open city-scape • artisanal microclimates • landscape continuity • weather types

Emptiness as a Project. Warsaw's Artisanal Microclimates as a Response to the City's Post-Catastrophic Past

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Abstract

This article aims to shed light on Warsaw's urban design traditions based on expertise in passive landscape solutions as tested in local conditions. It focuses on the work of designers originating from the Greenery Studio of the Warsaw Reconstruction Office (BOS) from the 1940s to the 1990s. The studio's designs relied on open space arrangements and the urban microclimate component was treated as equal in importance to buildings.

Planned in a modern way, drawing on the principles of the Athens Charter of 1933, Warsaw's reconstructed urban structure can be approached today not with a focus on hygiene, but in terms of thermal comfort. Post-war solutions demonstrate that empty urban spaces can be designed to prepare the city for the increasingly felt effects of climate warming and extreme meteorological phenomena.

Warsaw's public space and housing estate common spaces ought to serve as areas that readily accommodate microclimates and thus become of benefit to the society. Last but not least, this approach may reduce the number of AC units installed in the city.

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Warsaw's open cityscape, with an abundance of empty spaces in the urban tissue, is considered a burdensome legacy of the city's post-war reconstruction under the communist authorities. Such voids are widely viewed as something that needs filling. Since the 1990s and the return of private ownership, they have been seen as dormant land awaiting private investment. In some cases, economic pressure has even led to the construction of buildings on memorial sites, where the *meaningful emptiness* or *arrested decay* of war-time ruins had been envisaged as a form of commemoration in a city that narrowly survived annihilation.

In their current form empty areas represent a valuable resource for the whole urban community. Such open spaces had been deliberately arranged in the city in order to regulate the local climate. It is vital to protect them from being devoured by construction and development. Moreover, they set exemplary models of an adaptive transformation of urban spaces that reduces their reliance on energy-dependent technologies.

Warsaw is well-suited for colder weather.

Owing to its geographical location, Warsaw is well-suited for colder weather. The city has retained its coal-fired central heating system and architecture with thick, frost-resistant walls, while its people lead a largely indoor lifestyle. Heatwaves are a relatively new phenomenon. And yet, extreme temperatures are expected to represent a major challenge for the city in the future, exposing its residents to the risk of overheating. Warsaw already uses more energy for mechanical cooling in the summer months than for heating in winter.

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According to the findings of the research project "Embodying Climate Change", led by Zofia Boni:

During group interviews in Warsaw, older adults talked a lot about how excessive heat increased their isolation. Some of them followed the policy advice and stayed at home, going out only in the early morning for groceries, or in the late evening to "catch a breath of fresh air." The participants rarely used the term "loneliness," but our results are similar to Klinenberg's findings about how the 1995 Chicago heatwave affected both people's health problems and increased their isolation. Our research participants often cancelled doctors' appointments and meetings with family and friends

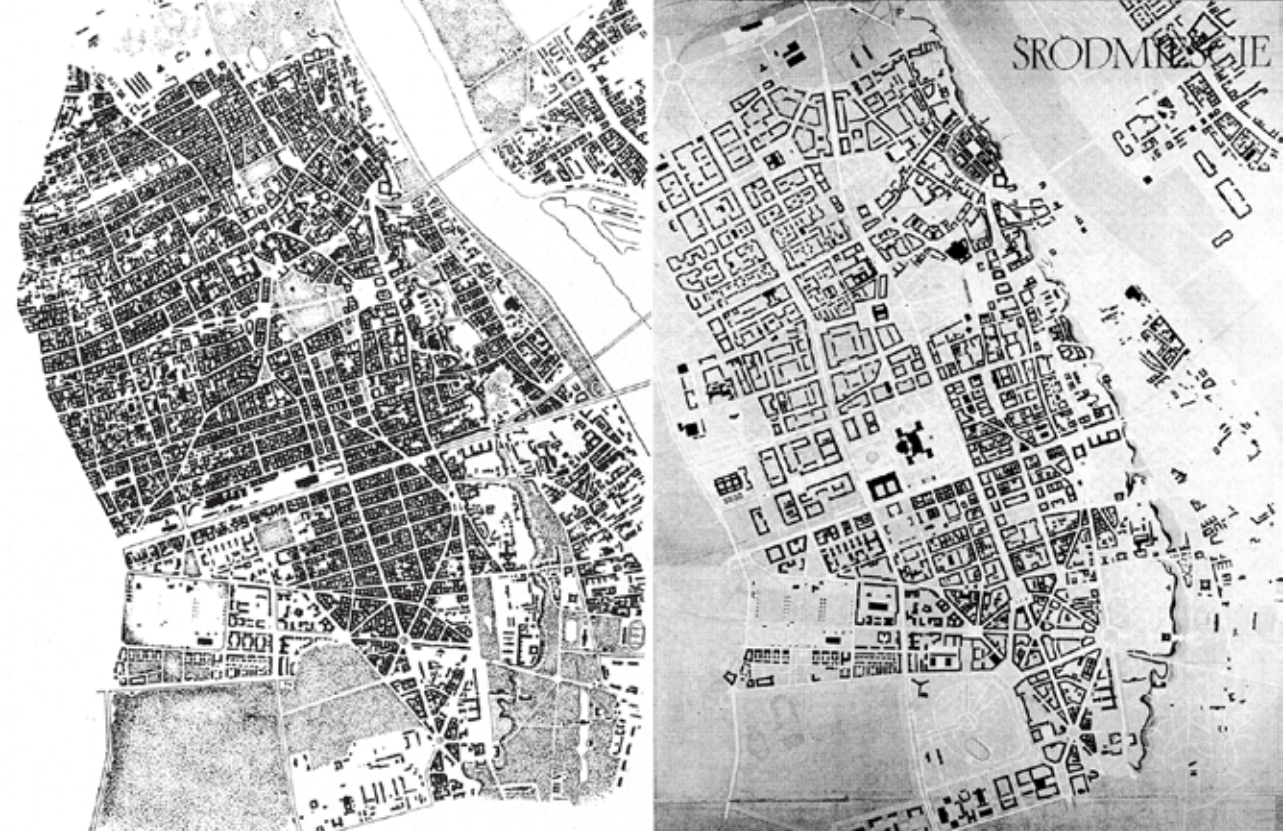

Fig. 1 - Comparison of housing density, 1938 vs. 1956 (projected), drawing by Kazimierz Marczewski, repr. from: "Architektura", 1956, no. 11–12, p. 430, Association of Polish Architects (SARP) Library.

and stayed at home alone waiting for the heat (wave) to pass. (Boni et al., 2023)

Some old homes are difficult to ventilate because they were designed to keep the heat in. Such buildings effectively retain heat within their thick walls, and thus become heat traps in prolonged periods of hot weather. As a result, the air inside may actually be hotter than outside. Meanwhile, urban spaces prepared to face the challenge of extreme weather conditions can offer an attractive outdoor experience.
After the Second World War, Warsaw's urban fabric saw its morphology almost literally reversed:

The traditional closed cityscape was largely exchanged for an open cityscape where, rather than the streets and squares being carved out of the solid mass of buildings, the buildings are autonomous objects surrounded by space. (Ibelings, 2011: 28-29)

This was due to the scale of the city's war-time destruction, but also Warsaw's planning traditions developed since the 1930s. Importantly, the reconstruction plans should be seen in the context of the urban planning concept known as "Functional Warsaw" ("Warszawa funkcjonalna"), formulated in 1934 (Chmielewski, Syrkus, 2013). This manifesto proposed a hub-and-spoke model of the city's development in which urban fabric would be secondary to natural one. It drew on research into the spatial relationships between the city and its surroundings. A pioneering study of the city as a functional region, the proposal introduced the term "urbanized region," with reference to the distribution of urban functions across a given territory. An analysis of fixed factors (geographic location, climate, geomorphology, and major transport links) provided the basis for a functional scheme of the city's development in time and space.
The planners continued their work in secrecy throughout the German occupation in the first half of the 1940s. They carried out a number of diagnostic studies devoted to the city's destruction and created sketches for the "Warsaw Urban Complex – the Discontinuous City" project, a layout based on topography and hydrography, thus embracing landscape design. During the war, natural elements took on a new significance since they were seen as something that does not fall prey to destruction. The sketches in question featured buildings grouped in rows and separated by vast green areas that demarcated different districts. These principles informed the start of Warsaw's reconstruction.

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Alina Scholtz
The Greenery Studio of the Warsaw Reconstruction Office (1945-1949), headed by landscape architect Alina Scholtz (1908-1996), was responsible for designing the arrangement of spaces between buildings in pursuit of developing an open cityscape. Scholtz was among the founding figures of Polish landscape architecture. One of the first and most talented graduates of the Department of Landscape Architecture and Park Studies at the Warsaw University of Life Sciences (SGGW), she designed modernist gardens, parks and monuments that have been preserved until today. (Czerniewska-Andryszczyk et al., 2021) Moreover, she

Fig. 2 - Warsaw Urban Complex, an organic development model with a cellular structure, sketch 1:100 000 by Jan Chmielewski, December 1941, repr. from: *Historical Atlas of Warsaw Volume II* (2004), Warsaw, Association of Friends of the State Archive of the City of Warsaw, p. 69.

established and looked after the Park-Monument in Żelazowa Wola, headed the Greenery Studio at the Warsaw Reconstruction Office, and at the Warsaw Urban Planning Office (1949-1958). Scholtz was a creative force behind Warsaw's modern-day landscape, and a co-founder of the International Federation of Landscape Architects (IFLA). She stated:

> In the field of design, the Greenery Studio was primarily involved in and enthusiastic about citywide concepts – large-scale spatial plans that we believed could be implemented. This was a common attitude: to rebuild Warsaw from the ground up, enriching it with new foundations based on historical tradition. This was accompanied by a fresh perspective, which – among other things – allowed us to appreciate the natural qualities of the place – the topography of Warsaw. (Scholtz, 1965: 5)

The studio developed a number of design strategies and initiated gradual processes, understanding that the intended results would take decades to achieve. It

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was necessary to consider how a project would evolve over time, which was something markedly different from reconstructing buildings and permanent structures. This included both short-term changes within daily and seasonal cycles and long-term linear development of the landscape architecture compositions, involving the growth, maturation, withering, and death of trees. Different types of trees grow at a different pace, while their lifespans also vary. Scholtz embraced these factors in her work by estimating the time needed for the designed planting to mature and predicting how much space it would eventually require.

She designed *transitional* forms with a variable, evolving composition, whose certain elements disappeared or died to yield place to others before the latter fully developed. In her designs, she drew trees in spiral forms to indicate that they grew with time. The tree species planted on a mass scale in Warsaw by Scholtz's team was linden. This specific variety emerged spontaneously in the city's tree nurseries between 1898 and 1900. First described in 1926, it received its name "Tilia Varsaviensis" in 1951. The use of seedlings propagated in the 1930s can be seen as a symbolic gesture of restoring the capital's nature. Fortunately, this lime tree species is relatively best adapted to warming climate and drought.

Because of limited resources, the landscape architects often based their designs on natural thermodynamic processes, vegetation, water circulation and the thermal responses of materials. A vital concept was that of landscape continuity. A network of interconnected green spaces, encompassing clusters of greenery, street trees, and greenery between buildings, was established. These spaces were linked to larger concentrations of green areas and integrated with regional-scale natural environments, forming a comprehensive green infrastructure system. It was understood that an appropriate architectural composition would reduce the negative effects of weather conditions and enhance the positive ones.

Fig. 3 - Oskar Hansen, *The Mazovia Belt*, Ursynów district along the river and the Warsaw Escarpment. Diagram of air circulation at night during radiative weather, 1968. Hansen, 1970: 137.

Two Key Types of Weather

In their design of microclimates, Warsaw's architects and urban planners took into account two types of weather. Their names can be found, for example, in Oskar Hansen's designs from the 1960s, created in collaboration with climatologist Stanisław Zych (Gola, 2005: 46, 48, 108-109, 21).

The first is *insolative-radiative weather,* cloudless during the day and windless at night. The sun illuminates the city during the day – the mosaic of materials warms up in different ways. Architectural solids, terrain features and plants are responsible for the movement and reach of shadows. By ensuring appropriate thermal contrasts, they set air in motion. At night, the city cools down, materials radiate heat in different ways – air heats up from the ground depending on the radiation emitted. Knowledge of the thermal responses of materials allows for combining them in a way that refreshes air. Owing to its low surface roughness, water draws air that settles above the city. The thermal inertia of standing water heats up the cool-

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ness of the night, generating updrafts. Greenery does not absorb as much heat as buildings and impervious surfaces. Cooler air, which is heavier, flows to heated areas and can be felt as light wind.
The second type is *advective weather*, observed during the horizontal flow of air masses. A weather front is formed in the contact area of masses with different properties. Clouds and rain reduce thermal contrasts, and wind mixes and moves bubbles of variously heated air. Conditions are similar everywhere, regardless of whether it is night or day. Only wind can change. A composition may accelerate it, create places with strong winds, overcooled zones, which increase people's immunity and respond to the needs of other inhabitants. Windiness can also be mitigated by forming quiet enclaves in the terrain, planting greenery as windbreaks, shaping architecture so that it casts aerodynamic shadows.
Understanding these types of weather allows us to perceive air as a mass that can be intentionally shaped. Microclimates in the city can be constructed once we embrace meteorological phenomena as a component of urban design. Historical projects from the era of Warsaw's reconstruction demonstrate that arrangements of open spaces are absolutely not devoid of purpose (Kuciewicz, De Iacobis, 2022).

Post-War Reconstruction as Building New Landscapes
The significant amount of rubble resulting from the war-time destruction and subsequent demolitions was repurposed in Warsaw's reconstruction as a fundamental terraforming element. In some cases, topography was shaped to alter wind patterns, and so-called "dry ditches" were created to divert cold air, while mounds proved capable of preventing gusts of wind, and retention ponds – of collecting melting snow. The greatest amount of rubble was used to regulate the Vistula over a span of 361 kilometers, from Puławy to Toruń. This architectural configuration appears as a palimpsest of hybrid transformations performed by both humankind and nature. Scholtz's team at the BOS's Greenery Studio was often compelled to use rubble in shaping the terrain, for example in Central Park of Culture and Moczydło Park.

Fig. 4 - Moczydło Park, aerial view, Lech Zielaskowski's photo archives, 1975, NAC, file no. 3/53/0/8/564.

Moczydło Park was built between 1957 and 1970 on the site of former clay excavation pits, adjacent to the Koło II housing estate, designed by Helena and Szymon Syrkus. The park comprises two distinct and yet symbiotic sections: a tall mound composed of rubble on the eastern side, which serves as a ski slope during winter, and a sunken area with interconnected pools of water towards the west. The topographic fold beneath the ski slope serves not only as an elevated barrier protecting skiers from sliding into the nearby ponds. Situated on the south-facing slope – where snow is the fastest to melt – it also directs meltwater and rainwater into a paved gutter that feeds the nearest pond. Retention basins have enhanced the functionality of the slope for years. The evaporation of water from the ponds and layers of trees planted around the water have created a favourable microclimate for the local area.

The composition of Moczydło Park needs to be adapted to changing climatic conditions. With the absence of high snow caps to feed the ponds as they melt, the movement of water and air requires to be managed differently, for example through horticultural interventions. In some cases, this means cutting openings in dense shrubbery to allow cool air to pass above

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The principle of landscape continuity, is represented by the Sadyba housing estate, created by Scholtz and Skibniewska between 1965 and 1978.

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the water; in others, it means allowing free-growing thickets to form windbreaks.

In the decades following the reconstruction period, socialist city planning often resulted in projects founded purely on centrally determined economic decisions. Warsaw began to sprawl, adopting an amorphous layout of prefabricated housing estates. It was in this context that Alina Scholtz began collaborating in 1958 with Halina Skibniewska at the Warsaw Housing Cooperative (WSM), a studio that was exceptional in cultivating the tradition of open space layouts. The estates built according to its designs garnered outstanding acclaim. The principle of landscape continuity, which aims to ensure the continued presence of ecological systems across time and space, is effectively represented by the Sadyba housing estate, created by Scholtz and Skibniewska between 1965 and 1978. Like most of Warsaw's post-war housing estates, Sadyba was designed primarily on the basis of CIAM's *existenzminimum* principles. The architects compensated for the minimisation of flat surfaces by offering a considerable amount of social space. As a result, the area between buildings became an extension of the flat, a "domesticated exterior". The quality of such space depended on the landscape architect's talent. Skibniewska believed that in the housing estate co-created with Scholtz "natural values are a fundamental element of the quality of life and a valuable stimulus for the inhabitants to identify with their place of residence" (Skibniewska, 1990: 395-405). The estate's most notable feature is a 1.5 km pedestrian walkway that runs parallel to the north-south axis. This verdant "backbone" connects the area's two main green spaces: a waterway and the parks surrounding the old fort. Skibniewska proposed the "green backbone", where the majority of schools, kindergartens, sports facilities, and recreational areas are located. Something of an open-air community centre, it enables environmental education programmes and intergenerational exchanges with senior citizens. Scholtz deliberately planted common whitebeam in one section of this passageway, which produces colourful fruit in autumn for children to enjoy on their way to school. In the southern part of the housing estate, she designed a pathway lined with birch trees that offer intermittent shadow. Furthermore, she scattered

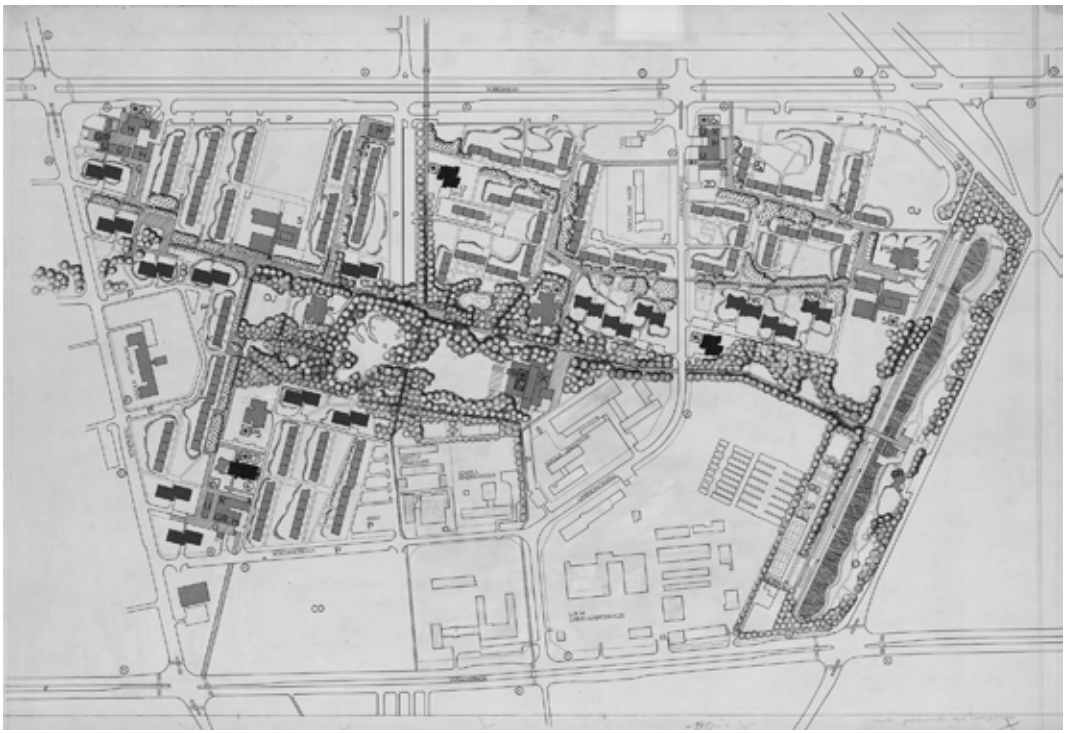

Fig. 5 - Sadyba housing estate, implementation stage, November 1977, implementation design, original scale 1 : 500 (unsigned), reproduction available at the Museum of Architecture in Wrocław.

mounds throughout the estate for winter activities, including sledging slopes, which additionally concealed water infrastructure.

A Tradition that Informs the Future

At the end of the socialist era, before the upheavals of 1989 and the advent of the neoliberal economic doctrine, Scholtz's last project was the Białołęka Dworska housing estate. Designed under the watchful eye of nearly thirty biologists, it was meant to become an environmentally friendly neighbourhood. Research was carried out into the area's "biotic and abiotic environment." Maps of natural conditions between 1976 and 1990 were drawn up, together with predictions of changes according to various housing development scenarios. It was assumed that the designed open space would be connected to the nearby forests, and the surrounding landmarks were also highlighted, following the principle of "fostering interest in local attractions." The design was never implemented, but it exists as a prominent example of an attempt to ensure the continuity of functioning ecological systems in time and space, a basic tenet of so-called *urbi-ecology*.

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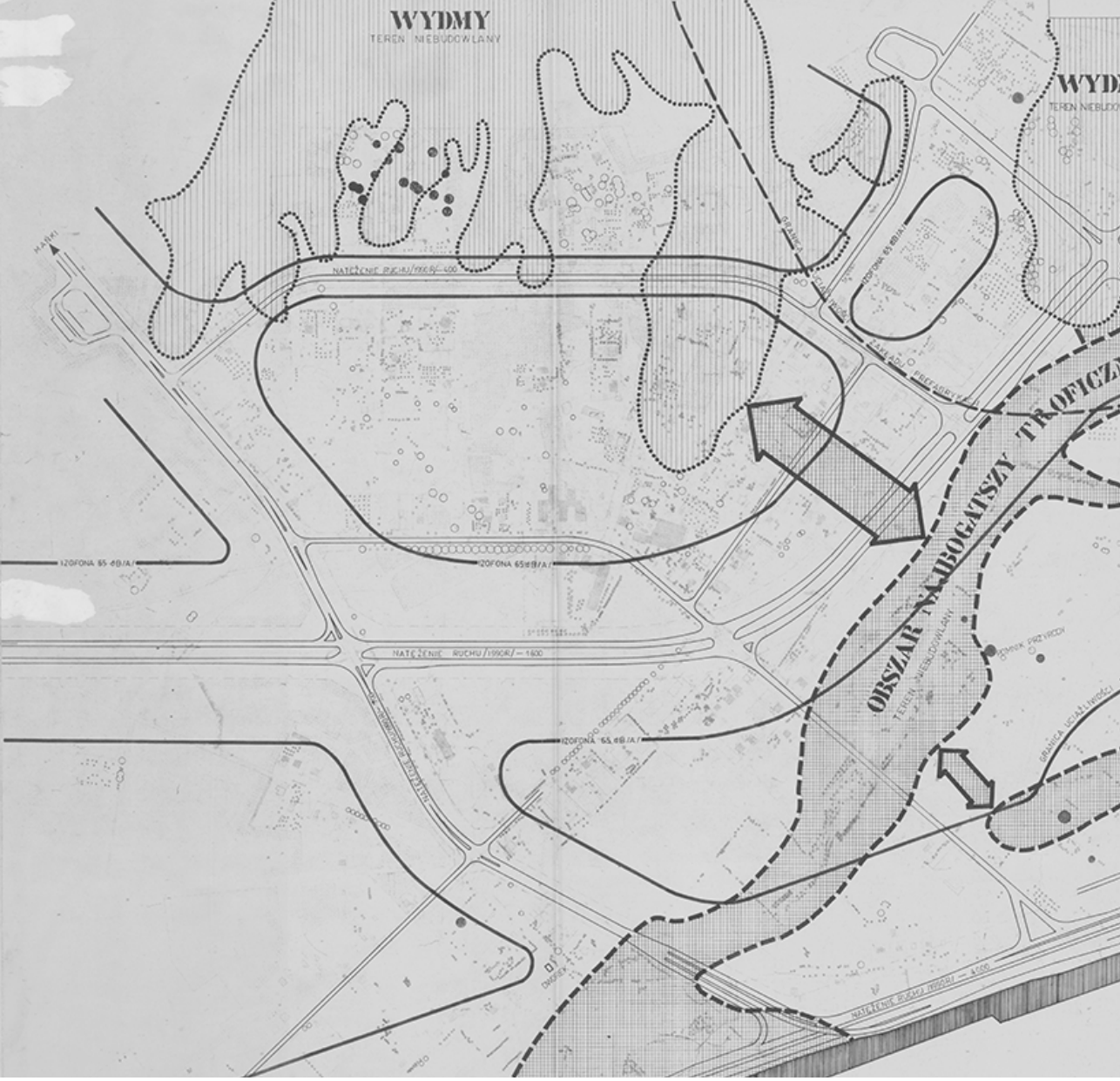

Fig. 6 - The Białołęka Dworska housing estate, programme and spatial concept, original scale 1 : 2000. Applications ed.: Alina Scholtz, Alicja Brejnak, Regina Ekielska; studio head: Krystyna Sokołowicz, undated reproduction, available at the Museum of Architecture in Wrocław.

Climate, biology and hydrography were interlinked in this project, and the natural functioning of the space was more important than the aesthetic criteria of development.

Przemysław Wolski, long-time lecturer at the Warsaw University of Life Sciences, who researches connections within climate-forming landscape structures, admits that the knowledge of passive landscape solutions developed by the interdisciplinary offices of the socialist era has almost been forgotten. No continuity has been preserved. This includes the disappearance of terminology. He considers it a mistake that in the

recent years the term “open space arrangement” has been replaced by “green and blue infrastructure.” The latter describes the system in terms of its visible components (greenery plus water), without considering air, which is shaped by the composition. It does not take into account the thermodynamic relationship, which is more difficult to perceive than the visible elements and yet exists as an equally important component of the urban structure:

The term *infrastructure* carries the connotation of subservience, but here we are not referring to human-made technical

elements that are meant to be subservient. We are talking about nature, which exists for itself. It is man, as an element of nature, who should serve it. (Wolski, 2023)

Warsaw can use the potential of “open space arrangements” to make the city’s organism and its metabolism limit negative weather effects and amplify positive ones.

Wolski is critical of recent housing developments, built following the closed cityscape formula, without conducting aerodynamic studies which he witnessed in the 1980s. He calls for Warsaw’s open cityscape to be appreciated and carefully shaped, at least in part, by a generation of landscape designers who embrace the thermodynamic interdependence of different forms of life in their architectural practices.
Warsaw, like many other European cities, is currently transitioning from a cold to a hot place and needs to proactively adapt to increasingly frequent extreme heatwaves. On an urban scale, the old rule can be applied: the river valley channels the air that settles over the city even when the weather is windless, with air movement caused by the river current. A fundamental aspect to take into account when it comes to the urban landscape are its cooling properties. Building on its design traditions, Warsaw can use the potential of “open space arrangements” to make the city’s organism and its metabolism limit negative weather effects and amplify positive ones. When the structure of a city is designed to harness natural phenomena to create optimal microclimates, as was done in some of Warsaw’s historical designs, there will be a reduced need for energy to mechanically cool or heat architectural spaces. Focussing on Warsaw as a case study, this article calls for a transformation of the disciplinary framework of current urban and landscape design practices in Europe and beyond. For a change that would put urban microclimates at the heart of the discipline’s endeavours.

References

Boni, Z. et al. (2023), *What is a heat(wave)? An interdisciplinary perspective*, "Climatic Change", 2023, vol. 176, 129 [Online]. Available at: https://doi.org/10.1007/s10584-023-03592-3 (Accessed 23 April 2024).

Chmielewski, J., Syrkus, S. (2013), *Warszawa funkcjonalna: Przyczynek do urbanizacji 8region warszawskiego*, Warsaw, Centrum Architektury.

Czerniewska-Andryszczyk, K. et al. (2021), *Alina Scholtz: Projektantka warszawskiej zieleni*, Warsaw, Muzeum Warszawy.

Gola, J. (2005), *Oskar Hansen, towards open form*, Warsaw, Fundacja Galerii Foksal.

Hansen, O. (1970), *Linearny system ciągły*, "Architektura", n. 4-5, pp. 125-137.

Ibelings, H. (2011), *European Architecture since 1890*, Amsterdam, SUN, pp. 28-29.

Kuciewicz, M., De Iacobis, S. (2022), *Antropocen*, Warsaw, Narodowy Instytut Architektury i Urbanistyki.

Scholtz, A. (1965), *Ruiny i wizja odbudowy – architekci o Warszawie sprzed lat 20*, "Kultura. Tygodnik Społeczno-Kulturalny", 1965, n. 3, p. 5.

Skibniewska, H. (1990), *Rola opracowań przyrodniczych w projektowaniu zespołów mieszkaniowych na przykładach Białołęki Dworskiej i Mokotowa*, in Biernacki, Z. et al. (eds.), *Środowisko przyrodnicze Warszawy*, Warszawa, Państwowe Wydawnictwo Naukowe, pp. 395-405.

Wolski, P. (2023), interviewed by the authors on 6 December 2023, recording in the authors' archive.