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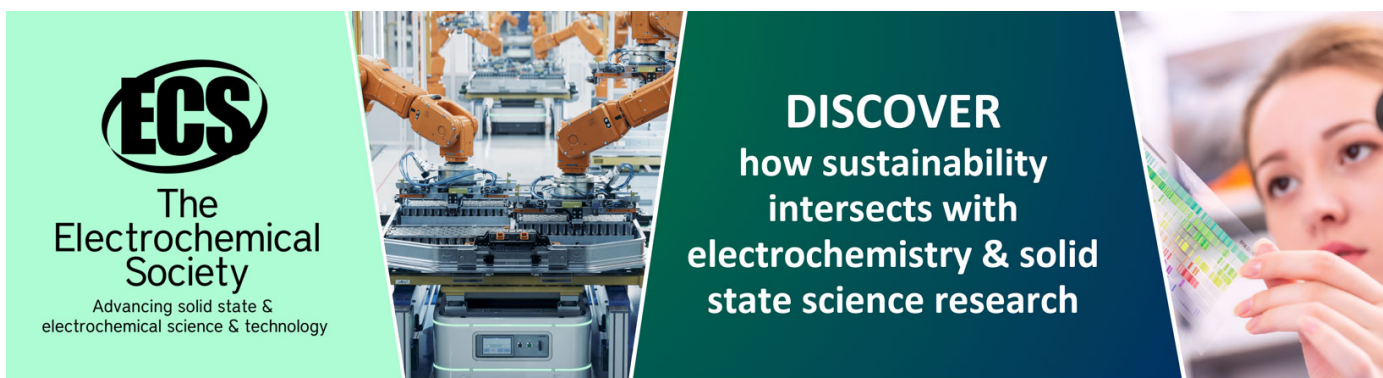
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Places for Green Areas in the Spaces of the Modern City

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Abstract. The aim of the work is to answer the question about the place for green areas in the spaces of the modern city. Presented considerations are based on field studies carried out by the author, supplemented by photographic documentation, and the analysis of available iconographic materials and literature. The research covered areas "reclaimed by nature" and included in the structure of selected European cities. Discovering (by planners) the potential inherent in these areas, both natural and cultural, brought a number of excellent spatial and functional solutions. We find examples of such solutions in the spaces of many European cities. These are, for example, parks created in the former railway areas of Berlin; in Madrid, the reconstruction of the city ring road, which allowed for the reclaiming of the areas on the Manzanares River and the creation of a several-kilometre long park on the waterfront. It became commonplace (especially in large cities) that space for green areas is created on roofs and walls of buildings, and more and more often, in small undeveloped areas where Pocket Parks are created. At the end of the 20th century, a phenomenon known as "urban gardening" emerged very clearly in the spaces of cities. As a result of socio-ecological initiatives in various parts of the urban structures, also social gardens are created. These vary in terms of size and are diversified in terms of the spatial and functional solutions applied. The analysed natural spaces are places of rest, relaxation, but also educational and cultural events; they are included in the green structure of cities and they become their integral part. Clearly visible is also significant participation of local communities in creating these spaces and taking responsibility for their use. Presented examples indicate a clear change in thinking about the role of green areas in urban space and the benefits it can give to city dwellers. The positive social, ecological, spatial, functional and compositional effects obtained in these projects may be an inspiration to create non-standard solutions for transformations of other urban structures.

1. Introduction

The need to maintain, utilize and strengthen the natural potential of cities is being strongly emphasized these days [1,2] The actions undertaken in this respect involve the preservation of the existing natural resources, but also the transformation of various types of land that has lost its current function or has been neglected, into green spaces with a very diverse functional program, size and relationships with the urban tissue [3]. These natural spaces are intended for rest, relaxation, but also educational meetings and cultural events. The "reclaimed by nature" areas are included in the green structure of cities and become their integral part.

In accordance with the idea of sustainable development and the latest design trends, interesting examples of transformations of the urban tissue using the potential of "abandoned areas" can be found in many European cities. Such reclaimed areas, e.g. in the spatial structure of Paris, where green spaces were created, include: areas of the former slaughterhouse and meat markets (the Parc de la La Villette),



bottling plant and wine warehouses (Parc de Bercy), or the closed car factory (Parc André Citroën with captivating solutions of theme gardens). Also, the Jardin Atlantique located above the platforms of the Montparnasse station, or the Parc de Belleville created on the site of a closed gypsum mine, are definitely worth mentioning [4].

A different manner of using the elements of the natural and cultural environments in shaping a new image of “abandoned” sites is presented e.g. by the parks built on the disused railway line in Berlin: Park am Gleisdreieck, Park am Nordbahnhof, Natur-Park Schöneberger Südgelände. Green spaces created as a result of revitalization activities carried out on the former rail line near the King's Cross station in London as part of the King's Cross Central project, are an interesting example as well.

In London, the coal storage yard in Camden was also reclaimed resulting in Camley Street Natural Park being established there, and the theme park of wetlands London Wetland Centre was created in place of the 19th century drinking water reservoirs. A group of small areas which have not been developed for various reasons, adapted to become social gardens or pocket parks, has been continuously increasing for several years. This phenomenon is particularly visible in the downtown areas which lack space for green spaces.

The article analyses examples of the areas functionally “abandoned” as far as communication routes are concerned, which were then “reclaimed” by nature. Such areas “reclaimed” for green spaces include: disused railway lines, urban road communication routes. This research paper draws attention to various possibilities of using the existing natural and cultural values in shaping new green spaces. The selection of examples for the research studies resulted from the belief that they could be used to illustrate the direction of contemporary transformations of degraded linear urban structures. The analyses were carried out based on the field research performed by the Author, supplemented with the analysis of available iconographic materials and literature, as well as photographic documentation.

2. Green urban spaces on disused railway lines

One of the oldest green projects implemented on disused rail lines is “Promenade-Plantée” commissioned for public use in 1993 [5]. It is one of the longest walking paths in Paris, connecting the Bois de Vincennes with the Opéra Bastille area. The promenade was built atop the 100 years old city rail line closed down in 1969. The main assumption was to create three public gardens. The Jardin Hector-Malot, occupying an area of 2.4 ha, was created on the roof of a multi-storey car park for 450 cars. The 15-hectare Jardin de Reuilly was built on the site of the former marshalling yard of the Paris Métro. The third park, at the end of the green promenade, is the Jardin *Charles Péguy* with an area of 13.0 ha, built between 1988-1989, with characteristic reservoirs and fountains.

An interesting project for rehabilitation of a former rail line was proposed in one of the central districts of Stockholm - Södermalm. Completed in 2012 on the disused railway siding, this community project was implemented, sponsored by the organization Trädgård på Spåret (“Garden on the tracks”) [6]. This “temporary garden” was established on the abandoned railway site, which was earmarked for housing development in the future. Plants are grown in separate containers made of recycled and easy-to-transport materials. A special place has been designated for the “eco-market”, for the educational centre and for the catering point offering dishes made from vegetables and fruit cultivated in the garden. As a result, with relatively small financial outlays, it was possible to utilize this abandoned area to create a green space that fulfilled a number of important functions: educational, integrating the local society, providing access to cheap organic vegetables and fruit, offering contact with nature and proposing an alternative form of recreation.

Examples of a comprehensive approach to the issue involving the management of disused railway lines is found in Berlin. Three of such parks: Park am Gleisdreieck, Natur-Park Schöneberger Südgelände and Gleisdreieck-Flaschenhals. occupy a key position in the Berlin green infrastructure, being part of the nearly 40-kilometre long, north-south green belt. This green space is part of the concept of Berlin's Green Axis Cross and the Inner and Outer Park Rings [7]. Each of the parks preserved the elements related to their railway past in their space.

The oldest of the parks, Natur-Park Schöneberger Südgelände [8], was opened in 2000. Located in the Tempelhof district of Schöneberg, the park occupies an area of 18 ha. It was built on the site of the former Tempelhof station, operating in the years 1875-1952. This park is a special combination of nature, technique and art. The designers respected the fact that before the design work was commenced, the park had been “controlled by nature”. Therefore, while introducing new elements of the development, the presented concept attempts to interfere in the existing natural environment as little as possible. The project also protects forest and meadow habitats by creating a reserve covering an area of 3.9 hectares. Railway artefacts remaining in the park space bear witness to its past: at the entrance to the park, there is a 50-metre high water tower constructed in 1927, a building of an old steam locomotive shed, railway tracks and a steam locomotive standing on one of the tracks. The new elements with industrial character: seats, platforms, viewpoints, swings, or graffiti walls, are perfectly incorporated into the green space of the park (Figure 1).



Figure 1. Natur-Park Schöneberger Südgelände - railway artefacts and modern elements with industrial aesthetics located in the park space (photo by author, 2013)

The area of the old steam locomotive shed is a particularly interesting site. Various artistic events, which are extremely popular, are organised inside this building. In its vicinity, a “secret garden” (referred to “Giardino Segreto”), surrounded by a wall was created. The visitors enter into the garden through a three-meter high steel gate-shaped sculpture. The garden space is filled with colourful steel art installations and sculptures by the Odious group. The green present in the garden takes geometric forms or is part of the presented installations and sculptures (Figure 2).

The Park am Gleisdreieck [9] is certainly unique due to the space it occupies, the location and diversity of the spatial and functional solutions used. Located on the border between the two districts of Kreuzberg and Schöneberg, it was created as a result of the revitalization of the “Gleisdreieck” - disused U-Bahn station. The railway line and the related objects destroyed during World War II were never rebuilt and they slowly degraded. In the 1970’s, the concept of developing this degraded area was created, however, the proposed solution faced strong criticism of the residents of Berlin. Another development concept for this extremely attractive area (due to its location), emerged after over thirty years. Approved by the residents, it was selected as part of the contest of 2006. The design prepared by Atelier Loidl

Landschaftsarchitekten und Stadtplaner assumed the transformation of this area into a public park with an area of 26 ha. The park would consist of two parts: the eastern one (Ostpark) and the western one (Westpark), separated by a long-distance railway line Berlin-Leipzig. Despite this functional barrier, designers managed to maintain the cohesion between both parts of the park. This was made possible because the railway line was treated as an integral part of the park, and an interesting solution for an elevated passage was implemented.



Figure 2. Natur-Park Schöneberger Südgelände – space of the garden “Giardino Segreto” (photo by author 2013)

In September 2011, the eastern part of the park with an area of 17 ha was opened as the first one. It is this part that reminds of the railway past of the park and, at the same time, it is the space “controlled by nature” (Figure 3). The northern part houses the main square with stands and a stage, where concerts, theatre performances and various artistic activities are held. On the eastern side of the vast meadow (“Kreuzberger Wiese”), which is the central part of the park, there are sports grounds and an unusual playground: “Space for experiencing nature”. The playground was opened for public use in 2006. It preserves ruderal vegetation, which creates a special atmosphere for playing there, but also for observing and learning about the world of plants and animals. In the vicinity of the playground, there is another green space: intercultural social garden “Rose Fragrance”, which is a venue for meetings and integration of representatives of various nationalities living in Berlin.

The second part of the Park am Gleisdreieck (Westpark) was completed in May 2013. As in the Ostpark, the central part is occupied by a vast green space of the meadow - “Schöneberger Wiese” (Figure 4). The adjacent areas have very different functional programs: these are sports and recreation areas, playgrounds and even a sandy beach. “Garden in the garden” is a special place in the park, consisting of allotment gardens located in its vicinity and included in the park space. The garden is where organic vegetables and fruit are grown, it is a place where visitors can exchange experiences, it is open to all park users, not only allotment garden owners. The space which has been created, like the intercultural garden in the eastern part of the park, is an example of the so-called urban gardening.



Figure 3. Park am Gleisdreieck (Ostpark) – area of former railway line “reclaimed” by nature (photo by author 2013)



Figure 4. Park am Gleisdreieck (Westpark) - “Schöneberger Wiese”, main green space of the park (photo by author 2013)

In April 2013, on the south side of the eastern part of the Gleisdreieck Park, the implementation works of its next fragment were commenced. Due to the shape of the occupied area, this part of the park was called “Park am Gleisdreieck-Flaschenhals”. The park opened for use in 2014. It was built on the disused railway line between Yorckstraße and Monumentenstraße with a total area of 5.5 ha. The

completion of this investment, and the implementation of the green belt Nord-Süd-Grünzug in its vicinity, led to the creation of a continuous, green corridor connecting public spaces in the Potsdamer Platz complex with the Natur-Park-Schöneberg Südgelände area. On the scale of the urban greenery system, the completion of these investments ultimately sealed the above-mentioned green north-south axis, extremely important due to its central location in the urban structure of Berlin. Both the eastern and western parts of the park are easily accessible from the S-Bahn and U-Bahn public transport. The network of pedestrian and bicycle connections with other public spaces of the city is also legible and attractive. The financial support, within the so-called environmental compensation policy, provided by the investors carrying out investments in the vicinity of the Potsdamer Platz, was of great significance [10].

The Park auf dem Nordbahnhof in Berlin [11] and the Lohsepark [12] in the HafenCity district in Hamburg are undoubtedly interesting due to the spatial and functional solutions applied. They are places of recreation and memorial sites at the same time.

The Lohsepark is the largest green space of HafenCity, although covering only 4 ha, partly commissioned in 2016. The park created on the medieval fortifications of Hamburg, is the closure of the first “green ring”. In the space of the park, there is a place for sports, for various forms of recreation, but there is also a memorial to the victims of Nazism. A 300-metre long and 2-metre wide line obliquely crossing the park reminds about the history of this place, symbolizing the tracks of the Hanover station from which deportations took place during World War II. Similarly, both its railway past and the past associated with the division of Berlin after the Second World War were etched in the green space of the Park auf dem Nordbahnhof. The park is part of the Berliner Wall Memorial concept.

3. Communication routes reclaimed for greenery

Reconstruction of communication routes is a phenomenon that is clearly visible in the space of modern cities. It is determined by functional and ecological reasons. The scope and scale of these transformations is very diverse, ranging from a slight adjustment of the communication system to its complete elimination. In the first case, small green projects often appear in the vicinity of the communication route. In the second case, the area occupied by road transport is transformed into a multi-functional public space, often with a large contribution of water and greenery in the shaping of its natural elements.

A special example, both in terms of its size and applied functional, spatial and engineering solutions, is the Madrid Rio Project developed by the designers from West 8 urban design & landscape architecture and MRIO Arquitectos Asociados [13]. The investment was carried out in years 2007-2011, on the area occupying 80 ha, on the Manzanares River in Madrid. The main assumption of the project was the recovery of the spatial and functional relations between the city and the river. It was associated with necessary transformations of the communication system in the area of the river. The biggest problem was posed by a 6-kilometre section of the M-30 motorway running through the city, which ran along the river. The design proposed the reconstruction of the M-30 motorway by relocating it into underground tunnels of a total length of 43 km, and this plan was implemented. The designers proposed that the reclaimed area should be transformed into a green corridor with a very rich recreational and sports program.

Due to the size of the investment, the entire area covered by the project was divided into three parts. Strategic designs, which included also smaller investments, were developed for each part. In total, 47 individuals, but coherent projects were implemented in the area covered by the plan. Thanks to the materials used and the plant species, green public spaces with different names, a different functional program and a different spatial expression were created. The reference to the cultural identity of the neighbouring areas was also important in the shaping of these spaces. One of the examples of such a green space is the Salon de Pinos, opened for public use in 2010, whose name was derived from the 8,000 *Pinus Pinea* (stone pines) planted here. The park with its playgrounds, places to rest, pedestrian and bicycle paths running at various levels, is entirely located above the tunnel with a 6-kilometre section of the motorway (Figure 5).



Figure 5. Salon de Pinos - pedestrian and bicycle paths running at various levels (photo by author 2013)

The largest park located on the Manzanares river is the Parque de la Arganzuela, completed in 2011 (Figure 6). On 23 hectares of the riverside, extensive recreation areas with fountains, beaches, vast lawns, and flower beds have been designed. There is also a place for a skate park, and a large playground with artificially created differences in elevations to locate numerous water slides. The main theme of the park is water. Soft lines of walking and cycling paths, flowerbeds and yards shaped in the same way, as well as meandering beds of designed dry rivers characteristic of this part of the park – they all remind of water.

The other large green designs included in the Madrid Rio project include: the Huerta de la Partida, a greenery complex implemented in years 2007-2010 on the former royal orchards and gardens, the Jardines del Puente de Segovia with the characteristic water pools located in the vicinity of the oldest bridge in Madrid; two of these pools are filled with aquatic vegetation, and in the remaining ones, the fountains jet water above the surface. The stone seats, which are amphitheatrically descending towards the river, are characteristic for the Jardines del Puente de Toledo, while for the Jardines de la Virgen del Puerto it is the building La Ermita de la Virgen del Puerto.

The elements integrating individual green public spaces include: boulevards, pedestrian and cycling paths running at various levels. An important role in this solution is also played by bridges and footbridges for bikes and pedestrians, which are not only elements of the communication system, but also viewpoints or places offering rest in the shade of trees, just like the Puente Oblicuo pedestrian-bicycle bridge, obliquely crossing the Manzanares river. The Arganzuela Bridge, connecting the southern and northern parts of the city, makes an unusual spatial impression. The bridge consists of two steel cones meeting at the top of the park hill, shifted relative to each other and separated by a pedestrian path. The southern section is 120 m long and the northern section is 128 m long. The diameter of both is 5 m at one end and 12 m at the other. The steel structure of the bridge is wrapped with a spirally twisted band made of a metal mesh.



Figure 6. Parque de la Arganzuela - in the background, the spiral pedestrian-and-bicycle Arganzuela Bridge designed by Dominique Perrault (photo by author 2013)

The harnessed potential of riverside areas, creating spaces which would be attractive in terms of space and functionality as well as their integration translated into the development of a coherent spatial structure. This structure penetrates the urban tissue in many places and merges with the riverside corridor of the adjacent areas. This is the role played by Avenida de Portugal, which was reclaimed for greenery. Freed from road traffic, the street turned into a cherry orchard reaching the riverside areas. The cherry blossoms motif also appears on the pavement of the designed walkways and on low walls pedestrian can sit on.

Madrid Rio is the next element in the Madrid green space system. The Madrid Rio Park is a fragment of the larger Parque lineal del Manzanares, currently under construction. The space of greenery and water in the park is to integrate the city space with the areas located in its vicinity.

4. Summary and conclusions

Over the centuries, greenery has always been an important element shaping the spatial structure of European cities, as evidenced by numerous historical designs preserved in their spaces [14, 15]. It has been an element of composition, has played a functional role, has been used for climatic or healing purposes, etc. Recent years have brought new trends in the shaping of the natural space of European cities. The manifestation of these trends includes the use of the natural and cultural potential of “abandoned areas” and networks of their connections, active protection of habitats, reconstruction of aquatic and terrestrial ecosystems.

A considerable group of the “abandoned areas” which have been “reclaimed” for green spaces are communication routes. Due to their linear character, these areas can play the role of ecological connectors and create a frame of green infrastructure of the city, which is extremely important for the shaping of sustainable urban structures. Continuity, as a characteristic feature of these areas, also creates the possibility of using them for the integration of the urban space in the functional and compositional sense. Their convenient location in the urban tissue as well as the continuity being their characteristic feature, create the possibility to utilize these areas for the integration of urban space.

A distinctive phenomenon which has emerged in recent years is the significant participation of local communities in the process of creating green spaces, and taking responsibility for their shaping and use by those communities. The growing social awareness of the importance of contact with the natural environment, responsible use of its resources, own ecological crops, staying in public space together, is gaining more and more supporters. This phenomenon is manifested in the city space with diversified functional and spatial solutions, e.g. the green enclaves in the Park am Gleisdreieck: "Garden in the garden" or "Rose Fragrance".

The examples presented in this research paper point to various possibilities of harmonious merging of the elements of the natural and urban environments. The analysed natural spaces are places intended for rest, relaxation, but also educational meetings and cultural events, they are included in the green structure of cities and become their integral part. These areas, spontaneously taken over by greenery, still perform a communication function with their pedestrian and bicycle paths. Included in the green structure of the city, they become ecological corridors. The newly created green spaces with preserved traces of the industrial past, also become an element of the city's promotion, shaping a new image of a given area or a district, often with a significant influence on the decision whether to reside or work in a given place.

What draws attention in the analysed examples, is the phenomenon of greenery coming back to the areas which it was previously eradicated from due to various investments being implemented. This is a kind of a claim for its rightful place in the spatial structure of the modern city.

The final effect of the applied solutions depends on numerous factors. The prerequisite for coming up with positive spatial and functional solutions is certainly the recognition of cultural and natural values of the "abandoned areas" and their creative use. To a large extent, this effect also depends on legal conditions and coordination of planning activities. This planning coordination and applicable legal regulations, especially during the implementation of large investments, is clearly visible in the case of Berlin at the urban and regional levels. It results in the creation and implementation of coherent green urban structures, being continued in the metropolitan space.

The presented examples emphasise a clear change in thinking about the role of greenery in urban space and the advantages it can bring to city dwellers. The positive social, ecological, spatial, functional and compositional effects of these projects may become an inspiration to create non-standard solutions for transformations of other urban structures.

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