

UDC 711

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STREETS WITHOUT DOORS; A TWENTIETH CENTURY PHENOMENON?

Abstract: *Urban design practice over the last half-century has been dominated by the destruction of the street and the perimeter block followed by more recent efforts to resurrect them as the main elements of urban form. This process was clearly set out by Panerai et al in 1977 followed by its updated English translation of 2004 which documented the return to the street. Recent work on Nowa Huta has suggested that this was a simplification and that this New Town, where the first stage was built in the 1950s, represents an example of a type neglected in the literature. However, it was pointed out that in this interpretation of the neighbourhood unit, while there are streets, the apartments were all entered from inside the urban block – which raises the question as to whether they are really streets (in spite of the praise of New Urbanists) since there is no direct connection from the private realm of the dwelling to the city wide public realm of the street. Subsequent work noted similar forms in Austria, England, France and Italy. This paper discusses these experiences and the extent to which these designs relate to the social and political contexts that shaped them, contemporary gated communities in liberal market societies and historic forms such as monasteries and walled cities.*

Key Words: *housing, urban block, street, neighbourhood unit, urban form in interwar and post war Austria, England, France, Italy, Poland*

1. Introduction

For the last half century, arguably since the publication of Jane Jacobs seminal book, urban designers have been preoccupied with the recovery of the street as the basis for making towns. This was a reaction against the modernist paradigm emphatically advocated by Le Corbusier in his exhortation to kill the corridor street. In this desire to reclaim the street, those projects which went against the predominant grain by retaining streets are celebrated. In particular those which dated from post World War II when the predominant model for large scale housing was that of blocks set in landscape. An example is Nowa Huta New Town, built in the 1950s, based on an almost Baroque system of streets which is admired today by New Urbanists.

This paper is developed from a study presented at ISUF 2017 (Kantarek, Samuels, 2017) which examined Nowa Huta in the light of recent praise for its conformity with the precepts of New Urbanism. It focused on the configuration of the block system development and in particular it was noted that that there were no entrances to the apartment buildings leading directly off the streets. In a triangular block approximately 250 metres along its longest side almost all the entrances were on the inside i.e. the backs, of the buildings flanking the streets, towards the central shared space of the block. These were considered to be the private side of the building in most urban perimeter blocks in Europe until the twentieth century when it was replaced by a modernist form of development of free standing blocks in landscape. At Nowa Huta, within this

internal space, in addition to other apartment buildings, there were communal facilities such as schools or kindergartens. Each of the superblocks accommodated as many as a few thousand people so they are often referred to as a neighbourhoods thus inviting comparison with the Neighbourhood Unit as evolved in the United States and subsequently developed elsewhere, especially in the British New Towns.

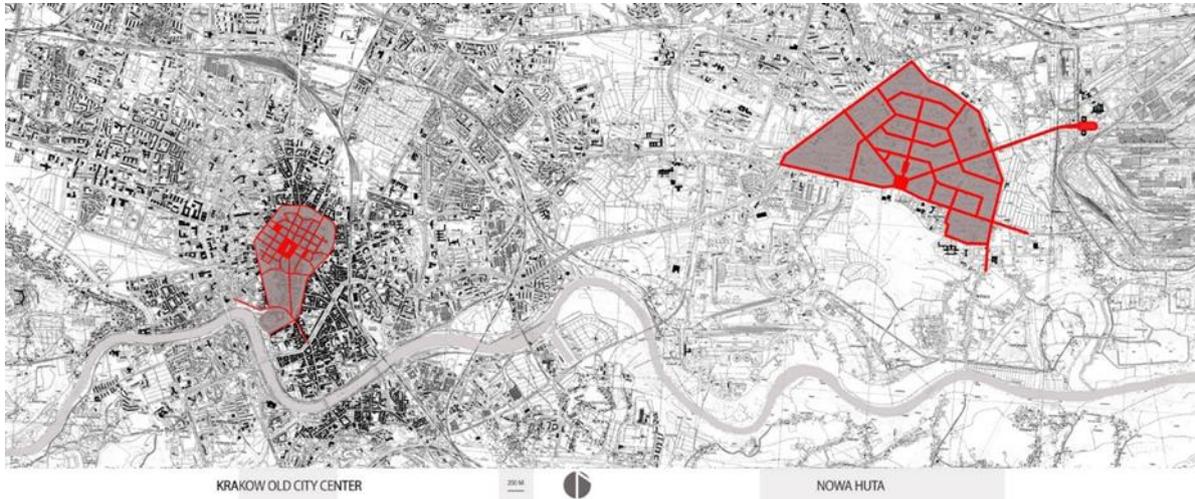


Figure 1. Nowa Huta location in Krakow [Kantarek, Samuels, 2017]



Figure 2. Neighbourhoods in the central part of Nowa Huta [Google Earth]

Subsequent to the presentation of the 2017 paper the authors became aware that this configuration is not peculiar to Nowa Huta but can be found in a number of earlier and contemporaneous projects in several European countries. Some points arose from these observations which will be examined under a number of themes in this paper.

First, the progression from urban perimeter block to separate building block so clearly set out in the 1977 book by Panerai et al, which includes Ernst May's iconic graphic representation of the stages of this evolution, is a simplification of the paradigmatic changes to urban form over the last hundred years and in practice that sequence is much more complex. Second, the extent to which this configuration is a form of social control which relates to certain socio-political contexts. Third, the historic origins of this form of urban development and finally how does it relate to current urban forms in particular the gated community.

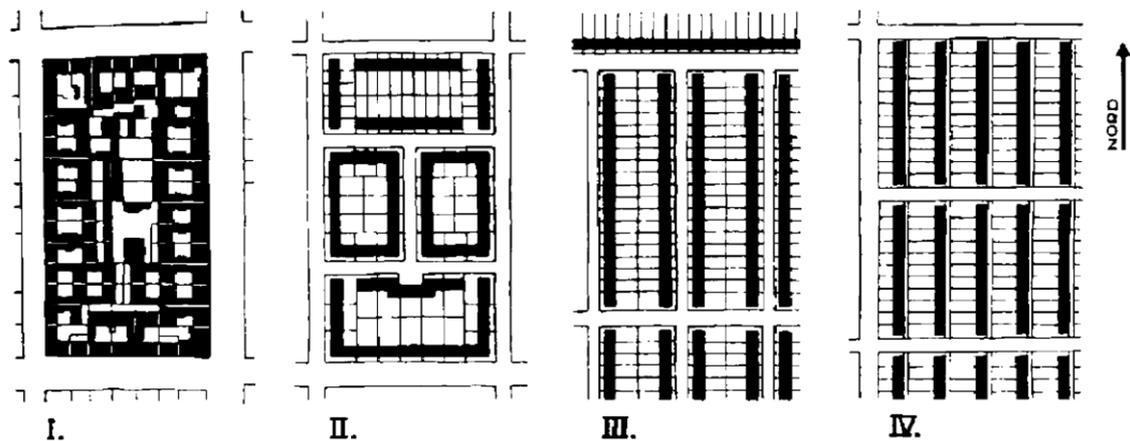


Figure 3. Ernst May interpretation of the dissolution of the perimeter block
(Panerai et al, 2004, 92)

2. Typological antecedents of Nowa Huta housing

These developments will be considered in approximately chronological order, with most of them dating from the period between the two World Wars. Many of them have a considerable bibliography and it is not the intention of this paper to repeat this material where it deals with the individual planning of the dwellings or their structural systems but only to set out the configurational characteristics of the examples and in particular their relationship to the surrounding streets. It is suggested that this aspect is neglected in the extensive writings on the topic. For example a book by Stieber (1998) chooses to discuss the Amsterdam Spaardamerburt in terms of dwelling plans and facades but does not mention the configuration of the entrances. More recently Poretto (2017) examines and compares the plans for housing in Vienna and Frankfurt in terms of the internal dwelling layout but only makes a passing reference to their relation to the street.

Although Nowa Huta dates from the Post World War II period of communist domination of Poland there are a number of strikingly similar housing projects in a wide range of European locations most of which were built between the Two World Wars in response to an acute housing shortage. A very brief overview revealed how often that courtyard type was used as a model for urban developments in a surprisingly wide variety of contexts. A few of these are discussed below but first some older antecedents of this inward-looking type of urban development are briefly described.

2.1. Monasteries, colleges and others

Tafari notes that the Viennese Hofe were based on “*the model of the barracks, the convent and cite ouvriere*” (1980, p. 29). These institutions are built around a closed courtyard or a connected series of courtyards which are accessed through one or more controlled entrances. Accommodation and shared facilities such as chapels or refectories are grouped around these courtyards or cloisters in the case of monasteries, quadrangles in colleges, derived from monasteries. Where they are inserted or have been incorporated by surrounding organic growth into urban areas they usually present blank walls to the surrounding streets, even though these walls may have windows or be decorated, as in the case of Queen’s College Oxford. The Belgian and Dutch Beguinages (whc.unesco.org/en/documents/129145) often consist of urban row houses surrounding a landscaped garden where a chapel, shared by all the members of the community, is located.

2.2. European interwar social housing

The post World War I housing shortage combined with municipal government reforms and the election of social democratic councils led to extensive social housing projects in several European countries. Many of these followed existing or planned street layouts and were

configured as perimeter blocks. It has been suggested that, with a few notable exceptions, they have been neglected in the urban design literature because they do not have “the imprint of CIAM” (Panerai et al., 2004, p. 36). Schemes in Amsterdam and Vienna are among these exceptions and this paper will only examine these and other less well known representative examples to the extent that they will help illuminate the theme of this paper.



Figure 4. Amsterdam Beguinage . The house are all entered from the courtyard but have windows overlooking the adjacent street [Google Earth]

2.2.1. Interwar Vienna - the Hofe

The Viennese experience from 1919 until 1934 was undoubtedly a major influence on housing in Europe (see below for some of the UK cities which used it as a model). In the 1920's the newly established Province of Vienna, dominated by a social democratic government, was to become a showpiece for new social housing. Until the fascist coup d'etat in 1934 the city built 400 projects which accommodated 64,000 dwellings. Of the projects built to resolve the critical shortage of housing and replace the cramped and unhygienic private housing stock, the Karl Marx Hof is undoubtedly the most spectacular and iconic but the other projects also used variously sized perimeter blocks which were adapted to the existing street networks even if, in some locations, existing streets have been suppressed in order to obtain a larger development block (Förster, n.d.).

The apartments are accommodated in blocks up to six storeys high enclosing an open space which, in the larger schemes, accommodates communal facilities such kindergartens, laundries, medical services etc. which compensated for the relatively small size of the flats. In all the Hofe the staircases which give access to a maximum of four flats on each floor are entered from the court, which is open to everyone. It therefore becomes an intermediate space between the street and the staircases. On main streets commercial units are sometimes located on the ground floor opening off the streets, which is the same arrangement as some of the blocks at Nowa Huta.

These blocks represent a new form of socialised urban living which offers living conditions which liberate their tenants from the clutches of private landlords and the poor housing conditions of the old city but in return impose a degree of uniformity and control.



Figure 5. Interwar housing developments along the Margaretengürtel (Outer Ring) shows how the perimeter blocks have been used to both adapt to the existing street network and create a variety of different sized Hofe, [Google Earth]

2.2.2. Interwar Italy - Villa Riccio

This lesser known Italian example is located between Via Stern and Via Donatello near the river Tiber. It was built in 1919 by the architect Negri for the Postelgrafonici Cooperative and covers the same area as three or four of the surrounding blocks (Corsini, 2018). The apartment buildings are three storeys high around the edge of the block which is 250 metres long by 150 metres wide approximately the same size as the blocks in Nowa Huta. However, there is no extensive open space because the centre of the block is occupied by lower apartment blocks which are laid out on an informal private route. It is clear from the intensity of development that the amount of building is far more than could be accommodated on blocks with streets. Is this a gated community avant le mot?

2.2.3 Interwar France - Square de l'Arve

To demonstrate the ubiquity of this type one French example is illustrated. The Square de l'Arve built in 1932 was rehabilitated between 1992 – 97 when blocks in the centre of the courts were demolished and two floors added to the existing structure. The entries from the courtyard have been retained so the perimeter block continues to present only windows and no doors to the surrounding streets. It was not considered necessary to revise this arrangement (Joffroy, 1999).

2.2.4. Interwar English Estates - Peabody Estates

The Peabody Trust was founded as a charity in 1862 and now owns 55,000 dwellings in London and the south east of England. Its Cleverley Estate built in 1928 and extended since then, partly as a result of World War II bomb damage is one example of the many constructed by the Trust. It clearly

demonstrates a control of movement by the elimination of all front doors onto the street with the access stairs to the flats reached from the central courts. This control was exerted until recent times by the use of gates which were closed at night. The much bigger Dalgarno Estate of 24 blocks is another interwar project which demonstrates a mixture of access from a private street, still clearly marked by gateposts and from the inner courts now used for car parking but not from the public street on the southern edge of the site (<https://www.peabody.org.uk>).

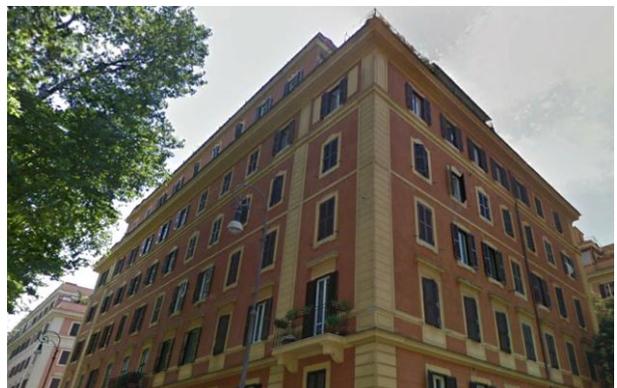


Figure 7. Villa Ricci, Rome, [Google Earth]

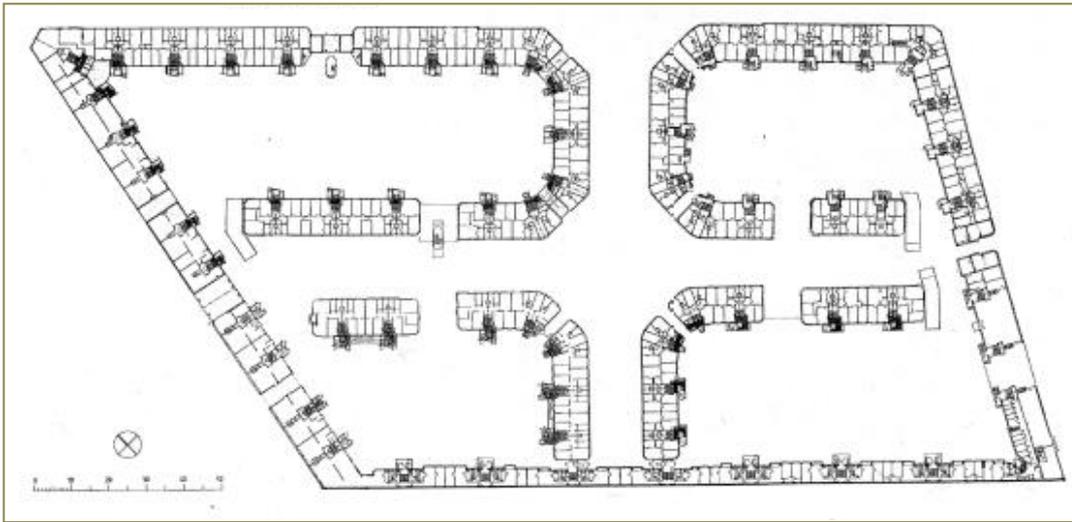


Figure 7. Square de l'Avre Housing Estate, Boulogne-Billancourt, Paris
a – plan [Joffroy, 1999]; b – street view [Google Earth]

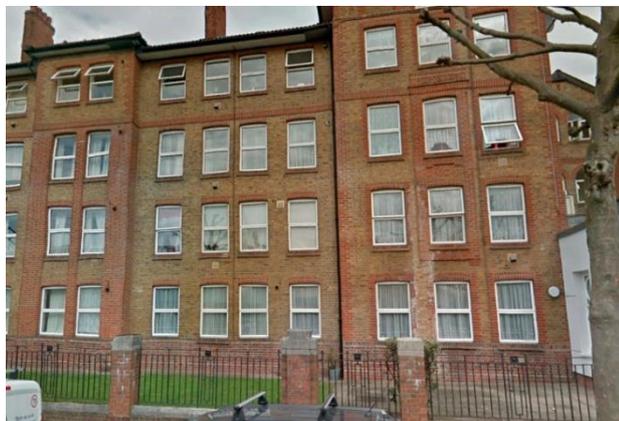


Figure 8. Dalgarno Estates, London [Google Earth]

3. Quarry Hill, Leeds

Building started in 1938 on this project of 900 flats near the city centre. At the time it was the largest social housing complex in Britain. It clearly owes its design concept to the Karl Marx Hof and it followed a visit by a Leeds delegation to Vienna in 1932. It was in direct contrast to the then predominant British housing model of the Garden City with low rise family houses. Quarry Hill also received criticism from another side because it rejected the parallel blocks of the then architectural *avant garde*, the *zeilenbau* orientated exclusively for maximum sunlight while ignoring the configuration of their urban context, which were being built in Weimar Germany at the time.

Quarry Hill was demolished in 1978 because the advanced (at the time) Mopin steel frame structure demanded too much maintenance and the Garchey system of waste disposal had ceased to function properly. It was replaced by a complex accommodating the offices of different public agencies.

With a low site coverage of 14% the site was laid out as a system of perimeter blocks which backed onto and followed the line of the surrounding streets. There were some parallel blocks in the interior. All the apartments were accessed from staircases which opened off courtyards which had a limited number of entry points from the surrounding streets. The range of facilities planned for these courtyards – playgrounds, nurseries, a swimming pool, medical facilities, were never built although a handful of shops eventually opened. Vehicle access was allowed into the courts and this was to prove another point of dissatisfaction since these were eventually used by non – residents as a car park for the city centre.

Ravetz (1974) has carefully documented the design and implementation of the project, and suggests that it demonstrates “a belief in community and that a fragmented society could be made whole through architecture alone” (Ravetz, 1974, p. IX).

4. Current Models – Residenze Hadid and Liebeskind, Milan

Current models known as *gated communities* are not only problem of suburban tissue. The Milanese example of two adjacent developments designed by star architects whose names are used as part of a marketing strategy, ignore the surrounding existing nineteenth century urban tissue. They are entered by gates and enclosed by steel fences which also enclose the pedestrian routes which traverse each scheme. Although these are transparent, because of the disposition the buildings they offer little if any surveillance of these pedestrian routes or of the surrounding streets.

5. Rzeźnicza Street, Krakow – a hybrid reality

The area of Rzeźnicza Street in Krakow has a very interesting history of urban development and presents today a remarkable example of hybrid urban form. The role of the street in shaping the urban structure of this part of the city is important since it leads from the main street of the district (Grzegórzecka Street) towards the municipal slaughterhouse built in 1878 and follows an even earlier route. It became the basis for the subdivision of the surrounding areas by cross streets and plot subdivisions for further development and became a link between Grzegórzecka Street and the railway station located next to the River Vistula. The railway station square was created at the junction between Rzeźnicza and Podgórska Streets with entrances to the railway station buildings and in the proximity of entrances to the slaughterhouse and the market square. Thus Rzeźnicza Street along its length had active building fronts to the plots of land on its northern side with the blank walls of the separate functions of the slaughterhouse and marketplace.

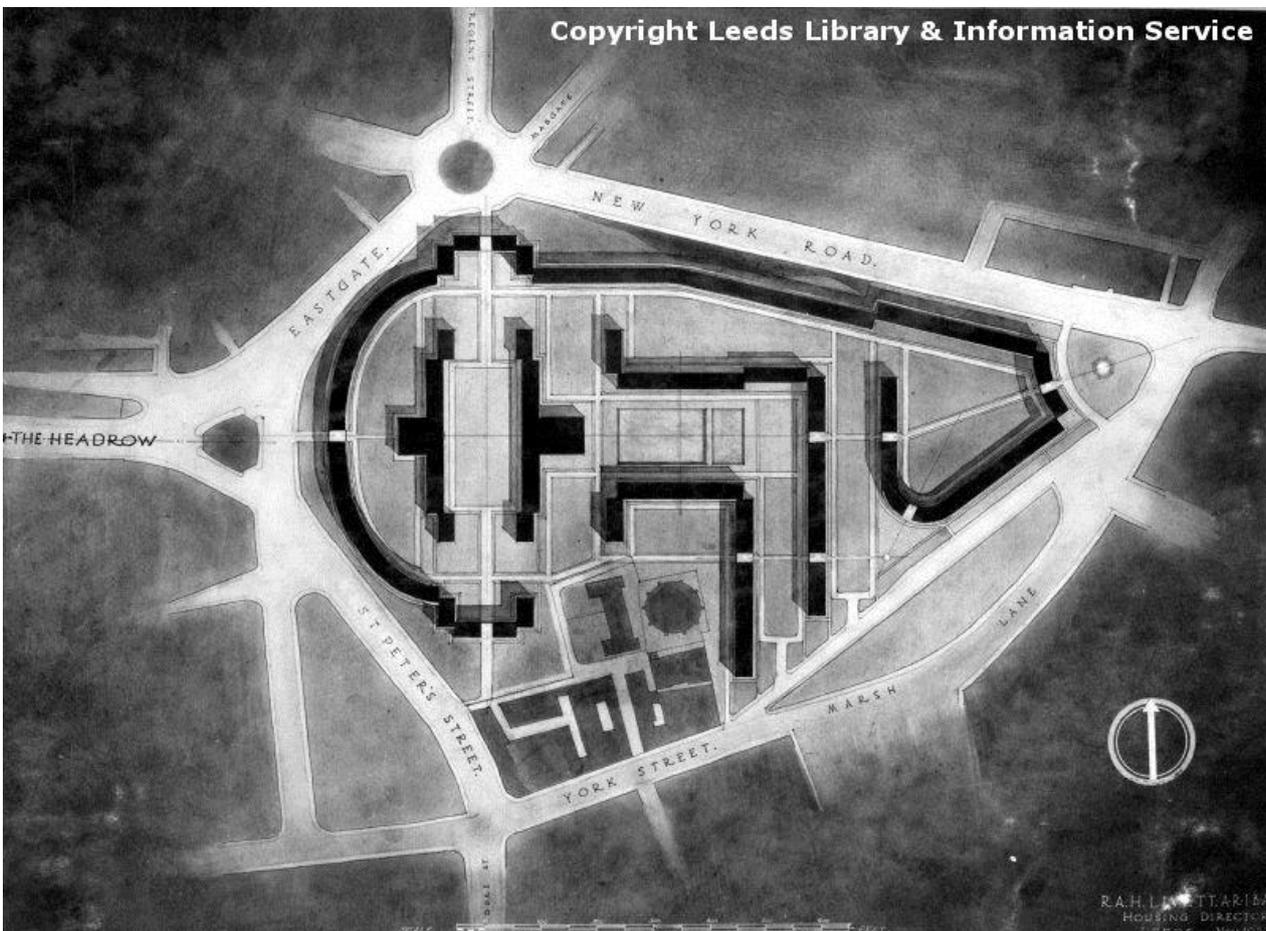


Figure 10. Quarry Hill Housing Estate, Leeds [https://municipaldreams.wordpress.com/2013/02/]; a – model [https://fet.uwe.ac.uk/conweb/house_ages/ch_QuarryHillModel.jpg]; b – view [https://en.wikipedia.org/wiki/Quarry_Hill,_Leeds]; c – plan [https://fet.uwe.ac.uk/conweb/house_ages/ch_QuarryHillPlan.jpg]

In the post-war period, further changes took place. The course of the street together with the areas located on its eastern part was developed as a social realist style housing estate. While these buildings lined the street in a similar way to the other buildings which completed Grzegórzecka Street, as residential buildings they prioritized their basic residential connections within the separate large urban blocks. The entrances to most of the residential buildings are not from the

street but from the block interior. The number of ground floor non residential functions on streets, with entrances and car access located either between buildings or through gates leading under the buildings. Furthermore, the buildings located on the eastern side of the area, and today's Kotlarska Street have only windows on the eastern elevations and no entrances. Some infill of the street structure was carried out in the 1970s and 1980s – at the corner with Masarska Street and in the interior between Grzegórzecka Street and Prochowa Street.



Fig. 10. Residence Hadid and Liebeskind, Milan: a – general view [Google Earth];
b – Residence Hadid [photo by I. Samuels]; c – Residence Hadid [photo by I. Samuels]

With the filling in of the old Vistula riverbed in the 1920s, and the demarcation of the transportation artery along the line of the former river to connect with Podgórska Street, the gradual removal of the station and railway line which was completed in 1980, and enlargement of the slaughterhouse area by the adjacent marketplace, Rzeźnicza Street took on a local, less important character.

The Municipal Slaughterhouse operated until 2003 and in its place the Kazimierz shopping center was established. At the beginning of the 21st century, further areas between the former slaughterhouse, Rzeźnicza Street and Kotlarska Street have been the subject of transformation. On the plot divisions resulting from the historical subdivisions the land was built up mainly for residential uses with some office and hotels.

An analysis of the current situation indicates, within a relatively small area, a variety of different ways of shaping the relation of private and public space with different degrees of frontage activity, entries into buildings and the internal spaces of plots and blocks, as well as accessibility and views into these interior spaces.

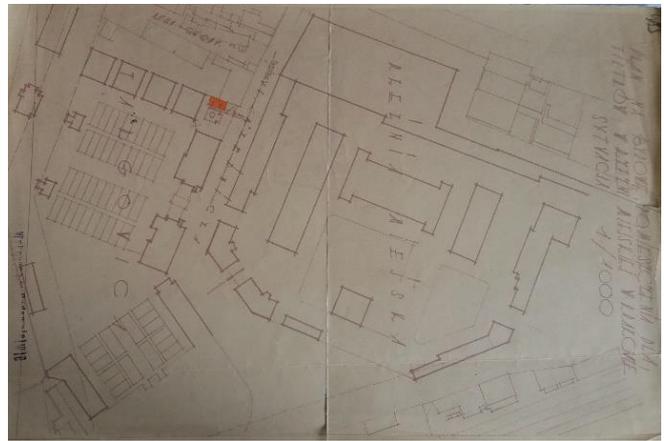


Figure 11. The Municipal Slaughterhouse area; a – before 1878, b – 1958
[The National Archives in Krakow, Dep. V]

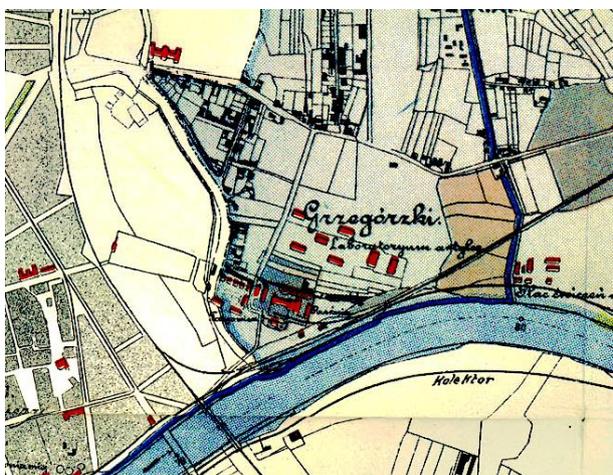


Figure 12

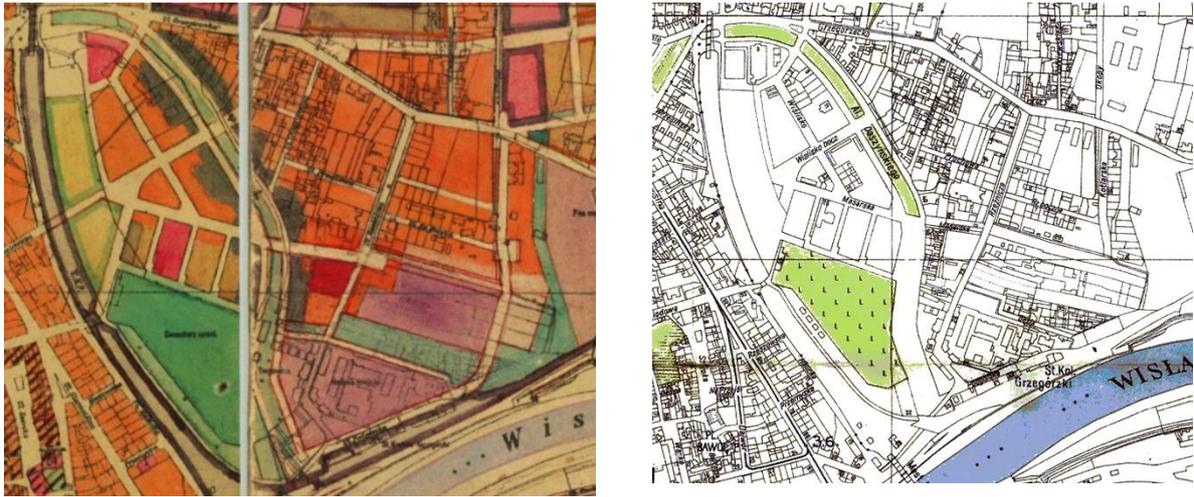


Figure 12. Rzeźnicza Street and The Municipal Slaughterhouse area (fragments of maps): a – 1912, [Atlas historyczny miast polskich. Kraków. Society of Friends of History and Monuments of Cracow, Cracow, 2007, (V.1.2007) 1.27]; b – 1934 [http://przypadkiadama.com/mapy/1934d.png]; c – 1939, Project of Plan of Regulations, http://planowanie.um.krakow.pl/bppzoom/index.php?ID=245]; d – 1947 [http://przypadkiadama.com/mapy/1947b.png]



Figure 13. The Municipal Slaughterhouse area in transformations.
Google Earth views – 2003, 2007, 2013, 2017

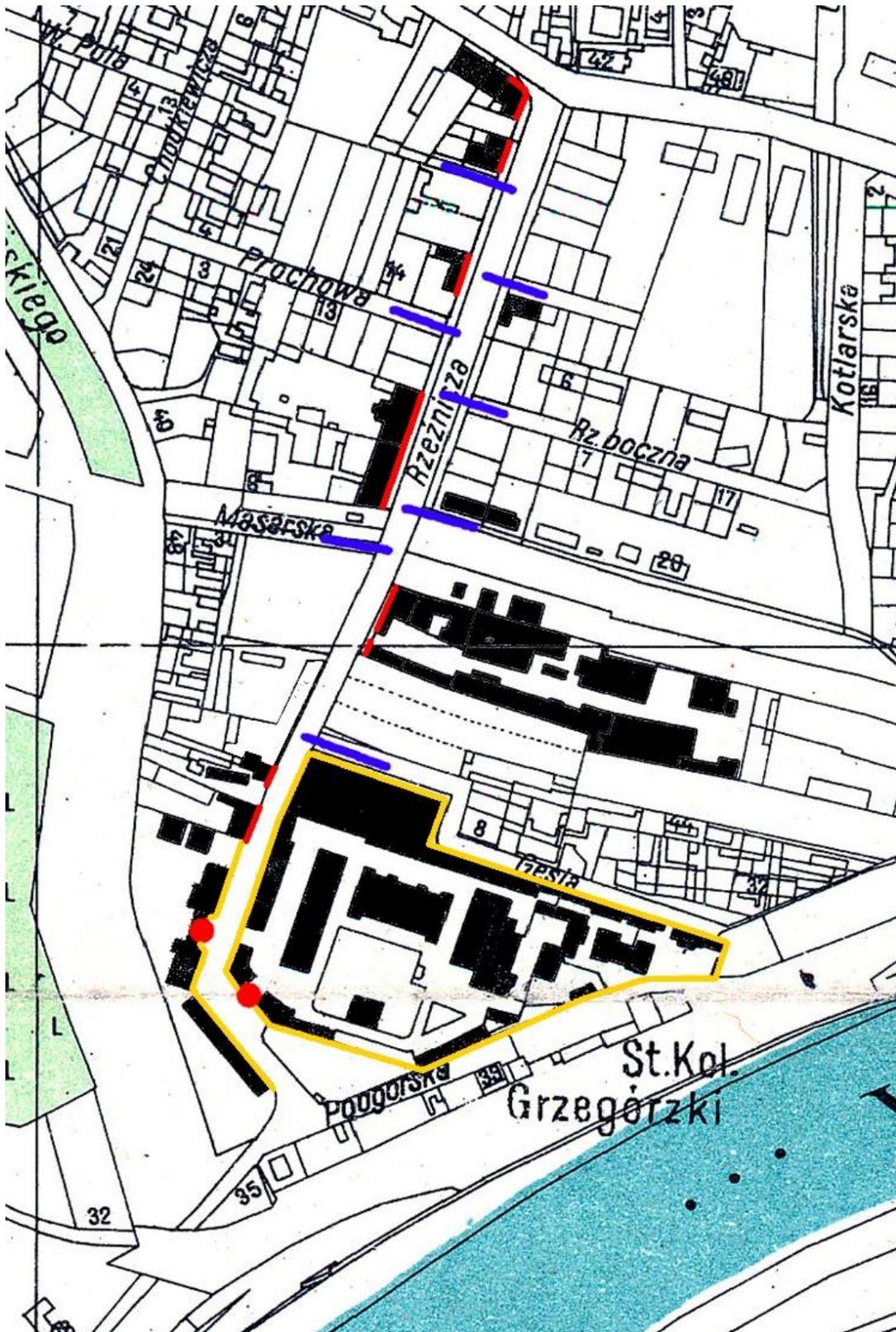


Figure 14. Rzeźnicza Street, 1947: red dots – entrances and entries (market, slaughterhouse); red line – built-up street and plot line with entrances; yellow line – blind street elevations of market and slaughterhouse; blue line – street crossed to Rzeźnicza St. [A.A. Kantarek on map from 1947]



Figure 15. Plan of the area showing the variety of uses and entry arrangements: brown – buildings built before II WW; ore – socialist buildings; orange – buildings from 60s, 70s, 80s and 90s of the 20th century; yellow – new buildings (21st century); grey – garages, temporary buildings or buildings with an undetermined date of construction; white – buildings out of range [A. A. Kantarek on map from <http://obserwatorium.um.krakow.pl/obserwatorium/kompozycje/?config=config.json>]

6. Street without doors tissue. Notes for discussion

The neglect of this type of urban form prevalent in so many versions is striking. Its absence from the widely quoted Ernst May diagram of the dissolution of the urban block has already been noted, but there is also a neglect of this type in the general literature on modern post World War I architecture. When they are mentioned it is generally the aesthetics of the architecture and perhaps the planning of the individual dwellings which is discussed and rarely if at all the configuration of the blocks, their relation with the street, the access arrangements and the disposition of the public realm in relation to private spaces – i.e. the urban design aspects.

It is notable that the detailed studies of these projects virtually ignore what to urban designers today seem to be a very negative aspect of their design – the restriction to a small number of the entrances from the surrounding streets. Ravetz (1974) does not mention this at all and Blau (1999) celebrates what she terms the ambiguity and richness of the progression from public street to semi private yet widely accessible court, to private stair and finally the apartment. This form is clearly capable of regulating the life of the community. Gruber (1991, p. 58) notes that in the Vienna projects the housing management issued directives controlling many aspects of daily life e.g. when rugs could be beaten and when and where children could play – families were disciplined for allowing their children to play on grassed areas. He also ventures a questioning note by stating that the inward turning configuration is *both protecting and excluding*.

At Quarry Hill the individual dwellings were liked while it was the public space and access arrangements which were criticised. As one tenant observed:

I remember walking through the Quarry Hill development in the mid-70s. It felt deserted and barren. I was nervous about walking through it, because it had a bad reputation. It seems to me that it failed – not because of the buildings themselves – but because architects fail to realise that you cannot cage people and expect them to like being cut off from the rest of the city by their own dwellings, which acted as walls.

David Edge, Municipal Dreams (2013) *Municipaldreams.wordpress.com*

As architecture the Viennese social housing, the *Gemeindebauten*, received much criticism from the start of the programme, in particular from the German *avant garde*. These were the architects of the *Zeilenbauten*, those parallel blocks which, unlike the *Hofe*, ignored the street pattern and following May's diagram, were orientated for maximum sunlight in parallel rows. They were also criticised for their load bearing wall construction, as opposed to modern systems of prefabrication, and the way they were detailed with sculpture and painted decoration (Blau, 1999). In other words, they did not accord with the tenets of the emerging International Style. They were considered to be:

an eclectic architecture of compromise, heterodox, self-reflexive (sic), cut off from, and seemingly unaware of, the larger discourse of modernism in European architectural culture.

(Blau, 1999, p. 8)

Yet it has been noted above how influential they were as a model – at least in Britain.

Perhaps different eras ask different questions. Today when we are trying to reconstruct streets after two generations have done their best to follow le Corbusier's dictum, we are questioning that aspect of this type of urban tissue. Of course the type has to be understood in its socio/historical context. The monasteries, beguinages and colleges are communities which were, and in some cases still are, shut off to a more or less degree from the societies and urban areas which surround them. This form therefore has its origins as a type of control mechanism. In the case of the interwar housing and Nowa Huta the intention seems to have been to create a proletarian community with a distinct image which shared basic facilities located inside the block. But this also implies a degree of control of movement into the common courtyard through a limited number of entrances. This type also contradicts the century old progression in European urban housing from public street to private internal space.

Although they are often referred to as neighbourhood units these blocks also contradict the configuration of the original neighbourhood unit where commercial facilities were intended to be shared by being located between neighbourhoods. This centralisation of all facilities within the courtyards in fact renders the viability of commercial units difficult, as happened in Quarry Hill. At Nowa Huta this problem is recognised by locating commercial activities along the street frontages.

In housing most day to day informal contacts take place between neighbours and these would take place to the same extent through the staircase entrances facing the courtyard. However wider informal contacts outside the community would not take place as has been noted at Quarry Hill.

Finally the contemporary gated community, of which only one example has been cited, seems to be devised to construct a community for the sole purpose of marketing the development and controlling access by non-residents. They are not necessarily constructed to form an identifiable community except for limited leisure facilities such as a swimming pool or saunas. Not only do they shut off the residents from the rest of the city by the use of a gate, but the disposition of the dwellings inside the block often does not allow any informal surveillance of the surrounding streets – thus exacerbating problems of urban security which is presumably the main justification for a gated community. It is the twenty first century equivalent of the medieval monastery or contemporary Oxford college – worse than these because colleges are open to visitors for part of the day.

If gated communities are to be built then they should be buried inside blocks and surrounded by outward facing units as in the Turnhout Beguinage above. A less ambitious modification would be to copy those Beguinages or the Peabody buildings described above where, although there are limited and controlled street entrances, there are also windows overlooking the public spaces. Streets without doors are certainly not a twentieth century invention but its current manifestation as the gated community is hardly a model for the twenty first century with its diverse societies which must become more inclusive if they are to survive.

Urban designers have to recognise that incorporating streets into their projects is not enough!



Figure 16. The Turnhout Beguinage hidden in the urban block,
[<http://whc.unesco.org/fr/documents/101181>]

References

1. *Atlas historyczny miast polskich. Kraków*. Society of Friends of History and Monuments of Cracow, Cracow, 2007 (V.1.2007)
2. Aurelli, P.V. (2011) 'City as Political Form: Four Archetypes of Urban Transformation', *Architectural Design* 81 (1), 32–37.
3. Blau, E. (1999) *The Architecture of Red Vienna 1919-1934*. (The MIT Press. Cambridge, London)
4. Casciato, M. (1996) *The Amsterdam school* (010 Publishers, Rotterdam).
5. Casciato, M. and de Wit, W. (1984) *Le case Eigen Haard di De Klerk* (Officina Edizioni, Rome).
6. Castex, J. Depaule, C. Panerai, P. (1977) *Formes urbaines: de l'ilot à la barre* (Bordas, Paris).
7. Corsini, M.G. (2018) 'Personal communication'.
8. Gruber, H (1991) *Red Vienna: Experiment in Working Class Culture 1919-1934* (Oxford University Press, Oxford).
9. Joffroy, P. (1999) *La réhabilitation des bâtiments* (Editions Le Moniteur, Paris).
10. Kantarek, A.A., Samuels, I. (2017) 'Nowa Huta, Krakow, Poland: Old Urbanism, New Urbanism?', *ISUF Valencia Conference Paper*.
11. Map of Cracow, 1912, *Atlas historyczny miast polskich. Kraków*. Society of Friends of History and Monuments of Cracow, Cracow, 2007, (V.1.2007) 1.27.
12. Municipal Dreams (2013) *Quarry Hill Flats, Leeds; 'They Didn't Get It Wrong – Well Not for Me Anyway'*. Available at: <https://municipaldreams.wordpress.com/2013/02/> (Accessed 20 February 2018).
13. Panerai, P., Castex, J., Depaule, J.C., Samuels, I. (2004) *Urban Forms; the Death and Life of the Urban Block* (Architectural Press, Abingdon).
14. Porotto, A. (2017) 'Kleinwohnung vs Existenzminimum: Social Housing Types from Inter-war Years', *ATINERS Athens, Conference Paper Series, No: ARC2017-2315*.
15. Ravetz, A. (1974) *Model Estate, Planned Housing at Quarry Hill, Leeds* (Croom Helm, London).
16. Steiber, N. (1998) *Housing Design and Society in Amsterdam. Reconfiguring Urban Order and Identity, 1900- 1920* (University of Chicago Press, Chicago).
17. Supranowicz, E. (1995) *Nazwy ulic Krakowa* (Instytut Języka Polskiego PAN, Kraków).
18. Tafuri, M. (1980) *Vienna Rossa. la politica residenziale nella Vienna socialista, 1919-1933* (Electa, Milano).
19. *The Municipal Slaughterhouse Area before 1878 – map* (The National Archives in Krakow, Dep. V)
20. *The Municipal Slaughterhouse in 1958 – map* (The National Archives in Krakow, Dep. V)
21. UNESCO (1998) *Flemish Beguinages* whc.unesco.org/855

Internet sites

1. Google Earth
2. <http://przypadkiadama.com/mapy/1934d.png> (Accessed 23 April 2018)
3. <http://planowanie.um.krakow.pl/bppzoom/index.php?ID=245> (Accessed 23 April 2018)
4. <http://przypadkiadama.com/mapy/1947b.png> (Accessed 23 April 2018)
5. <https://www.peabody.org.uk> (Accessed 23 April 2018)
6. whc.unesco.org/en/documents/129145 (Accessed 23 April 2018)
7. https://fet.uwe.ac.uk/conweb/house_ages/ch_QuarryHillModel.jpg (Accessed 23 April 2018)
8. https://fet.uwe.ac.uk/conweb/house_ages/ch_QuarryHillPlan.jpg (Accessed 23.04.2018)
9. https://en.wikipedia.org/wiki/Quarry_Hill,_Leeds (Accessed 23 April 2018)
10. <http://whc.unesco.org/fr/documents/101181> (Accessed 23 April 2018)
11. <http://obserwatorium.um.krakow.pl/obserwatorium/kompozycje/?config=config.json> (Accessed 23 April 2018)
12. SunderlandGarths, <http://www.thecannyspace.co.uk/garthpagegallery/pages/2015-07-0609.39.41.html> (Accessed 21 February 2018)
13. Förster, W. (no date) *80 years of social housing in Vienna*. <http://wien.gv.at/englishhousing/promotion/pdfsocialhaus.pdf> (Accessed 21 February 2018)