The Contemporary Sustainable Neighbourhood: Cracow's Wola Justowska district

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Abstract. The environment is the little "Homeland", which is defined by a neighborhood consisting of people and structures. The neighborhood is extended in time and space. The city of Cracow was chosen as a case study here. The contemporary environment in the Wola Justowska district is presented in the last examples of buildings designed by the author. Those contemporary structures are compared with historical houses in Cracow, which belong to the author’s family since the 19th century. The author analyses the influences of the period of the 19th century Austrian occupation, of a construction boom between the two World Wars, and of the Communist ban on design and construction in Cracow. In the paper's final remarks, the author notes that the design process and processes of shaping the environment look similar in the past century and today and that a contemporary neighborhood is shaped more by a cultural process than by design. Designing, building and endurance of a building form is a process that is shaped by culture and at the same time shapes the culture itself.

1. Introduction
Le Maison, Das Haus, Jesionowa 3, Talo, and Dos Casitas are projects designed by the authors in recent years in the Wola Justowska district. The authors of the article were born and lived in this district of Cracow. Buildings listed above have their typologies resulting from contemporary premises, but design and connected construction were prolonged multiyearly processes of designing itself and of obtaining building permits. First two houses were recognized by the representatives of the organization of architectural associations of the V4 Group as examples of the best one-family buildings and represented Poland during exhibitions in Budapest, Bratislava, Prague and Cracow¹. All these buildings can be reached within 10-minute cycling, which shows the scale of the place, quite like a medieval rule resulting in the city attainable within walking distance.

2. 19th century and earlier neighbourhoods
Within such a walking distance were my family’s properties in Cracow - in its historical borders, for example, a tenement house near Sławkowska Str. and Rogacka² Str. opposite St Mark’s Church (Figure 1), and now non-existent houses at number 10 and 11 Czarnowiejska³ str. The authors of their designs are not known today. However, the buildings’ 19th century locations are interesting, showing a

¹ Czech Republic, Poland, Slovakia, and Hungary constitute a political group V4 within the framework of the European Union, one that has common interests and promotes common values. The yearly competition for the best single-family houses which were designed and built in those countries is one of such activities of V4 group. Exhibitions presenting the chosen works are shown also beyond the countries, for instance in Lebanon.
² Today’s St. Mark Street - the name hails from the Klemens Bąkowski plan of the 18th century and archival drawings from the City of Cracow Archives
³ The building was realised after the year 1862 when large barracks were built at Rajska St. and before the year 1883 when it appears on maps for the first time – e.g., at M. Dąbrowski’s Tourists’ Plan of Cracow.
spatial image of the city. In the first case, behind the building at Sławkowska Str. there was an outbuilding, whereas the contemporarily known frontage of St. Marka Str. did not exist, because there were gardens there which were built over only in the second half of the 19th century. The relatively low intensity of buildings in the short distance from the Market Square is noteworthy – it helps to understand the dynamic spatial development of Cracow in the 20th century, also in its central part close to the Market Square itself. Building at Czarnowiejska Str., demolished and rebuilt at the beginning of the 1990s, was of exceptionally low technical quality and was limited in height to 1 story. It was the result of the vicinity of Francis Joseph’s barracks at Rajska Str.

Figure 1. Butelski Family tenement house near Sławkowska str. and Rogacka str. opposite St Mark’s Church

Regulations of the occupying Austrian authorities connected with the artillery fire in case of a siege forbade constructing larger buildings close to the barracks, and those which could be built were facing the possibility of being demolished. Hence, the buildings had specific typologies of two parallel parts in a gallery system with the access to many small rooms through a linear passage between the building and gallery. At the end of the complex there was a one-story outbuilding and further in the direction of Karmelicka Str. there was a garden. Front buildings were constructed directly at the borders of the plots with blind walls. In such a state, the structure lasted till the 1990s when it was demolished and built over with a front building and a perpendicularly set outbuilding. The original building consisting of dozens of small premises had one common toilet and but one facility with running water. That was a kind of a paradox as the building’s owner was the author of the patent of a WC water handle5. Since the end of World War II to the 1990s, in the Communist period, the property was brought to ruin, as it was managed

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4 1860-1862, designed by Feliks Księżański.
5 He has also patented a toilet water tank, as the Oesterreichisches Patentblatt, vol. 7 of the year 1995 duly informs; the patent had number 15013.
by the municipality and the proper owners had no influence on it whatsoever. During that time, no repairs of the building were carried out. The ordering of its legal status was also neglected, which, paradoxically enough, allowed for a relatively fast reclaiming. However, its deteriorated condition allowed only for demolition. Near the two buildings mentioned above, where Jan Butelski 6 lived and worked, there is the headquarter of the Chamber of Commerce and Industry at Długa Str., commonly known as the "House under the Globe" (Figure 2).

![Figure 2. Chamber of Commerce and Industry, Długa Str. Cracow, 1906, "House under the Globe". Architects Franciszek Maczyński and Tadeusz Stryjeński, Ship sculpture design by Jan Butelski.](image)

This brick building, erected in 1906, was designed by Franciszek Maczyński and Tadeusz Stryjeński and is marked not only by a characteristic tower topped with a globe, but also by a steel relief of a merchants’ ship adorning the elevation facing the Długa Str. This relief was realized by Jan Butelski [1] who was also the author of the column of the Polish Legions, now to be seen in the History Museum of Cracow [2]. In different historical sources, there are different names of his occupation, such as: tinsmith, ironworker, sculptor, and painter. In 1897, he even had an exhibition of his oeuvre mentioned in The Diary of Fine Arts Association 1854-1914. [3]. The building and sculpture of the ship characterize the arrival of the new era of Modernism and of a certain crisis in art and social relations at the eve of the First World War. Architecture of that period often included also other spheres of art such as sculpture and painting in its stylistic repertoire.

3. Neighbourhoods in the 20th century – between the Two World Wars

Constructed after the First World War in the 1930s in the district of Zwierzyniec, a 5-story tenement house was designed and built by the builder Wojciech Korzeniak7 (Figure 3). In structural terms, it was a tenement house with a band of windows referring to the Modern Movement manner, with a high-quality elevation finished with rare plaster with mica and a strictly utilitarian back elevation without such a finish.

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6 Author’s great-grandfather.
7 The other great-grandfather of the author.
Figure 3. Autor Family tenement house at 7 Ujejskiego Str., Cracow, 1930, designed by builder Wojciech Korzeniak.

Internal space of the staircases was finished very carefully and with high quality materials. Perfectly made terrazzo that was characteristic for many buildings of that period was particularly attractive. Moreover, many other details were of high quality and attracted attention for their precise finish, for example, railings and the door frame and crystal window panels of the entrance door. The aim of the project was to secure the livelihood of the family of 3 daughters and a son; the whole building had residential character and did not have other commercial premises. It is an interesting example of several essential social-cum-spatial conditions of the architecture of the time between the two World Wars in Cracow. Its realization was preceded by the construction of a building at 23 Kraszewskiego Str. with only 3 floors but with a similar articulation of elevation. In terms of urban planning, the construction of that tenement house fulfilled the idea contained in the plan of The Greater Cracow which was created before World War I [4]. That famed plan established the development of the city beyond the borders marked by the military conditions of Cracow being an Austrian fortress and gained new areas for the city, ones which were until then rural.

In the area of the old Półwieś Zwierzynieckie, it related to the creation of a new typology of buildings for rent, i.e., tenement-houses which filled an urban block system. Such buildings had a standard scale and they had as a rule 4 to 5 floors (about 15-18 m height). As it was stated above, the facades had quite luxurious finishing whereby the rear elevations were utilitarian. A typical street comprised of a transport route, pavement, and green belt. Garages and gates were rare. Services of these buildings were complex. Each dwelling had running water and sewage system, coal stove, heating, electricity, and telephone connection systems. With respect to the areas of Półwieś Zwierzynieckie, it is still necessary to remember about one essential premise: difficult geological conditions resulting from an elevated level of ground water and the existence of ponds. Until now, this geological fact is fixed in historical names, for example, Plac na Stawach [literally “Square with Ponds”] was founded in lieu of a reservoir indeed. The decisive role defining the architectural forms of those buildings was played by town planning decisions, regulation lines, and size of the nearby buildings.

Most often the authors of the designs were builders, owners of construction firms but not architects.
It resulted from the lack of an appropriate academic school in Cracow. If there appeared an architect as such in Cracow, he was most often a graduate of the Polytechnics in Lwów or Vienna or sometimes even of the Petersburg Polytechnic, like the famed architect Adolf Szyżko Bohusz, the founder of our faculty of Architecture. Famous was then the aversion of builders to architects. The latter were treated as strangers in the city. Significant were polemics led by professor Witold Minkiewicz who demanded the exclusive right to design - only for the graduates of architectural studies. That idea became partly realized in the period between the wars thanks to the resolution of the adequate Act, establishing such exclusiveness for the indicated cities.

4. Contemporary Neighborhood.
Buildings mentioned at the beginning, designed by the author, were in the Wola Justowska district and in Olszanica. Contemporarily, Olszanica is considered as a part of Wola Justowska, although from the formal legal point of view such a concept is incorrect. Wola Justowska became incorporated into Cracow during the German Nazi occupation in 1942 but Olszanica much later, after World War II, in 1975. The earlier consisted of residential districts, but the latter had a typically rural character. In the period between the World Wars, the first residential buildings with the character of a suburban residence were built. The prototype of such a building and the most valuable spatial layout in this area is the Decius Villa - a Renaissance palace with Gothic relicts set in a park. The essential spatial influence on the district in terms of its transportation system was the construction of a shooting range by the Austrian occupying powers at Królowej Jadwigi Str. and of the barracks at Modrzejów Avenue. Modernist villa, built for the daughter of the owner of a prewar popular journal, “Ilustrowany Kurier Codzienny”, one of the best known in the area, was nationalized after the war and functioned as an orphanage. After the war, until the year 1990, there existed limitations in the building at Wola Justowska resulting from political causes, because the construction of one-family houses was considered an ideological deviation. That directive was expressly written down in succeeding spatial plans and norms which hardly tolerated one-family buildings. Generally, the construction of one-family houses was developed in great measure as based on anonymous projects from catalogues, especially in the 1960s and 1970s. However, despite the intentions of the authorities, there originated several interesting buildings not constructed by the above limitations. One of them was the villa of the director of the Lenin Steel Mill, at the street leading to The Zoo and a twin villa at Cisowa Str. designed by architect Wojciech Pietrzyk with its beautiful band composition of elevations. Buildings were constructed in times of considerable limitations of access to structural and building materials, hence most often elevations were executed in smooth plaster; high-quality plasters were hardly there, only a so-called rinsed plaster. After the change of political system in the year 1989, there appeared a tendency towards multifamily buildings in the area. There are, for example, housing units at the crossing of the 28 July 1943 Str. and Królowej Jadwigi St., at the crossing of Królowej Jadwigi St. and Jesionowa St. and at Morelowa St.

These buildings offer dwellings in vertical division with common gardens and with parking spaces. These are closed and isolated residential complexes with limited and controlled access. Some of them were built based on the 1994 general plan permitting such development and the rest was based on individual urban planning decisions in the period when this plan lost its validity. Next observable tendency in urban planning was the decrease of the surface of a minimal plot for one-family buildings to 400 sqm. which was easy to observe since the year 1994. In the next local spatial development plan there occurred a reversal of that tendency, whereby the demand of a minimal plot for this type of construction as 600 sqm was expressed. However, there is an apparent lack of such plots, which indicates that the new plan had the aim of prohibiting development. Results from our research in this area [5], above all development of buildings along Królowej Jadwigi St., show that in 25 years the rate of development was increased by circa 50%. All undeveloped free plots were covered by buildings. Simultaneously, to prepare an area for investment, many divisions of larger plots, up to the size of 400

8 A research which was conducted by the author a few years ago, along with M. Zapala, i.e., a study of typology and function of development in Wola Justowska contradicts such a description in both historical and contemporary terms. Prevalent (in terms of functional type of development) is housing and service - office development, as well as large complexes with an industrial charter, such as vaccines producing plants. The characteristic trend of recent years is the development of multi-family housing. See (Butelski and Zapala, 2015)
9 What is Polish specificity
10 Housing development decision - WZIZT
sqm, were done in accordance with the recommendation of the local spatial development plan of the year 1994, but as it was stated, currently it is not possible to build on such a plot (following the new plan rules). The state of the extant fabric and the analysis of environmental conditions such as noise and air pollution as well as transportation, lead to the observation that the locating of service functions along Królowej Jadwigi Str is correct. This is carried out autonomously; buildings which formerly were constructed as single-purpose ones become multifunctional. In the area, there is a large concentration of registered firms and nominally one-family houses often fulfil office functions. Residential buildings are positioned mainly in the second line, and they are most often multifamily buildings or twinned houses.

Inevitably, the aforementioned spatial changes are a result of changes in social structure and there is an occurrence of lack of local identity. This resulted on the one hand in the influx of a large quantity of well-to-do inhabitants but on the other in the lack of knowledge, financial means, and education among the former owners of land in this (previously rural) area permitting them for the appropriate management of real estate. In effect, it is possible to observe a very well-known process of the so-called gentrification.

Any of the plans did not allow terrace housing, hence based on the typology of one-family twinned buildings, there are units limited to 4 elements. Detailed analysis of the problem is shown in our work in which we gave the formal and functional characteristics of the areas adjacent to Królowej Jadwigi Str. It is also necessary to emphasize that in Wola Justowska, in the broad picture, there does not exist a homogeneous typology of buildings. Buildings have their individualized, varying character depending on the investors. None of the recently prepared plans took essential decisions in planning new streets or in the rationalization of transport services and the range of infrastructure, nor proposed complex solutions or typology for the forming of new buildings. Proposed plans are unusually conservative force, for example, the construction of buildings with hipped roofs in places, where already before the war there were flat roofs. Consequently, the area is shaped mainly on the base of land servitude in terms of traffic and transportation. In this way, self-government authorities retreat from taking essential town planning decisions, and the responsibility must be taken by the citizens and by the inefficient judicial system. In the effect of the interactions, the spatial image of this region of Cracow sadly has an inharmonious character.

Two buildings, Das Haus and Talo, result from spatial conditions which are broadly discussed above. The German and Finnish names result in turn from the author’s own concept; such is the naming of buildings. It is necessary to remember that Talo, finished in the year 2016, was designed and prepared for construction in 2009. However, Das Haus, which was built earlier, was prepared in the years 2010 – 2013, which resulted principally from conditions caused by the neighbouring fabric.

4.1 Das Haus
Das Haus is a housing unit consisting of two one-family buildings in twinned layout (Figure 4), in Cracow at Powstania Styczniowego Str. This complex consists of 4 segments, two in each building with the perpendicular division of function, referring to row houses typology. Under each of the two buildings, there is a parking of 4 places, whereby together there are 8 places in the underground parking facility. In the area where the houses were built, there did not exist any plan. However, the city of Cracow prepared the division of the municipally owned farmland into plots and issued decisions on the conditions of development for each of them. This rather untypical activity of the city influenced positively the spatial order as well as the time of realization and the revenue of the city which profited from the sale of ready plots, earning considerably more than it would in the case of land without any town planning decision. Two appropriate plots for development were found on the northernmost part of the terrain, overlooking the railway leading to the airport and an open landscape of fields. Parallelly with the investment, the Malopolskie Voivodship realized the rebuilding of the railway line. As a result, there appeared an electrified railway line and its new stop - Olszanica. Thus, the location gained the accessibility of the city centre – but a 15-minute ride by train (a time that is impossible to

11 The definition of a single-family building as such, which has a maximum of two dwellings or a dwelling and a commercial unit, is defined in the Building Law. For a twin house consisting of two single-family houses, one can maximally obtain 4 dwellings - two in each building.
be reached when travelling by bus) and a 5-minute journey to the airport in Balice. Having such an ideal condition of transportation, the buildings are simultaneously in touch with the open landscape, which creates the chance of recreation for the inhabitants. At the moment of designing, the remaining plots were undeveloped and in the reign of city. After the beginning of construction, the neighbouring plots were sold at the succeeding public auctions and presently there are on buildings based on primitive decisions about the conditions of development. The neighborhood, in the form of plots belonging to the Treasury of State, in the reign of the city, contributed also to the fast issue of decision about the building permit – in the legally established time of 2 months that elapsed from submitting the complete documentation. This did not face any protests at the stage of the issuance of the permit and during its realization, a condition that is significantly different than the deplorable practice in other places of this district. The idea of housing units originated because of the studies on the structure and on the optimization of spatial parameters in the design of buildings. Trying to satisfy the demands, architects had to deal with the problem of the use of hipped roofs which were obligatory in accordance with the issued binding town planning decision. This problem was solved using the strategy of division of form in its part with steep roofs which were cut by flat roofs closing cubic forms. In the cubic form, there are all basic spaces such as bedrooms and living rooms with open kitchens, however closed forms with steep roofs provide extra space for bathrooms. The immediate light access to basic functions was ensured by closing the cubic elements by glass walls to their full height and width at the first and second story and to half the width of the ground floor. Consequently, the building became increasingly more transparent and given the right exposure but simultaneously, due to the transversal walls, separated from the neighbours. In the further phase of the design, one used the strategy of shifting the cubic elements in relation to each other that permitted to form terraces as private spaces belonging to each of the segments, which simultaneously offer insight into the landscape. Translocation and shifting of cuboids permitted also for the creation of natural roofing, resulting from the composition over entrance parts to the buildings and to the garden. The formation of drive into parking places and entrances which are placed under the plate of terraces of outer segments, enabling the roofing of the entrance and entering the parking from one side. Design strategy with respect to the town planning question relied on the use of decisions about the formation of the regulation line and the creation of a half-public space, open from the side of Powstania Styczniowego St., and of a private one, separated from the side of the garden which is accessible only after crossing through the flats. Underground parking places and terraces on them give physical accessibility to the garden, however not creating any visual barriers but only physical ones by means of different levels.

Figure 4. Das Haus- one-family houses in twin buildings, Powstania, Styczniowego, Krakow, designed by Kazimierz Butelski collaboration, Stanisław Butelski, Maria Mik Kraków 2012
Therefore, the structural and material solutions rely on a skeleton concrete structure filled with ceramic perforated blocks. The finishes of elevation in the parts with hipped roofs and at the layer of the ground floor are designed of stone which structure and colour are like earth. However, in the remaining part of the house they were finished in white plaster. Walls were designed with the internal layer of mineral wool insulation due to its acoustic properties in the airport zone. Moreover, for this reason, several specially consolidated window panels with spacers were applied. Rhythm dynamics of divisions and vertically shaped functions starting from the opened, accessible daily functions at the ground floor up till the intimately separated rooms at the first floor and in the attics - they all add up to the final, complex architectural solution of that residential unit.

4.2 Talo
Talo, completed in 2016, is yet another example of design experiments on the typology of one-family houses in twin buildings (Figure 5). This building is located on one of the axes closing the street at 28 lipca 1943 Str.in Cracow’s Wola Justowska. On its north-eastern side, there is the Decius Park to the south, the Sikornik Hill to the east and west there are single-family houses.

The issuance of the decision on the conditions of development for the two plots on which it is built lasted from 2009 to 2014. The building permit was obtained in 2015 and the building official submission occurred in the year 2016. Each of the buildings has two apartments and each of them also has two spaces in an open parking. The functional division is vertical and the division into individual units occurs on the internal stairs located in each building at the inner common wall. The project also provides for the future location of passenger lifts allowing for direct circulation to the apartments from the parking garages. The building is located on a slope towards the north. Such land morphology influenced the design concept based on three principal levels of terrain. The first, the lowest, is the level of an open garage with 4 parking spaces, another higher is the level of an open garage of the second building, and the highest level is the entrance to the upper building. Between the lowest level and indirect communication occurs on a ramp on the north side. On the other hand, to the highest level from the intermediate one we get through the external stairs which are also located at the north side. Such a solution and the release of the ground floor of both buildings on the one hand creates an open structure that gives insight to neighbouring plots of the expensive side, providing rain protection for residents and their cars. The space under the building is also semiprivate and is not permanently separated. Strictly private are the only gardens here.

At the eastern and southern side, green terraces were designed to correspond to the layout of stairs and ramps at the western side. At the lowest level, there is a parking place for guests and the entrance to the garden of one of the apartments is similarly solved in terms of functional disposition at the intermediate level. At the highest level, the entrance to the garden is led through a terrace directly from one of the apartments.

The lowest flats have green terraces on the terrain. The upper flats are two-storey and have outdoor lookout terraces facing the Decius Park and the Sikornik Hills, respectively, and the internal one facing opposite to the previously described views. From both buildings, the east-facing view, directed from the inside through the glazed walls of the rooms as well as from the balconies on the east side, has a longer perspective.

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12 The stone chosen by the author of the project was brought from Syria from the quarries near Aleppo.
13 In 2009, the investor, in the absence of the spatial development plan, requested several housing development decisions for these plots and for neighbouring ones in order to determine what buildings could be constructed in the area. Several of the decisions issued were abrogated for formal reasons as a result of the appeals of owners of the neighbouring plots. The planning decision on whose basis the building design was elaborated, and the building permit was issued was the only one that was not contested and thus it became final. During the construction itself, many times with the help of various state authorities, the neighbours have tried to obstruct the construction or to achieve the annulment of the building permit. Apart from the Polish law conducive to such anarchy one can see the reason for the state of affairs in the difference in property values in two different geodetic survey units in which the buildings were located, almost exactly 100% (PLN 45 000, in the unit no. 53 up to PLN 100 000 in the unit no. 10, both for 10 are).
Terraces of buildings were formed as indentations in sloping roof sections to preserve the homogeneity of the external form of the buildings. Their design allows users to move into a hitherto untapped space both in a close and distant context. The north segment and its terraces are suspended in the greenery of the Decius Park and in the wide landscape of the city, while terraces on the south side are exclusively landscaped. From the shape of the terrain and urban conditions, the "park" view will remain unchanged for years, while the "landscape" view of the south may be transformed by the possibility of building on plots at the southern side.

The building is made in reinforced concrete technology with layered walls which are insulated and finished on the eastern and western side with stone, while on the other side’s elevations are finished with thin-layer acrylic plaster. The cream-colored stone was imported from the Aleppo region in Syria according to the author's concept.
As in the previous project, the design strategy was to work on the form of a building based on structure and cross-section to achieve a homogeneous architectural form. The form is carved by means of shifts and incisions of the main mass of the building for the development of functional elements such as terraces, but also for lighting by means of natural light and such building elements as internal staircases. The final form is also an attempt at a creative dialogue with the conditions resulting from urban planning decisions that postulate the use of specific forms of roofs, lines, and height of buildings.

An important part of the project is understanding the typology of views from the inside and the reception of an external form in its urban context. The functional program is intended to give future users comfortable working and leisure conditions. The carefully designed details such as external stairs enhance the comfort of their users.

5. Conclusions
Comparative analysis of the discussed buildings shows the impact of culture on the shape of the form and function of the structures. The needs of users, creativity, and imagination, but also legal limitations set the framework for action. Speaking of the built environment, we cannot, however, ignore such an irrational factor in the memory of generations, which is commonly called tradition. In the selected examples which were discussed above, this is the tradition of one family acting in respect of shaping the environment in which they live. These activities are implemented at various times in a way that is optimal for them.

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14 Such as e.g., the right of fire in the case of buildings at Czarnowiejska St. or the need to use sloping roofs with a certain angle of incline in projects at Powstania Styczniowego St. and 28 lipca 1943 St