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The Impact of Decommissioning Cemeteries on the Urban Ecosystem

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Abstract: The decommissioning of cemeteries noticeably transforms the urban fabric. The purpose of this article was to determine what impact the decommissioning of cemeteries has on the urban ecosystem. For this purpose, it was necessary to assess the value of cemeteries within the urban ecosystem. Cemeteries are classified as urban green spaces, and their value as preservers of flora and fauna in local ecosystems has been proven. However, numerous decaying bodies in one place could have adverse effects on the environment. In order to assess the impact of transforming cemetery areas for other uses in the context of sustainable city development, it is necessary to define what these other functions might be. This article presents the main reasons for decommissioning cemeteries and links them with subsequent land use. The history of cemetery locations in five major Polish cities was analyzed to determine the extent to which cemeteries were decommissioned. In the two cities with the highest number of decommissioned cemeteries, further research was carried out in order to establish the typical land use of these former cemeteries, whether this usage is related to the size or type of the former cemetery, and whether change in land use is an advantage or a disadvantage for the urban ecosystem.

Keywords: cemeteries; cemetery decommissioning; burial site; urban greenery

Citation: Myślińska, A.; Szczepański, J.; Dłubakowski, W. The Impact of Decommissioning Cemeteries on the Urban Ecosystem. *Sustainability* **2021**, *13*, 9303. https://doi.org/10.3390/su13169303

Academic Editor: Víctor Yepes

Received: 8 July 2021
Accepted: 9 August 2021
Published: 19 August 2021

1. Introduction

Once peripheral structures, cemeteries have become part of the developing, dense urban fabric. The value of urban land now requires cemeteries to serve a variety of purposes, beyond their traditional role of being a place of disposal for dead human bodies [1]. The value of urban cemeteries is mainly associated with their cultural role [2] as representatives of private and collective memory [3], meaning that they should reflect the character of their local community [4]. They are also a part of the urban ecosystem, and this function is no less important [5]; therefore, cemeteries may be considered green spaces within cities [6]. In fact, in Polish law, planning studies, and on maps, cemetery areas are marked as greenery [7]. This should not be a surprise because contemporary cemeteries are usually designed close to nature [8], and they may even serve the additional role of acting as city gardens [9]. For a long time, philosophical deliberations on the form of cemeteries suggested that they should be designed as parks or forest-type areas in order to promote a contemplation of nature and direct thoughts toward death [10].

Cemeteries are important to urban ecosystems. Much like parks, they are essential points on city maps [11]. Moreover, research indicates that cemeteries have a beneficial effect on fauna [12] and flora biodiversity [13]. For example, studies conducted in Germany identified over 600 species of animals, insects, and plants in the areas of the examined necropolises [11]. Another advantage of cemetery spaces is their positive influence on temperature regulation in their cities. Like other green areas, cemeteries support rainwater retention [1]; they also provide noise isolation [14]. There is a range of design solutions used in cemeteries to support the pro-ecological development of a city: designing additional

hydrological facilities; selecting appropriate plantings; and increasing the water-absorbing surface, e.g., by promoting cremation, which reduces the burial site space or eliminates it completely [15]. On the contrary, cemeteries can be a source of water and ground pollution, which can be disadvantageous for an urban ecosystem.

The decommissioning of cemeteries seems to be an issue that arouses moral opposition among many [16]. Due to constantly expanding cities, the topic of decommissioning [17] or re-using cemetery space [18] arises often, and changes to the functions of cemetery sites occur regardless of the moral assessment of this practice. This research shows that, in the five examined Polish cities, former cemeteries constitute a large part of the fabric of these cities. Taking the ecological value of urban cemeteries into consideration, a question arises: What is the impact of their decommissioning on the urban ecosystem? In other words, do the disadvantages of decommissioning cemeteries outweigh the advantages? The train of thought that led to answers to the above questions began with establishing the scale of the phenomenon. This was necessary in order to reject the thesis that it occurs so rarely that it does not matter in the context of a large city. Another task involved comparing the ecological value of decommissioned cemeteries to the current ecological value of post-cemetery areas. To do this, cases of the liquidation of cemeteries were investigated, and it was discovered that there are connections between the conditions in which a cemetery was liquidated and the current land development. The results of this research clarify whether the decommissioning of cemeteries has a negative impact on the urban ecosystem, or if it is a good way to ensure sustainable city development.

2. Materials and Methods

2.1. Study of the Scale of Cemetery Decommissioning

This research on cemeteries in Poland concerned five large cities: Lublin, Gdansk, Krakow, Warsaw, and Wroclaw. All existing and defunct cemeteries within the present administrative borders of these cities were analyzed. The source materials regarding cemeteries included books, articles, maps, and information found online. In total, 387 cemeteries were analyzed.

2.2. Study of the Historical Context of Cemetery Decommissioning

This research included finding the reasons behind the decommissioning of cemeteries within the five Polish cities. Conclusions were drawn on the basis of the location of the cemetery in relation to the city development during its decommissioning, the time of its establishment and liquidation, and additional information found in the literature.

2.3. Study of the Current Land Use

Gdansk and Wroclaw, being the cities with the highest number of decommissioned cemeteries, were studied further. The data on the former cemetery plot locations and sizes, which were essential for establishing current land use, came from the research described below and the available literature on the subject. Information on the boundaries of decommissioned cemeteries was found on historical maps and compared to the existing conditions. In some cases, the former geodetic divisions of plots are still preserved, for example, the cemeteries that currently compose Park Skowroni in Wroclaw. If there was no mention of a defunct cemetery site in the literature, its size was determined using interactive geodetic maps on Geoportal [19], where the plot size information is available. When the present divisions of plots did not correspond to the former cemetery sites, their areas were estimated using measuring tools on digital maps with a satellite background, taking into account the locations of old trees and the proportions of roads and buildings in the area. It is impossible to estimate the size of defunct cemeteries, even though efforts were made to determine them as precisely as possible, and the analyzed data are thus approximate.

In the place of decommissioned cemeteries, there are various types of buildings, areas of road, tracks or pedestrian traffic, and other types of green areas, such as parks, forests, or undeveloped green areas. The current development of the former cemetery sites was

determined using satellite images on Google Maps [20] and Geoportal [19] maps. In cases where there were several types of development in a given area, the prevailing one was chosen.

3. Results

3.1. Decommissioning Urban Cemeteries in Large Polish Cities—The Scale of the Phenomenon

In each of the researched cities, there are many examples of decommissioning cemeteries. The data presented below, in Table 1, are a summary of the information gathered from books, articles, maps, and information found online, and show the scale of the phenomenon, indicating that it can be a factor contributing to the changing of the urban ecosystem.

Table 1. Established and decommissioned cemeteries in Gdansk, Wroclaw, Warsaw, Lublin, and Krakow.

City	Total Cemeteries Established	Decommissioned Cemeteries
Gdansk	101	78
Wroclaw	137	104
Warsaw	57	8
Lublin	30	13
Krakow	70	27

3.2. Historical Context of Cemetery Decommission

The research indicates that there were three main reasons for decommissioning cemeteries in the analyzed cities, as outlined below.

3.2.1. Decommissioning of Cemeteries inside the City at the End of the 18th and the Beginning of the 19th Centuries

At the end of the 18th century, in Western Christian countries, many cemeteries, and mainly churchyards, were removed from dense urban areas. For example, in Paris, which was the birthplace of this phenomenon, Holy Innocents' Cemetery was moved to Calmart in 1780, and the Cimetière Sainte-Marguerite was moved to Père-Lachaise [21]. In Gdansk, there were 9 decommissioned or relocated cemeteries; in Krakow, there were 14; in Lublin, there were 4; in Warsaw, there were 4; and in Wroclaw, there were 9. Decisions regarding their relocation or complete decommissioning were related to the trend initiated by Parisian medics, who linked the lack of hygiene caused by living close to overcrowded cemeteries with shallow graves containing smelling bodies with the poor health of the inhabitants of the French capital [21].

At first, the urban population was reluctant to bury their relatives away from their place of residence. Finally, however, a compelling argument favoring burials outside the city walls was the inconvenience associated with the foul odor that lingered near city cemeteries [22].

Rapidly developing European cities, including Polish ones, involved an increasing number of deceased bodies. As a result, the introduction of a ban on burying the dead within the city walls took place in all major cities, including the ones discussed: Lublin in 1792 [23], Gdansk in 1816 [24], Krakow in 1792 [22], Warsaw in 1795 [25], and Wroclaw in 1775 [26].

Fifty years after introducing new legal acts, four cemeteries were decommissioned in Lublin, with three new ones established outside the city during this period. In Gdansk, 4 cemeteries were decommissioned, but the number of existing necropolises increased from 28 to 44; meanwhile, in Krakow, 18 cemeteries were decommissioned, and the number of existing cemeteries in this city decreased from 24 to 17. It is worth mentioning that the newly established necropolises were much larger than the shutdown churchyards. Additionally, 2 cemeteries in Warsaw were decommissioned, and, along with the newly created ones, 50 years after introducing a ban on burying the dead inside the city, there

were 20 cemeteries in the Polish capital. In Wroclaw, 7 cemeteries were decommissioned, while there were 37 necropolises present 50 years after the legal acts came into force.

The increase in the number and area of necropolises was primarily related to the manner of burying the dead. Until then, burghers were buried in churches and churchyard cemeteries, but, unlike today, the use of a separate grave for each corpse was not practiced. Rarely there were tombs located in the cemetery. The dead were buried in shallow, unmarked graves in very densely built-up cities, hence the odor. Occasionally, the bones of the dead were dug up and placed in charnel houses. In this way, many of the dead could be accommodated in a very small space. The reform that started in France changed the location of cemeteries and the way the dead were buried—in separate graves. This resulted in the need for continuous expansion of burial sites [21].

3.2.2. Decommissioning of Cemeteries Resulting from the Change of the Population Living in the City

Although legal changes at the end of the 18th century and early 19th century contributed to the closure and construction of many cemeteries, the decommissioning of a much larger number of necropolises resulted from the change of Polish borders after World War II. Population changes in the examined cities are presented below:

- The biggest national group in Lublin in the pre-war years were the Poles. In 1931, 65.5% of Lublin residents declared Polish as their mother tongue; 33.9% were Jewish and spoke Hebrew [27].
- The biggest national group in Gdansk in the years 1920–1939 comprised Germans. According to the 1923 census, they constituted 95% of the population [28].
- In Krakow, according to the census of 1921, 84% of the city inhabitants declared Polish nationality.
- The biggest national group in Warsaw in the pre-war years comprised Poles. In 1931, 72% of Warsaw residents declared Polish as their mother tongue; 27% were Jewish and spoke Hebrew [29].
- The biggest national group in pre-war Wroclaw comprised Germans. According to the 1910 census, 95.71% of the population declared German as their mother tongue.

Currently, all of the analyzed cities have less than 20% of inhabitants belonging to a national or ethnic minority. The above data show that the main changes in the population structure took place in the cities annexed to Poland after World War II—Wroclaw and Gdansk. The population, in both cases primarily German, was displaced or moved to other areas and replaced by Poles [30]. In these cities, inhabited by a new group of residents, the largest numbers of cemeteries were decommissioned. Table 2 shows the relationship between the decommissioning of cemeteries and the change in the population of a given city. Since World War II, 52 cemeteries have been decommissioned in Gdansk and 71 in Wroclaw. For comparison, only four cemeteries have been decommissioned in Lublin, two in Krakow, and three in Warsaw in the same period.

Many consider the decommissioning of German cemeteries after World War II immoral, and some even call it infamous. As Pilarczyk mentioned in her article about methods of commemorating former cemeteries in Poland, the commemorative facilities created to mark decommissioned cemeteries are a form of apology and redemption commemoration [31]. Nevertheless, the communist authorities encouraged the decommissioning of German cemeteries, and necessary legal acts were introduced to facilitate this. Naturally, such regulations were not applied to the areas where Soviet or Russian soldiers were buried, so that one can point to their political dimension. However, it should be noted that there were only a few Soviet cemeteries in the examined cities.

The poverty prevailing in Poland after the war and the still vivid memory of the harm caused by Germans did not foster willingness to maintain those necropolises where the recent aggressors were buried.

In Lublin, Krakow, and Warsaw, a similar trend can also be noticed, but on a much smaller scale. The abandonment of cemeteries was connected with both the nationality and the religious affiliation of people whose population would decrease in the city.

Table 2. Quantitative status of cemeteries: 1—when the law prohibiting burying the dead in urban areas was introduced, 2—50 years after the law prohibiting burying the dead in urban areas was introduced, 3—on the eve of World War II, and 4—today.

	Year	Existing Cemeteries	Decommissioned Cemeteries	% of Decommissioned Cemeteries	Total
Lublin					
1	1792	11	3	21%	14
2	1842	14	7	33%	21
3	1939	19	8	30%	27
4	2021	17	13	43%	30
Gdansk					
1	1816	28	16	36%	44
2	1866	44	20	31%	64
3	1939	70	26	27%	96
4	2021	23	**78**	**77%**	101
Krakow					
1	1792	24	6	20%	30
2	1842	17	24	59%	41
3	1939	39	25	39%	64
4	2021	43	27	39%	70
Warsaw					
1	1795	14	0	0%	14
2	1845	20	2	9%	22
3	1939	43	5	10%	48
4	2021	49	8	14%	57
Wroclaw					
1	1775	25	6	19%	31
2	1825	37	13	26%	50
3	1939	91	33	27%	124
4	2021	33	**104**	**76%**	137

3.2.3. Decommissioning of Cemeteries Resulting from a Collision with the City Development

Another reason for the decommissioning of cemeteries is their interference with some other function. According to the research conducted by the authors, cemeteries are always planned in undeveloped areas—no exceptions to this rule were found in the studied cities. It happens, however, that their function begins to collide with the natural development of the urban area, and they are reduced or decommissioned to make room for other investment projects. Examples of cemeteries decommissioned for this reason are presented in the Table 3.

Table 3. The most common features of decommissioned cemeteries in relation to the reasons for their decommissioning.

Reasons for Decommissioning	Decommissioning of Cemeteries inside the City at the End of the 18th Century and the Beginning of the 19th Century	Decommissioning of Cemeteries Resulting from the Change of the Population Living in the City	Decommissioning of Cemeteries Resulting from a Collision with the City Development
Who was buried in the cemetery?	Townspeople, excluding the rich, who were buried in churches	Former inhabitants of the city and soldiers fighting abroad	Victims of an epidemic, suicides, and dissenters
The size of the cemetery	Mainly small churchyards	Cemeteries of various sizes	Mainly small cemeteries
What is the new purpose of the former cemetery grounds?	Usually small squares or lawns	Parks, often with some small form of commemoration of the original function of the site	Buildings of communication routes
The condition of the cemetery at the time of its decommissioning	Overcrowded, giving off a stench	Cemeteries in good condition	Cemeteries often located in exposed places in the urban fabric—usually, but not always: a forgotten, neglected cemetery.
Examples from Warsaw	Evangelical Cemetery, Świętokrzyski Cemetery, Bridget Cemetery, and Carmelite Cemetery	Old Believers' Cemetery in Kamionek	Choleric Cemetery and Gorzkiewki Cemetery
Examples from Gdansk	Cemeteries in the historic city center	Cemeteries by Wielka Aleja, New Catholic Cemetery, Old Catholic Cemetery, Cemetery in Wiśloujście, Evangelical Cemetery in Nowy Port, Catholic Old St. Jadwiga, Strzyża Dolna, Evangelical Cemetery in Sobieszewo, Brzeźno, and Savior Cemetery	Cemeteries at 3 Maja street, the Cemetery in Ostrów
Examples from Wroclaw	Cemeteries in the historic city center	Defunct cemeteries in the area of the present Skowroni Park, defunct Gabishnian cemeteries, and defunct cemeteries in the area of today's West Park	New cemetery of St. Maurice (part I), new cemetery of St. Maurice (part II), cemetery in Huby, and cemetery in Gaj II
Examples from Lublin	Cemeteries in the historic city center	Ukrainian Greek Catholic Cemetery	War cemetery at Nowy Świat street

3.2.4. Summary of the Collected Data on the Decommissioning of Cemeteries

The authors researched decommissioned cemeteries in the given cities. The analysis of the collected data shows certain trends, which are presented in Table 3.

Of the three reasons mentioned above for decommissioning cemeteries in the examined Polish cities, population change was by far the most frequent. Moreover, according to the analyses, assigning the cemetery site a new non-cemetery function was much more frequent if relatives of the entombed did not live nearby anymore. This is confirmed by the data from Table 2 and Section 3.2.2. In the cities where the nationality of the population changed the most after World War II, the number of decommissioned cemeteries in the post-war years was the biggest.

3.3. Current Land Use Study

The three types of land use that can be found in post-cemetery areas are buildings, land use related to transportation (pedestrians, roads, and railway tracks), and land use

related to different forms of greenery (forests, parks, unmanaged greenery, and other cemeteries, i.e., when one cemetery was decommissioned and the majority of its area is now another cemetery).

The area and current land use of the defunct cemeteries in Gdansk and Wroclaw, the cities with the largest number of such cemeteries, were examined. The collected data are presented in Table 4.

Table 4. A list of the new functions of former cemetery sites.

Type of Current Land Use		Gdansk		Wroclaw	
		Number of Cemeteries	Area (ha)	Number of Cemeteries	Area (ha)
Buildings		17	~7.8	28	~26.7
Transport	Roads (including car parks)	12	~3.6	12	~10.4
	Pedestrian (including squares)	5	~1.8	12	~3
	Railway tracks	1	~0.1	0	0
Greenery	Forests	1	~1.2	2	~0.4
	Parks	16	~35.3	32	~115.5
	Unmanaged greenery	9	~8.4	14	~9.5
	Other cemeteries	2	~2.5	0	0

As shown in Table 5, in Gdansk and Wroclaw, the largest number of former cemetery sites were converted to parks and buildings, with the majority of the total area of land was converted into parks. In total, 78% of the area of former cemetery sites in Gdansk was transformed into green areas: 28 defunct cemeteries with a total area of 47.4 ha. In Wroclaw, 76% of the decommissioned cemetery grounds was transformed into green areas: 48 cemeteries with a total area of 125.4 ha.

Table 5. Summary data on the new land use of former cemetery sites.

City	Function Type	Number of Cemeteries	Area (ha)	% (area)
Gdansk	Buildings	23	7.8	13%
	Transport	27	5.5	9%
	Greenery	28	47.4	78%
Wroclaw	Buildings	28	26.7	16%
	Transport	24	13.4	8%
	Greenery	48	125.4	76%

The cemeteries that were decommissioned for various types of building or transport facility projects were, in most cases, small. In Gdansk, the largest cemetery in this group had an area of approximately 1.31 ha, and the average area of decommissioned cemeteries did not exceed 0.4 ha. In Wroclaw, the largest cemetery was 7.5 ha, and the average area of decommissioned cemeteries replaced with buildings or transport facilities was 0.7 ha.

In Gdansk, 15 out of the 50 decommissioned cemeteries intended for various investment projects were located in the old town or its proximity, while in Wroclaw, it was 17 out of 52. These were small churchyards that had a negative impact on the health of the city inhabitants.

The reasons for decommissioning only small cemeteries for building or transport facility projects can be attributed to the fact that the decommissioning of cemeteries is still strongly opposed on a moral level. Transforming them into facilities such as shopping centers or residential buildings seems unacceptable, even if the cemetery is neglected and the graves abandoned [32]. The aforementioned opposition to the decommissioning of cemeteries is confirmed by interviews with the inhabitants of the area where post-German cemeteries were located [33], contemporary protests against investing in former

cemeteries [34], and own experiences—a statement from the author's grandfather, who witnessed the liquidation of former German cemeteries in Gdansk.

The removal of graves, with the potential exhumation of remains and the transformation of the cemetery to a park or green space, still allows for enjoying nature, which, as mentioned in the introduction, is a catalyst for remembering the dead and reflecting on life after death. If a former cemetery site is commemorated in some way, visitors can feel the spirit of the place with a bit of help from their imagination.

4. Discussion

4.1. What Is the Impact of Cemeteries on the Environment?

Cemetery sites may have a negative impact on the environment. There is a link between the existence of a cemetery in the area and groundwater [35] and soil pollution [36]. Some researchers say that all cemeteries may cause harm to the environment, and in fact, many studies have confirmed this negative impact [37].

That being said, it is worth mentioning that some studies on this subject have been inconclusive [38]. Additionally, since the process of body decay depends on many factors, such as the local environment or the embalming process to which the bodies of the dead were subjected [39], it is impossible to determine if all cemeteries pollute the environment.

After cemetery decommissioning, the diversity of plant species may decrease, mainly those planted individually at the graves [13], even if research indicates that the most popular woody plant in cemeteries is the common thuja [40]. For example, in Gdansk, only larger trees are left in the parks occupying former cemetery sites, planted along the main avenues of the necropolis (Figure 1).

Figure 1. A park in the vicinity of the Gdańsk University of Technology occupying a former cemetery site.

The authors found no studies that simultaneously measured the pollution caused by a specific cemetery and its positive impact on the urban ecosystem, e.g., the presence of endangered animal species or plants in a given area. Such research would make it possible to unequivocally state whether the liquidation of a specific cemetery and the creation of, for example, a park in its place, would be a better solution than the continued existence

of a necropolis. Fears related to water or soil pollution, which are usually the result of an incorrect location of a cemetery [37], are mainly related to the concern for the health of people living in the area. However, the broader importance of cemeteries should be taken into account, not only as areas that might be the source of soil and water contamination, but also as areas of non-human species, and places which connect society with history [5].

Additionally, it has been proven that high numbers of bacteria can be found near those graves in which the deceased were buried less than a year earlier [37]. The chemical changes of soil in burial sites persist for many years, but are not necessarily dangerous to the environment [41]. With this in mind, one might argue that the negative impact of a cemetery should be stopped or significantly limited once it is closed, not necessarily decommissioned.

The majority of the cemeteries in the researched cities were located with possible groundwater contamination in mind [26]. This, combined with the fact that the supply of water to 96% of households in Polish cities is from the municipal water supply [42], reduces the potential risks of drinking water pollution by city cemeteries.

4.2. Green Areas That Used to Be Cemeteries

When decommissioned cemeteries are transformed into other forms of green areas, in some respects, areas with a new function may be of greater ecological value to the city than before.

First of all, although they are treated as green areas [5], cemeteries in Poland have a lot of hardened areas. After transforming a graveyard into a park, the tombstones are removed, and the biologically active area of the site increases. The same applies to cemetery paths, where access to each grave must be ensured, so there is a need for more passages in the cemetery than in a park (Figure 2).

Second, pollution is associated with a considerable accumulation of decaying corpses, which is unusual for the natural environment [43]. Therefore, it can be concluded that transforming cemeteries into a different form of urban greenery may provide a chance for a gradual regress of the pollution caused by decaying bodies.

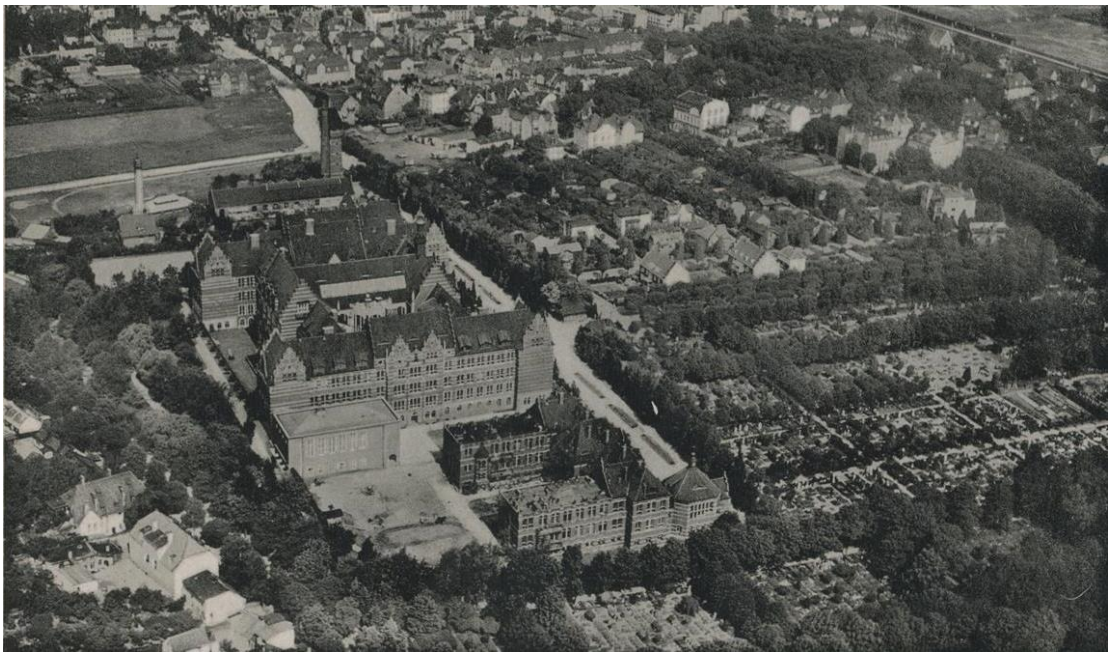
Converting a cemetery to a different type of green space has its advantages and disadvantages. Given how much the close environment influences the way the human body decomposes, such considerations would have to be addressed on a case-by-case basis. However, when the decommissioning of a cemetery becomes a fact, it may still benefit the urban ecosystem after transformation into urban greenery.

4.3. Former Cemetery Sites with a Different Function than Urban Greenery

In total, in both Gdansk and Wroclaw, approximately 210 ha of the urban area constitutes former cemetery sites. Only 37.1 ha of the area was developed for buildings or various forms of transport facilities. It should also be stated that this does not mean that the entire area has been transformed into impermeable surfaces, as permeable surfaces are often planned near transport routes and buildings. Research indicates that larger urban green spaces are of greater value for the ecology [44], being beneficial for both fauna [45] and flora [46]. Therefore, small green areas, such as those mentioned above, cannot fulfil the same function as larger parks or forests. Consequently, the introduction of a new type of development, where greenery and impermeable surfaces are in the minority, may negatively impact the urban ecosystem. Although this negative impact is not very significant, as the data presented in Section 3.2 prove, the converted areas of this sort are small, and there are not that many of them.

Additionally, as argued in Section 4.1, some cemeteries may harm the environment more than others. The percentage of former cemetery sites assigned functions other than greenery is much smaller in the researched cities. The method of burying the dead in urban areas until the end of the 18th century was not conducive to the health of the urban population, and certainly did not have a positive impact on the environment. Therefore,

the decommissioning of churchyards in historic city centers and their replacement with buildings or various transport facilities should be treated as a positive development.



(**a**)

(**b**)

Figure 2. Parks in place of the former cemetery site near the Gdańsk University of Technology: (**a**) a photo from around 1910 from the archives of the Faculty of Architecture of the Gdańsk University of Technology; (**b**) the same site photographed in 2021 by Łukasz Łowiec-Wygoński.

5. Conclusions

The decommissioning of cemeteries is not unusual and has occurred in each of the researched cities. There are circumstances that favor the decommissioning of a large number of cemeteries. In the case of the examined cities, such circumstances included the displacement and resettlement of those people who buried the deceased in a given area. The number of decommissioned cemeteries is greater in those cities that were incorporated into Poland after World War II. The liquidation of cemeteries was more frequent in places where historical continuity was broken.

There are arguments in favor of decommissioning cemeteries that mainly focus on groundwater pollution, which endangers people living near cemeteries. At the same time, there are ecological values, focused on the benefits of the fauna and flora provided by the existence of necropolises. The answer to the question of which of the elements is of greater value may differ from case to case. In order to assess whether a given cemetery should be decommissioned, further research is needed, taking into account at least three research areas: (1) the historical context, artistic values, and importance of the area for the population; (2) the threat posed by the existence of a given cemetery in terms of the pollution caused by the decomposition of buried bodies; and (3) the ecological values of the fauna and flora that will be lost after the cemetery is transformed into an area with a different function.

This article tried to answer whether the cemetery decommissions that have already taken place on a large scale in the investigated Polish cities have harmed the urban ecosystem, depriving them of green spaces. The majority of the former cemetery sites in the analyzed cities were transformed into various types of urban greenery, mainly parks. This is the best solution for urban ecosystems, given the alternatives, i.e., buildings or various transport facilities.

Cases of decommissioned cemeteries that were not changed into urban green areas and, consequently, that reduced urban green areas, can be treated as adverse circumstances for the ecology of urban areas. However, the percentage of such cases is small, and such cemeteries were not large, which reduces their ecological value. Given the above analysis, it can be concluded that the decommissioning of urban cemeteries in the analyzed cities in Poland has not had a significant impact on their ecosystems, because the major function that replaces them is of similar ecological value.

Author Contributions: Conceptualization, and methodology, A.M.; formal analysis, A.M. and W.D.; investigation, A.M.; data curation, A.M. and W.D.; writing—original draft preparation, A.M.; writing—review and editing, J.S. and W.D.; visualization, A.M.; supervision, J.S.; project administration, A.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The maps of existing and decommissioned cemeteries are available online at: Gdansk—https://www.google.com/maps/d/u/0/edit?mid=14I3cT4Cx-Yjlwda9_orgYJ1LC67RFCpN&usp=sharing; Warsaw—https://www.google.com/maps/d/u/0/edit?mid=1fo-XbiO-Q7dMaAlQgyUUQIX5Of-I0sfx&usp=sharing; Lublin—https://www.google.com/maps/d/u/0/edit?mid=17FGw2wjzorN21kG4AEJIUUjCkL35bCTB&usp=sharing; Krakow—https://www.google.com/maps/d/u/0/edit?mid=1I3d3n4WE_ejGXrGpUp9XImySMjygq0X0&usp=sharing; Wroclaw—https://www.google.com/maps/d/u/0/edit?mid=1VcMX1MQ5jMnMNt_i63PREHFu-a2lAoMz&usp=sharing. Data with information about the examined cemeteries are available in the following database: "Cemeteries in Gdansk, Krakow, Lublin, Warsaw and Wroclaw", doi:10.17632/7dyr836jsz.1 [47].

Acknowledgments: Many thanks to Łukasz Łowiec-Wygoński for his help in recreating archival aerial shots of cemeteries.

Conflicts of Interest: The authors declare no conflict of interest.

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