and change from Empire to Republic", *Middle Eastern and North African Societies in Interwar period*, compiled by E. Boyard and K. Fleet (Leiden-Boston: Brill Publ., 2018), 213.

[27] Ibid.

[28] Z. Çelik, *The Remaking of Istanbul: Portrait of an Ottoman City in the Nineteenth Century*, (Los-Angeles: University of California Press, 1986), 32.

political movements of the Ottoman Empire, legalized by the Young Turk revolution of July 3-23, 1908, begin to draw attention to the urgency of resolving the issues of the metropolitan sanitary-ecological complex.[29]

Urban and Industrial Pollution and its Solution in the St.-Petersburg the Middle of the 19th – Beginning of the 20th Century: Death Delay is Like

The beginning of the formation of a complex of sanitary and environmental problems in St. Petersburg is a little behind the leading capitals of Western Europe and dates back to the 1850-1880s. As a result of surveys conducted by city, scientific and public expert commissions in the context of the deadly cholera and plague epidemics of the capital's water arteries (1864, 1874, 1889, 1892, 1896, 1900, 1908), comprehensive surveys of the marginal and central areas of the capital (1872, 1879, 1896, 1908-1910) The Russian Empire revealed progressive pollution of the water resources of the capital, and focal air pollution in areas of industrial concentration of the city (the Aleksandro-Nevsky, Narva and Vasileostrovsky parts). In order to understand all the urgency of the environmental problems of water resources in St. Petersburg in the late XIX - early XX centuries, one should pay attention to the general quantitative indicators. In the period of 1884-96 up to 57,5 million tons of liquid sewage was released into the rivers and canals of the northern capital. The total average daily volume of liquid sewage of the metropolitan metropolis on the Neva in 1908, according to the information of the director of the sanitary engineering institute in St. Petersburg S.L. Rashkovich, was 708.414 tons, which was only 1.8 times less than the daily volume of sewage in the British capital of London, which at that time was 3.4 times larger than St. Petersburg. According to the analysis made by the doctors of the medical police of the capital of Russia, the St. Petersburg subsoil water of the sample of 1896, taken for drinking, compared with the waters of 1872, the outflow waters of the 16 largest, equipped with water closets of England (including London) turned out to be more polluted than the British, and in comparison with the total pollution of the rivers and canals of St. Petersburg - comparable.[30]

About 72% of this runoff was waste from industrial enterprises, primarily woodworking, chemical and textile industries, some of them (Baron Stieglitz's

[29] B.- G. Baykan, "Environmentalists in Turkey - Who are they?", *Heinrich Böll Stiftung. Perspectives,* No.13 (April 2013): 8.

[30] *Gorod Sankt-Peterburg s tochki zreniya meditsinskoy politsii*. Pod red. star. vracha I. Yeremeyeva, (St-Petersburg: Tip. MVD, 1897), 283.

textile factory, well-known in the city) discharged highly toxic wastewater in the immediate vicinity of the city water intake. Small rivers and canals passing through densely populated parts of the city and industrial concentration areas, as well as certain sections of the Neva delta, remained in the most polluted state. Particularly noticeable was the pollution of the Obvodny Canal, on the banks of which about 60% of the industrial enterprises of the suburban area, whose population was constantly increasing, concentrated, and its water supply was made using old methods. As a result of the progression of pollution in the Neva water area, the Malaya Nevka was sheltered, which appeared by 1890, due to the discharge of oil and oil residues from the Nobel plants on the Vyborg side and kerosene warehouses on the Petersburg side. Since the 1880s there are increasing episodic incidents of factory smog, acid and gas emissions to the atmosphere in the Obukhovsky plant, Narva and Shlisselburg parts, Cekush section, a gas factory on the Obvodny channel, which caused complaints from the population.[31]

Since the beginning of the XX century. The question of streamlining cesspool practices that differ in different directions (cesspools and drainage drains into waterways), unify and municipalize cleaning and collection activities in residential areas of the capital, and introduce standards for industrial emissions and emissions into water bodies and the atmosphere is becoming more acute. According to the calculations of the City Council of 1894, the removal of sewage from cesspools in 7 cities left-bank (southern) parts of Neva, containing about 1/5 of the city sewage, cost the city budget 4.2 million rubles a year, which was 3 times more than the cost of the same measures of all of Berlin, by that time 3 times the size of St. Petersburg.[32] The expansion of the population in the suburban areas created the need to change the location of the main urban landfills of sewage (Glukhozerskaya and Gutuyevskoy), adjacent to inhabited quarters, as well as the elimination of unauthorized temporary dumps, arranged on the eastern and southern outskirts of the capital by fecal collectors. In 1904-1912 in St. Petersburg, following the example of European capitals, a municipal assembly of

[31]*Stanovleniye revolyutsionnykh traditsiy piterskogo proletariat,* Sb. dokumentov pod red. A.N. Tsamutali. (Leningrad: Lenizdat, 1987), 248-249; V. Simanskiy, *Peterburgskiye dachnyye mesta v otnoshenii ikh zdorovosti. Vypusk 1.* (St-Petersburg: Tip. V.V. Komarova, 1881), 43; *Prosheniye Ministru finansov N.KH.Bunge ot obyvateley zavodov, prinadlezhashchikh Franko-russkomu obshchestvu i sostoyashchikh v Kolomenskoy chasti na reke Pryazhke u Berdova mosta o zagryaznenii vozdukha deystviyem pischebumazhnoy fabrikoy Pallizena v Chekushakh ot 3 oktyabrya 1885 g.,* Russian State Historical Archive, F.20. Op.3. D.2175, 27. Z. G. Frenkel', *Petrograd perioda voyny i revolyutsii: sanitarnyye usloviya i kommunal'noye blagoustroystvo,* (Petrograd: 1923), 70.

[32] *Gorod Sankt-Peterburg*, 131.

municipal solid waste — municipal waste — is being introduced; gathered with only 5% of the inhabited area, mainly from the central parts.[33]

But the most actual problem was the question of building a centralized city-wide sewage system in St. Petersburg and rebuilding the water supply system in accordance with the new sanitary and environmental features. At the beginning of the XX century. St. Petersburg remained virtually the only (except for Istanbul) the largest capital of Europe, which does not have a central city-wide sewer network, providing the sanitary and hygienic needs of a million-plus city. From 1864 to 1907, in the city duma, 8 city commissions dealt with the issue of plumbing, which examined 30 foreign and domestic sewage construction projects, but none was recognized as effective due to clashes of lobbyists' interests within self-government.[34] A rough estimate of the cost of building a citywide sewage system was estimated at 100 million rubles, going beyond the limits of the city budget.[35] Despite the strong cholera epidemic of 1908-1909 that broke out, interest in the rehabilitation of St. Petersburg from the central and supreme authorities, which in 1911 adopted a draft law coordinated with the State Duma on the possibility of state funding for the construction of sewage and water pipelines coercive measures against city owners and enterprises, private engineering and construction measures aimed at the development of and the sewerage system in the pre-revolutionary years (sewage collector on Voskresenskaya embankment, filter ozone water supply system on the Petrograd side, fecal receiver Vasileostrovskoy part) the general system of urban sewage in the beginning of the XX century in the capital of the Russian Empire was not created.[36]

Conclusion

Due to the rapid growth of the population and the complexity of the internal infrastructure of large cities in the second half of the XIX - early XX centuries. European capitals become a place of visual manifestation of the primary complex of environmental problems - complex pollution of water

[33] Z. G. Frenkel', *Petrograd perioda voyny*, 84,87; *Ob ozdorovlenii g. Sankt-Peterburga s uprazdneniyem gorodskikh svalok i pomoynykh yam v svyazi s ustroystvom musoroszhigatel'nykh stantsiy i yezhednevnym vyvozom domashnikh otbrosov. Doklad Sankt-Peterburgskoy gorodskoy dume predsedatelya gorodskoy sanitarnoy komissii doktora meditsiny A.N. Oppengeyma. 1904,* Central State Historical Archive of St.-Petersburg, F. 210. Op.1. D.192, 33.

[34] N. Astrov, "Sudba russkih gorodov", *Gorodskoe delo.* No. 2 (1911): 141-148.

[35] *Osobyye zhurnaly Soveta ministrov Rossiyskoy imperii, 1909 god* (Moscow: ROSSPEN, 2000), no. 62: 199.

[36] Frenkel', *Petrograd perioda voyny*, 77, 84, 87, 99.

and drinking resources, living space, the appearance of the first signs of industrial impact on the water and air environment of the city (smog, occasional acid rain, toxic emissions into the atmosphere). All this implied the earliest cardinal changes of existing cesspool practices, the introduction of a new technological infrastructure to facilitate the quick solution of environmental pollution problems, the creation of a new legislative base aimed at regulating the impact on the urban environment, creating a system of state, municipal and public forms of control over the environmental situation in large areas. cities-capitals of the largest countries in Europe and the world. The peculiarities of the industrial development, social, political and state structure of each of the European countries dictated their peculiarities in adapting to solving this fundamentally new set of problems of capitals, which have their pros and cons. It is worth noting that in comparison with the solution of these problems by London, Paris and Berlin by the beginning of the 20th century, St. Petersburg had a serious backlog. Despite the similar rates of urbanization with other European capitals, which only intensified in 1890-1910, as well as the similar dynamics of development and symptomatology of the first environmental problems that clearly emerged in the city by the end of the 19th century, the support of topical urban improvement activities (construction of the capital's sewage and water supply system, changing the practice of cleaning residential space) by the central government, the metropolitan city government was not in a hurry to solve them, limited to unsystematic half-measures, without much affecting established practices and stakeholders. By 1917, a unified system of urban water utilities was not created in the capital; cleaning and sewage practices sinned with a multi-vector and multidirectional direction, leading to inefficient spending of budgetary funds of the capital's management, becoming an additional expense item for the inhabitants of the capital. This clearly manifested itself in the period of gigantic testing for the metropolitan urban economy during the period of the revolution and the civil war in Russia in 1917-1922. The unresolved of the most significant problems of sanitary-ecological nature, the lack of an organized system of cleaning urban space on a new technological basis contributed to the general socio-ecological crisis of St. Petersburg-Petrograd, which was open to epidemic diseases in a complex socio-political and social period of existence, and in view of this, having undergone a process of a sharp decrease in population, becoming in fact the only world capital that has survived such recent deurbanization.

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