Sustainable Dwelling

Between Spatial Polyvalence and Residents' Empowerment

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Foreword by Herman Hertzberger

Dwelling past the limits of housing

Housing facing the individualization of society,
the cases of Kalkbreite and La Sécherie

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In the context of our societies' increasing individualization,
dwelling has developed into a largely personal pursuit.
Hence, housing can no longer be considered exclusively
from a traditional household perspective.

Given this context, a combined analysis – both spatial
and social – of several housing projects was carried
out by researchers in architecture and the humanities.
Two projects – La Sécherie in Nantes and Kalkbreite
in Zurich – were selected for their use of a particular
conception principle: 'reduction and extension'. This
principle implies organizing a dwelling between two poles:
a reduced domestic nucleus and a series of additional
spaces. Based on this principle, a multiplicity of dwelling
configurations can be imagined. All are grounded in the
idea that the act of residing could take place beyond
the traditional limits of housing. Combined with a spatial
analysis, a post-occupancy exploration was carried out
in both projects, shedding light on the constraints but also
the potential of the 'reduction and extension' principle.

The benefits of this 'reduction and extension' principle are
twofold. First, dwelling can evolve given the constellation
of possible housing configurations. Second, inhabitants
are able to make their own dwelling choices. This
combination of domestic polyvalence and dwellers'
empowerment is a key to sustainable housing designs.

'*In any household forms, only one aspect counts, that is, adjusting the relationship between an individual and other(s), and maybe the fact that this individual claims a growing attention, a consequence of individualization concerning our society (that is our western and industrial society). This aspect does not contradict the search for more communicative housing forms: individualism is not claiming loneliness but rather controlling the relation degree with others.*'

Zurbuchen, Bernard[1]

Context: individualization

Nowadays, an increasing number of people live alone. The proportion of one-person households has grown exponentially ever since the Second World War.[2]

This trend affects mainly developed countries in Europe, Japan and North America.[3] In these single households, a vast majority are elderly people. In addition, it is essentially an urban phenomenon.[4] In large cities such as Berlin, Copenhagen, Amsterdam and Helsinki, nearly every other household is single.[5]

↑
Share of single households in the USA
(source: US Census Current Population Report 2012)

↓
Evolution of the share of children living in a reconstituted family in France
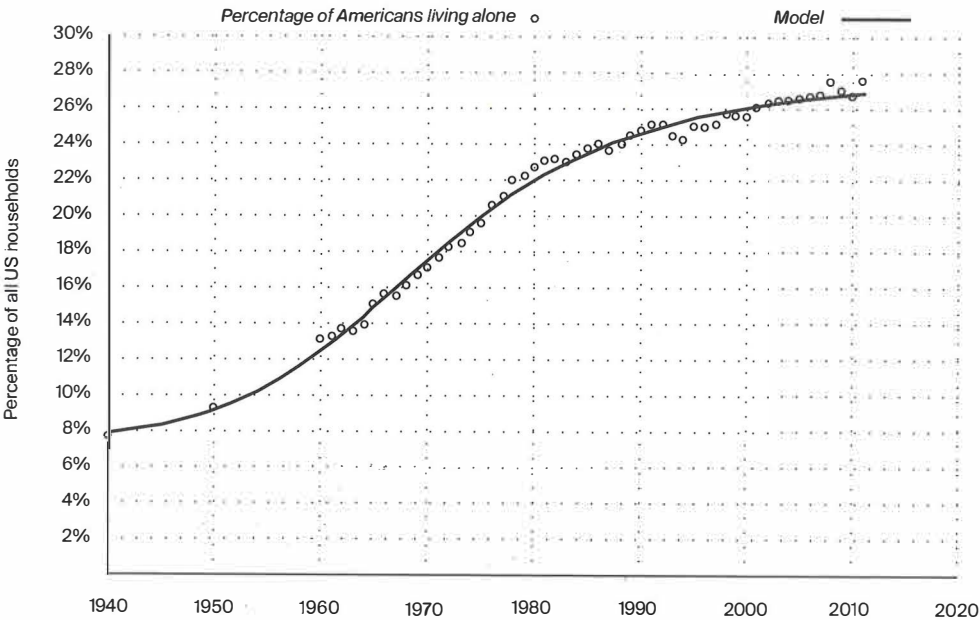(source: INSEE 2012)

1.
"*Dans toutes les formes de ménage, il n'y a qu'un seul fait qui compte, c'est le réglage du rapport entre un individu et le ou les autres, et peut-être le fait que cet individu réclame une place croissante, conséquence de l'individualisation qui caractérise la société (c'est-à-dire notre société occidentale et industrielle). Ce fait n'est pas en contradiction avec la recherche de formes d'habitation plus communicatives: l'individualisme ne réclame pas la solitude mais le contrôle du degré de relation avec les autres.*", in Lucan, J., Marchand B. and Steinmann, M. (2000) *Construire des logements: l'habitat collectif suisse 1950-2000*, Lausanne: Presses Polytechniques et Universitaires Romandes, p. 24.

2.
Figures show an evolution from 3% in the 1950s to an average 30% nowadays, McRae, S. (1999) *Changing Britain: Families and Households in the 1990s*, Oxford: Oxford University Press, 265-268.

3.
OECD figures show major disparities between Northern Europe and Southern countries: '*Single-person households constitute around 40% of households in Estonia, Finland, and Norway. By contrast, this proportion is around 20% in Portugal and less than 10% in Mexico.*' Database, O. F. (2016) Family size and household composition, OECD.
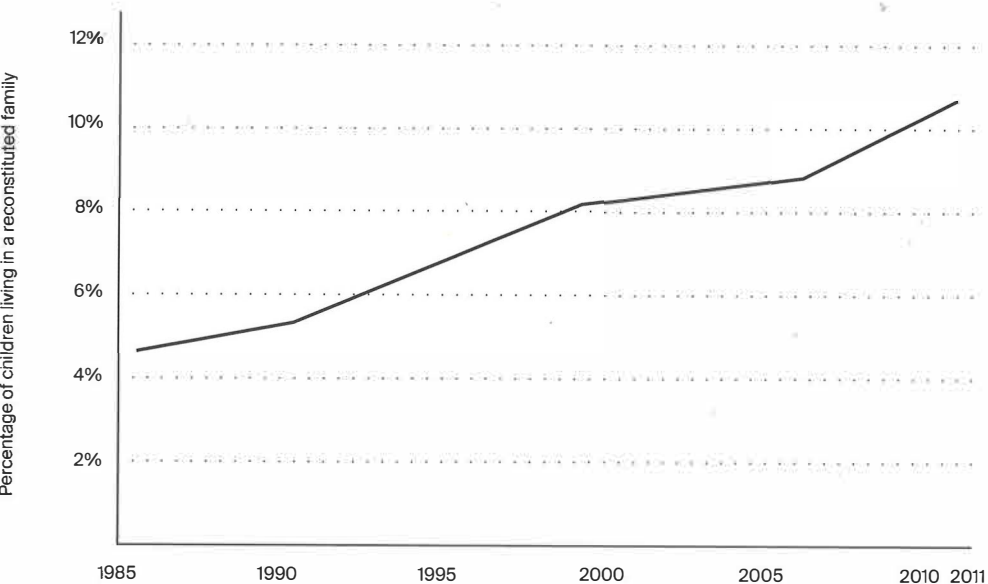
4.
McRae, S. (1999) *Changing Britain: Families and Households in the 1990s*, Oxford: Oxford University Press, 270-277.

5.
Kotzeva, M. (2016) *Urban Europe - Statistics on cities, towns and suburbs*, Luxembourg, 9-11.

This condition can be either chosen or imposed. Indeed, while some people make the deliberate choice to live alone (young professionals, etc.), in which case it is often transitory, others have no choice but to live a solitary life (elderly, disabled people, etc.).
In addition to this transformation, there is a growing diversity in families' configurations (cohabitation, separate living, step-parents, single-parent households, etc.). The diversity of our *separating and divorcing societies*[6] leads to a multiplication of individual trajectories. The variety is marked on a lifelong scale since there is no longer a common life pattern shared broadly by society.[7] Moreover, personal trajectories also tend to fluctuate on a day-to-day basis. For instance, the weekly schedule of reconstituted families varies a lot from one week to the other.

As a consequence of these sociological changes, dwelling trajectories have become increasingly individual. The nuclear family can no longer be regarded as the sole basis of our Western societies. From the end of the 19th century, the modernist ideology has considered the nuclear family (parents and children) the central unit of the social order and a protective and safe environment. Urban and architectural configurations have been conceived from this particular perspective.[8] However, various forms of households (from extended family[9] to solitary individuals) have persisted.[10] Nowadays, there is a growing range of life trajectories, and often the nuclear family no longer predominates. Hence, in many cases, dwelling develops as an individual pursuit.

Individualization and housing

These sociological changes have a significant impact on housing standards. Indeed, most of our housing stock is based on the traditional household's composition. Hence, past conceptions of housing structures increasingly fail to accommodate new ways of life.

Since the impact of individualization on housing affects both social and spatial matters, an interdisciplinary approach that combined scholars in architecture and socio-anthropology was established. First, two European cities were selected for their ambition to 'reconsider' housing approaches: Nantes and Zurich. Nantes has received much attention for its most recent developments on the Ile de Nantes, but also in its suburbs.[11] In the past two decades, Zurich has also produced numerous innovative housing projects that claim unambiguously to do 'more than housing',[12] mainly at the initiative of housing cooperatives.

Second, a team of researchers in architecture and the humanities analysed a series of collective housing projects.[13] The analysis methodology was twofold. From an architectural point of view, innovative collective projects were selected in both cities and subjected to a thorough spatial analysis. All spatial propositions were studied by means of a typo-morphological analysis (space proportion, hierarchy, spatial relations, composition, etc.).[14] In addition to this typo-morphological analysis, interviews were carried out with the projects' architects and the urban planners to comprehend

6.
As stated by de Singly, F. (2009) *Libres ensemble. L'individualisme dans la vie commune,* Saint-Amand-Montrond: Nathan, p. 384.

7.
Allan, G. and Crow, G. (2001) *Families, Households and Society,* Basingstoke: Macmillan Education UK.

8.
Eleb, M. (1999) *L'invention de l'habitation moderne, Paris 1880-1914,* Paris: Hazan ; Hall, E. T. (1966) *The Hidden Dimension,* New York : Anchor Books Editions.

9.
Young, M. D. and Willmott, P. (1957) *Family and Kinship in East London,* London: Routledge and Kegan Paul.

10.
Godelier, M. (2010) 'Systèmes de parenté, formes de famille. Quelques problèmes contemporains qui se posent en Europe occidentale et en Euro-Amérique', *La revue lacanienne,* 3(8), 37-48.

11.
Regarded by some as a green city or even as the most liveable city in Europe. Masson, P., Cartier, M., Saout, R., Retière, J.-N. and Suteau, M. (2015) *Sociologie de Nantes,* Paris: La Découverte.

12.
Mehr als Wohnen is one of the latest achievements of a combination of several cooperatives in Zurich. Hugentobler, M., Hofer, A. and Simmendinger, P. (2015) *More than Housing: Cooperative Planning - A Case Study in Zurich,* Basel: Birkhäuser.

13.
Their research activities were funded by the Christian Leleux Grant 2015-2016.

14.
For this purpose, all projects were redrawn with the same graphic codes in order to be able to compare them objectively.

their attitude regarding housing. From a social point of view, extended stays (one week for each city in July 2016) took place in two of the selected projects, which allowed researchers to make field observations as well as conduct interviews[15] with residents and various stakeholders (project developers, academic researchers, etc.). Inhabitants were met door-to-door in Nantes, while they were met directly in communal spaces in Zurich. Ten to fifteen interviews of about one and a half hours were carried out with inhabitants in both projects, in their apartments. At the end of each meeting, the interviewees were asked to draw their dwelling.

The research outcomes are reported in a catalogue that combines spatial analysis and post-occupancy evaluation.

Spatial analysis: reduction/extension

Two of the analysed projects are based on similar composition principles: reduction and extension. In both cases, spatial determinants are reduced to a minimum in order to provide the dweller with a series of potential dwelling extensions.

La Sécherie: a collection of rooms

'La Sécherie' is a project built by *Boskop architectes* in 2008. It is set in the suburbs of Nantes, in the Bottière-Chénaie development zone.

The project is based on several principles. First, it provides a porous interface between a residential area and a new park. Second, the project is designed as a *'collection of rooms'*.[16] The basic unit of the project is the dwelling room.All these rooms are alike in their initial design and have an area of four by four meters. In addition, the rooms do not present any predetermined function.[17]

15.
The interviewing method is based on the 'comprehensive approach' by Kaufmann. Kaufmann, J.-C. (2011) *L'entretien compréhensif*, Paris: Armand Colin.

16.
Statement by the architect. Interview with Sophie Delhay, Lille, July 2016.

17.
However, further development of the project led to more room specifications (e.g. the kitchens).

NOM	Sacchi
PRENOM	Thomas
AGE	45 ans
SITUATION FAMILIALE	Homme marié
PROFESSION	Hôcellerie
ARRIVEE DANS LE LOGEMENT	2008
HABITATION PRECEDENTE	René Corty – HLM – T4 – appartement. Grand immeuble – 10 étages
SURFACE LOGEMENT	84 m2
TYPE DE LOGEMENT	T4 – RDC avec cour
SPECIFICITE	Petite cour avec pièce en plus. Petite terrasse à l'étage qui donne sur la chambre. Impasse avec 3 entrées de logement. Beaucoup de travaux d'aménagement réalisés par la locataire (sol, cuisine, terrasse en bois, etc)
TYPE D'OPERATION	HLM
LIEU	France-Nantes-quartier La Bottières
LOYER	495 euros (+150 euros HLF)

Le collectif

Concernant la terrasse commune

Elle est au 1er étage et donne sur la chambre pour l'instant (Véronique souhaite transformer cette pièce en salon et profiter d'avantage de la lumière et de la terrasse).
Conflits d'usage de cet espace avec les voisins (on ne les connaît pas puisqu'ils n'ont pas la même entrée) qui laissent trop d'objets dans l'espace
Porte opaque en venant de chez Véronique, porte fenêtre chez les voisins
Souhaite réaliser une séparation et diviser la terrasse en 2
Les voisins que l'on connaît le mieux sont ceux avec qui on partage la même entrée
Avant l'arrivée de ces nouveaux locataires, jamais de souci. Véronique utilisait la terrasse commune pour faire pendre son linge.

Chloé : « De mettre une séparation sur la terrasse commune »

Véronique : « Oui, oui, genre glostra (?) vous savez ?
Quelque chose comme ça. Parce que là ils ont envahi la terrasse donc du coup… On a pas accès. Alors c'est soit on rentre en conflit ou euh… Pour l'instant je laisse courir pour cette année, je verrai ça l'année prochaine. »

Gérald : Vous avez une chambre, une pièce qui donne dessus du coup ?

Véronique : Ouais l'ai une chambre ouais.

Chloé : ça fait pas trop de bruit alors ?

Véronique : Nan, nan mais surtout… Y a un banc de muscu, enfin y en a partout…

Gérald : Ah oui ok bien alors on l'a vu je pense.

Chloé : C'est un peu trop quoi ?

Véronique : Ouais.

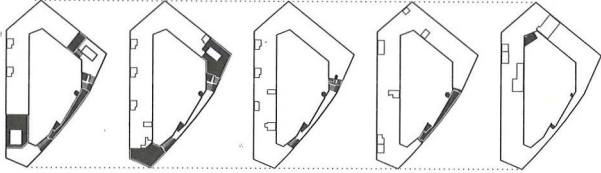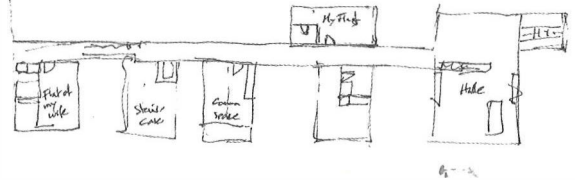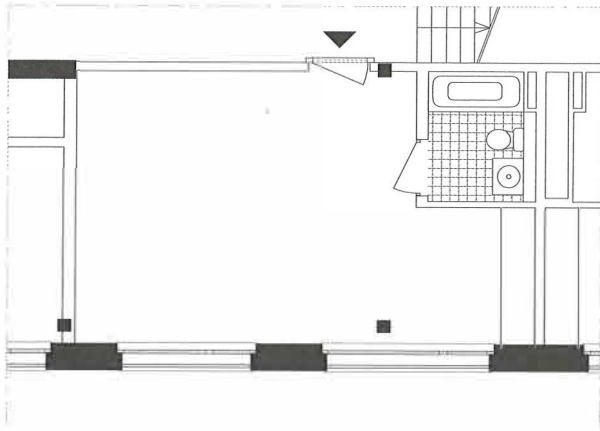Gérald : Vous ne faites pas de muscu (rires) ?

Conflits

V : Ah ben je reçois quand même l'hiver, J'enlève la table basse, je mets la table dans le salon. C'est pour ça d'ailleurs que je veux une séparation du balcon là-haut quand j'aurais le salon en haut pour pouvoir ouvrir la porte sans avoir…

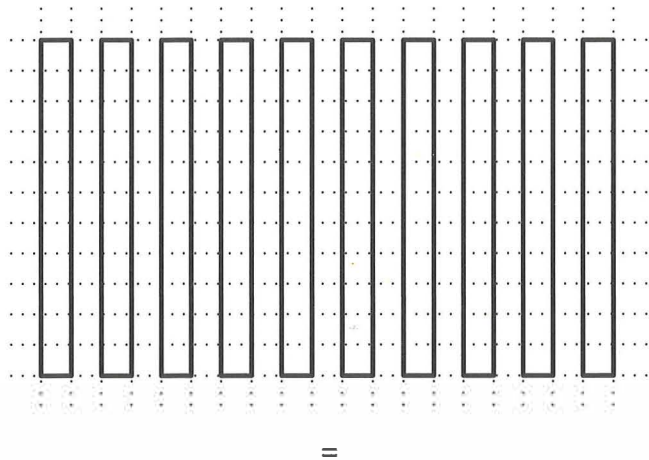C : Vous pensez que c'est possible ? Ils l'ont déjà fait pour d'autres logements ?

V : Je ne crois pas, je vais toujours demander. Au pire des cas je le ferai moi-même.

G : Au pire vous pourrez trouver un accord avec les autres. En disant tiens est ce que ça vous irait…
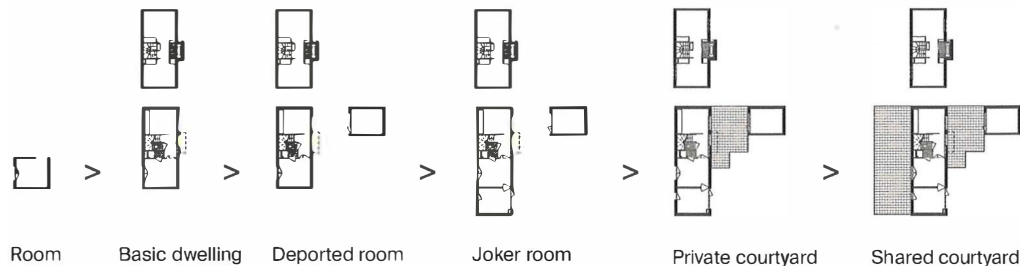
V : Ouais, à la rigueur ouais. Ben on se croise pas beaucoup.

Dwelling descriptive sheet, Zurich, Nantes, 2016
(source: authors)

La Sécherie, ground floor and design principles,
a collection of rooms
(source: authors)

| Room | Basic dwelling | Deported room | Joker room | Private courtyard | Shared courtyard |

From the single room to the dwelling
(source: authors)

Based on this concept, the basic dwelling combines four rooms, two on the ground floor and two on the first floor. An exterior 'deported room' is then added to this layout, on the other side of the exterior space. Some apartments also have a 'joker room', an additional room that can be assigned to one of its neighbouring dwelling units according to the needs of the inhabitants. Finally, the dwellings offer two kinds of exterior spaces. The first one is a private terrace that links the 'deported room' to the main dwelling; the second one is shared by either two or four neighbouring dwellings.

Kalkbreite: a complex block
The Kalkbreite cooperative project was built by Müller Sigrist in Zurich in 2014. It is set in the Aussersihl district, close to the city centre.
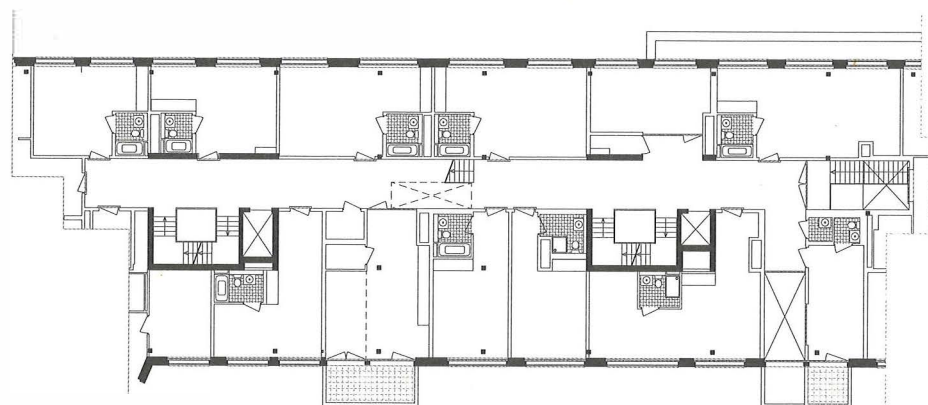
The project encompasses an entire urban block. It houses various functions, such as a tram depot on the ground floor with offices and commercial spaces on the perimeter. Above those spaces, housing is organized around a public central courtyard.

Regarding housing, the project conforms to a basic rule: all private spaces are reduced to a minimum in terms of surface and appliances (exterior spaces, kitchen furniture, etc.). Several typologies have been developed, from the 'cluster type', an aggregation of rooms along an interior street or around a shared living room, to more conventional apartments.
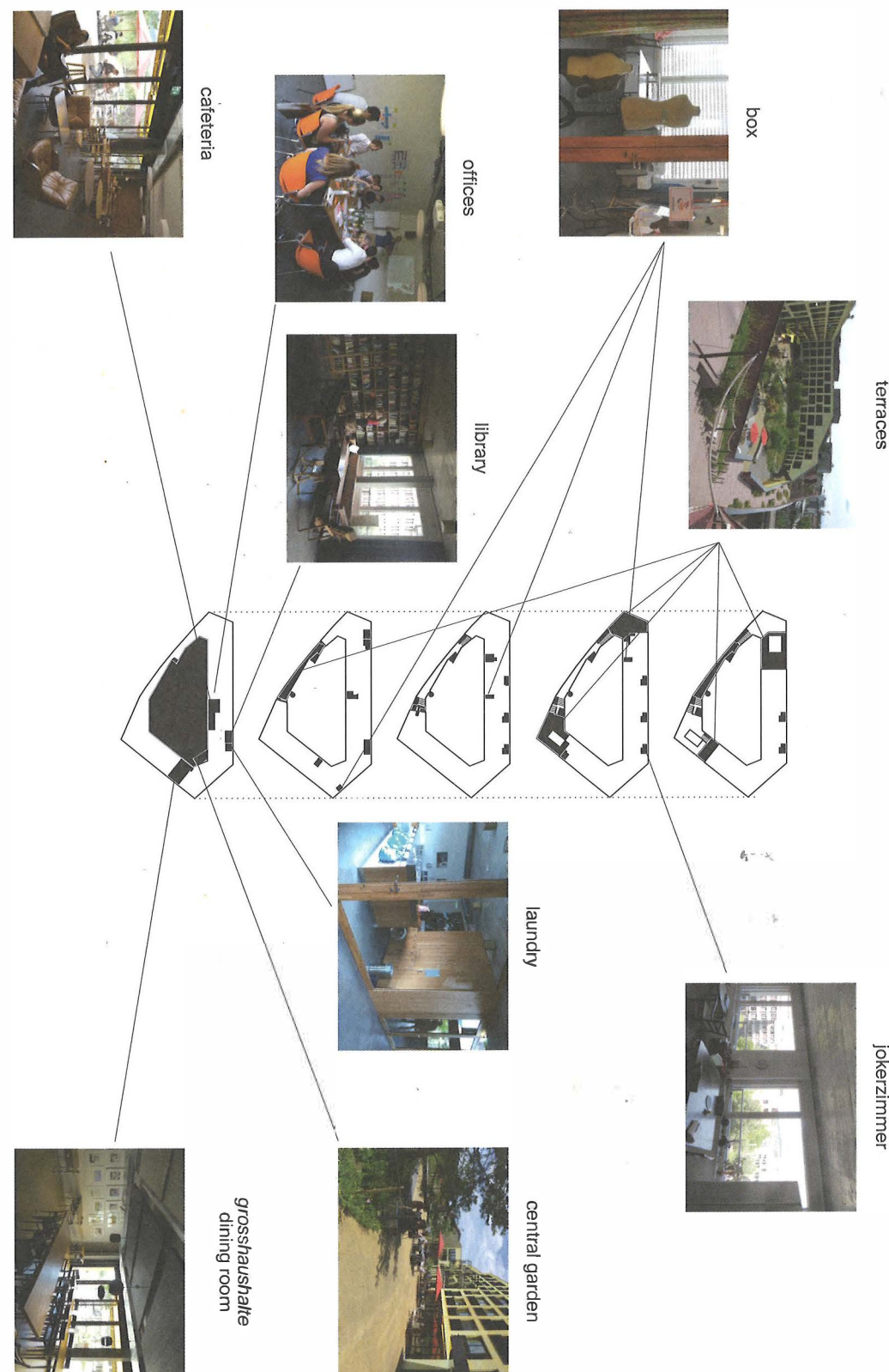
To compensate for these small living spaces, a series of services as well as collective spaces are positioned around the building, allowing 'for housing expansions'. On the one hand, collective spaces range from a large roof garden to a set of terraces, each with different qualities. Furthermore, the building displays several collective interior spaces: a cafeteria on the level of the roof garden, a collective dining room, a library, several laundries, shared working facilities, a summer kitchen, a sauna, communal living and dining rooms in the clusters, etc. In addition, a set of unallocated rooms – 'boxes' – are available throughout the building. Their use is determined
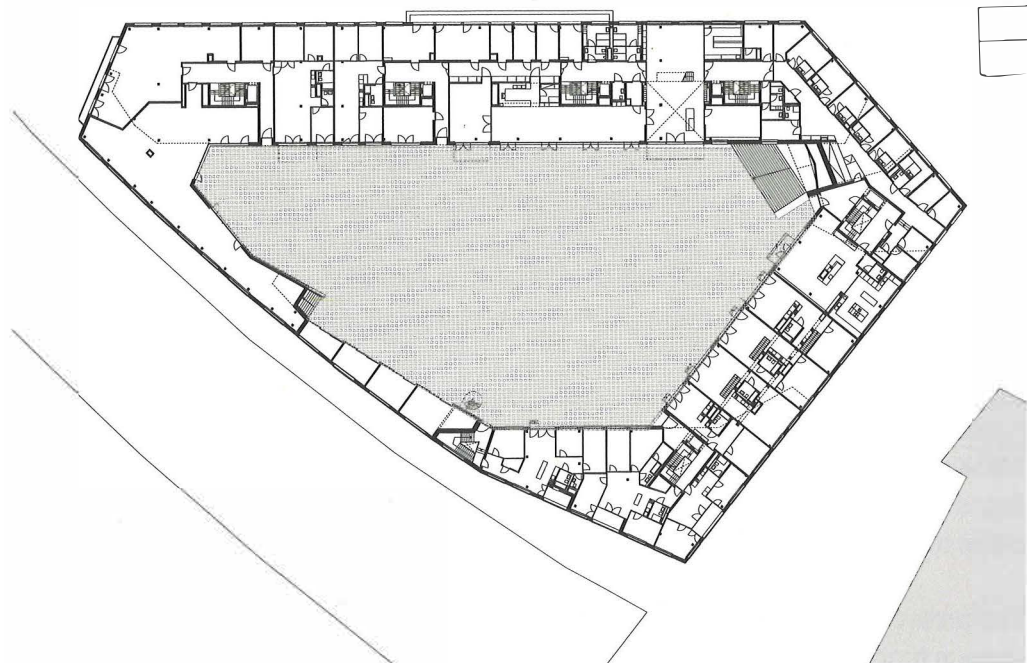
Kalkbreite, central garden level, Müller Sigrist, 2014
(source: authors)

0 ——— 250

One of Kalkbreite's large cluster apartments
(source: authors)

0 ——— 10

cafeteria

offices

box

library

terraces

laundry

grosshaushalte
dining room

central garden

jokerzimmer

Kalkbreite, collective spaces
(source: authors)

by the inhabitants.[18] Moreover, a collection of 'joker rooms' are scattered all over the building, as a set of studios of approximately 29 m² with a bathroom but no kitchen. They are assigned to housing units[19] for a limited period of time (ranging from six months to four years). On the other hand, various services are provided to the inhabitants, such as janitorial, housekeeping staff, the *Grosshaushalte*,[20] etc.

Reduction and extension

Two common principles – reduction and extension – are reflected in these projects. Indeed, both offer a reduced private nucleus – the lowest common housing denominator – around which dwelling extensions are organized.
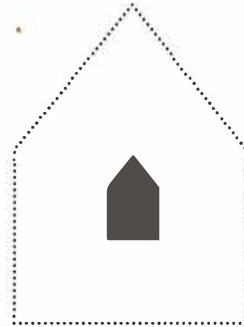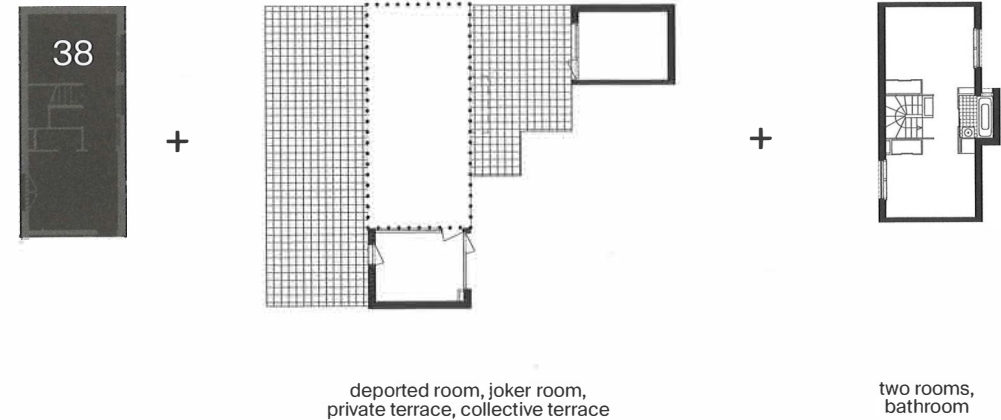

In Nantes, the reduction principle endeavours to reduce the functional specificity of residential spaces.[21] Given their spatial indetermination, all rooms are theoretically interchangeable. Hence, the basic dwelling would be a two-room apartment with a sanitary block of 38 m². Around this basis dwelling, a string of extensions ('deported room', 'joker room', exterior spaces) are arranged, each of them with a different status. Those extensions have a direct relationship to the basic dwelling.

18.
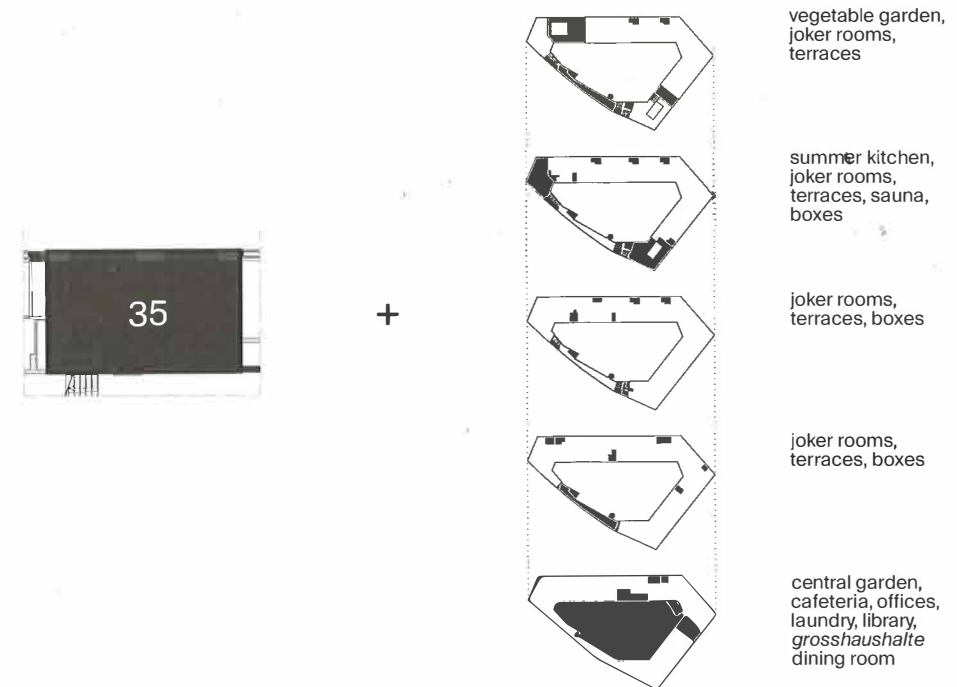The on-site observation identified various occupations: sewing, painting, yoga, etc

19.
Contrary to La Sécherie, 'joker rooms' are not necessarily contiguous to their attached dwelling.

20.
Literally meaning 'grand household', the concept was inspired by the Karthago co-housing project. Acting as a sub-community, it provides a kitchen and a range of amenities for 50 adults and 12 children for 140 CHF/month/person. In return, members offer collective services (cleaning, working in the fields, etc.).
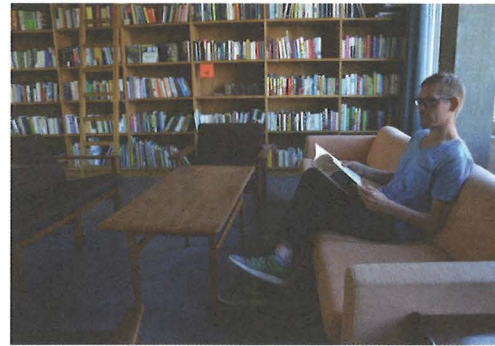
21.
According to Sophie Delhay, *'a dwelling should not be interpreted functionally'*. Interview with Sophie Delhay, Lille, July 2016.

38 + deported room, joker room, private terrace, collective terrace

two rooms, bathroom

Nantes, reduction/extension principle
(source: authors)

35 +

vegetable garden, joker rooms, terraces

summer kitchen, joker rooms, terraces, sauna, boxes

joker rooms, terraces, boxes

joker rooms, terraces, boxes

central garden, cafeteria, offices, laundry, library, *grosshaushalte* dining room

Zurich, reduction and extension principle
(source: authors)

Zurich and Nantes, inhabitants
(source: authors)
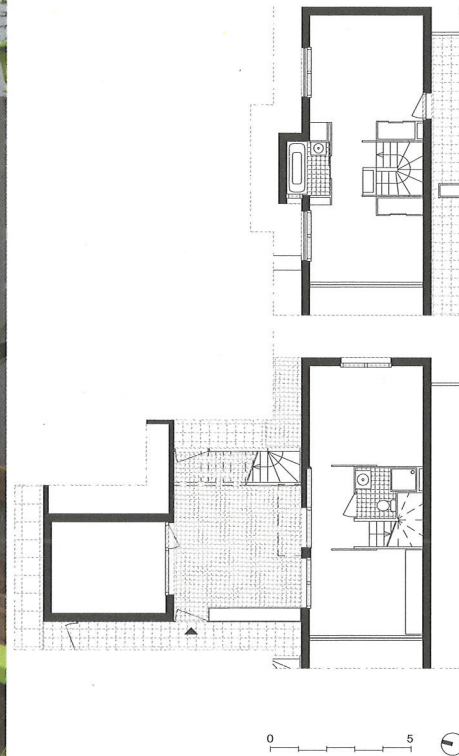
↑
Monique, a resident of La Sécherie

↓
Taking advantage, or not, of functional reduction
(source: authors)

In Zurich, the reduction and extension principle is an attempt to reduce private dwelling surfaces to a minimum. While the Swiss housing standard is 55 m² per person, in Kalkbreite it is 35 m². This reduction is compensated for by literally outsourcing several dwelling functions in shared spaces and services throughout the building. Hence, in both cases, dwelling spaces are organized between two poles. On the one hand, the private domestic nucleus serves as a conception lever. On the other hand, as a counterpart, a series of potential extensions of the dwelling are created. These potential spaces are made available to inhabitants according to their needs and uses.

Social analysis

Methodology, two stories

The potential of reduction and extension unveiled by the spatial analysis were tested by a series of field surveys carried out in both projects where researchers were housed for about one week.[22]

In order to better understand the dwellings' adequacy for their inhabitants' uses, the kaleidoscope of experiences is illustrated by two singular stories.

Story 1: Nantes, Monique

In Nantes, Monique, 49, is a single mother living with her two children of 16 and 24. She has been living in the estate ever since it was built. Monique rents a four-room apartment of 84 m². It displays two specific features, a 'deported room' on the other side of the private courtyard and a communal terrace on the first floor, shared by only one neighbour.

Reduction

In Monique's case, the social landlord explained the project concept from the start. The idea of polyvalence was an interesting added value to her. Monique fully understands the spatial potential of her dwelling. Indeed, having grasped the opportunity of afunctional rooms,

Dwelling past the limits of housing

Monique is planning to move her living room upstairs in the future in order to better accommodate it, as her children gradually move out of the house. Hence, in her case, the functional reduction of rooms is an opportunity to reconfigure her dwelling place.

Some inhabitants of similar apartments, however, have absolutely no clue on how to activate their potential; some rooms remain literally untouched and are used as storage in the best-case scenario.
To counterbalance the functional reduction of space, the apartment offers a range of extensions, which generate a series of dwelling behaviours: decompression, independence and negotiation.

Extension-decompression
One of the qualities of the extensions of the dwelling is that they can be used as decompression spaces. In Monique's case, the private courtyard has this quality. It is a peaceful place, furnished almost as a room. She represents it literally as the core of her dwelling.
For others, this is the case for the 'deported room', as it is the case for a divorced father who confessed to the architect that *'when my daughter comes home, we go out together'[23]*; he has turned it into an additional living room. Hence, in both cases, inhabitants consider the extension a potential decompression space that can serve more unusual functions.

Extension-independence
Moreover, the extensions of the dwelling allow for independence in the household. This is the case for Monique's 'deported room', on the other side of the courtyard. It has become her son's retreat. *'He is able to sleep in and does not hear me when I vacuum ... He can go to sleep whenever he wants'.*
In other cases, the 'deported room' served a more specific function, varying from an Arab salon to a *boudoir* to a room for a new partner of a father who sleeps in the main house with his three children in order to create a gendered separation.

23.
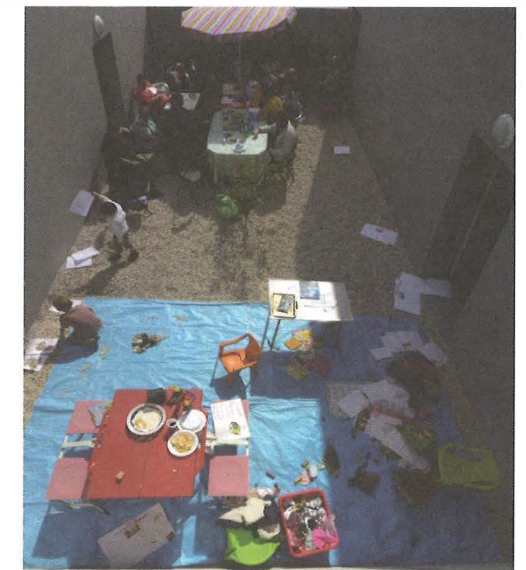Interview with Sophie Delhay, Lille, July 2016.
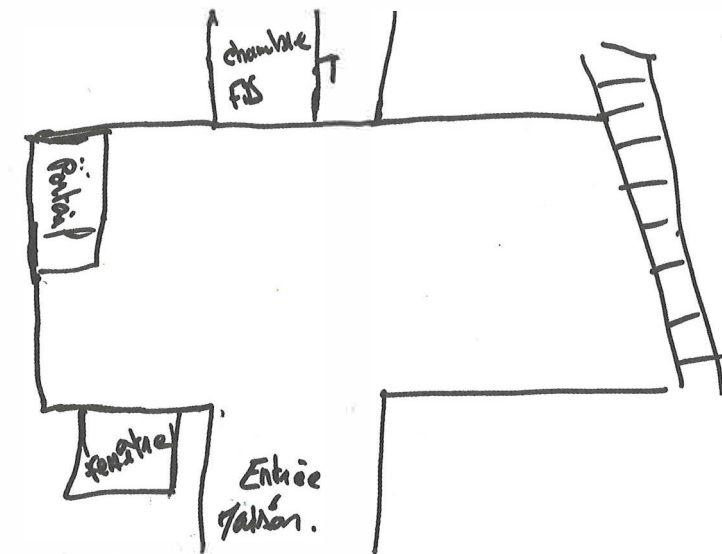
My dwelling, drawing by Monique
(source: authors)

↑
The *'deported room'*: a bedroom, a *boudoir,* an Arabic salon,
(source: authors)

↓
Negotiating shared spaces. Monique – Hugo
(source: authors)

Extension-negotiation

In order to fully use all the apartments' extensions, inhabitants need to negotiate their use with others (inside or outside their household). For Monique, this is the case of the first floor terrace that she shares with her neighbour from the opposite apartment. Monique barely uses the terrace, because her neighbour has monopolized it. Tired of having to negotiate this space, she wants to split the terrace into two private ones.

While other inhabitants experience the same kind of conflicts, forcing them to shut down their access to the extensions, others have managed to find agreement with other tenants to manage their shared terraces. When this is the case, inhabitants use two different exterior spaces (e.g. one for the children to play in and one for the adults).

Story 2: Zurich, Martin

The reduction and extension principle in Kalkbreite is exemplified by the dwelling patterns of Martin, a 62-year-old married man with three daughters. As their daughters grew up, the couple decided to move from their 250-m² house in the countryside back to Zurich. After living in several apartments in town, they now live in a 62-m² apartment in Kalkbreite.
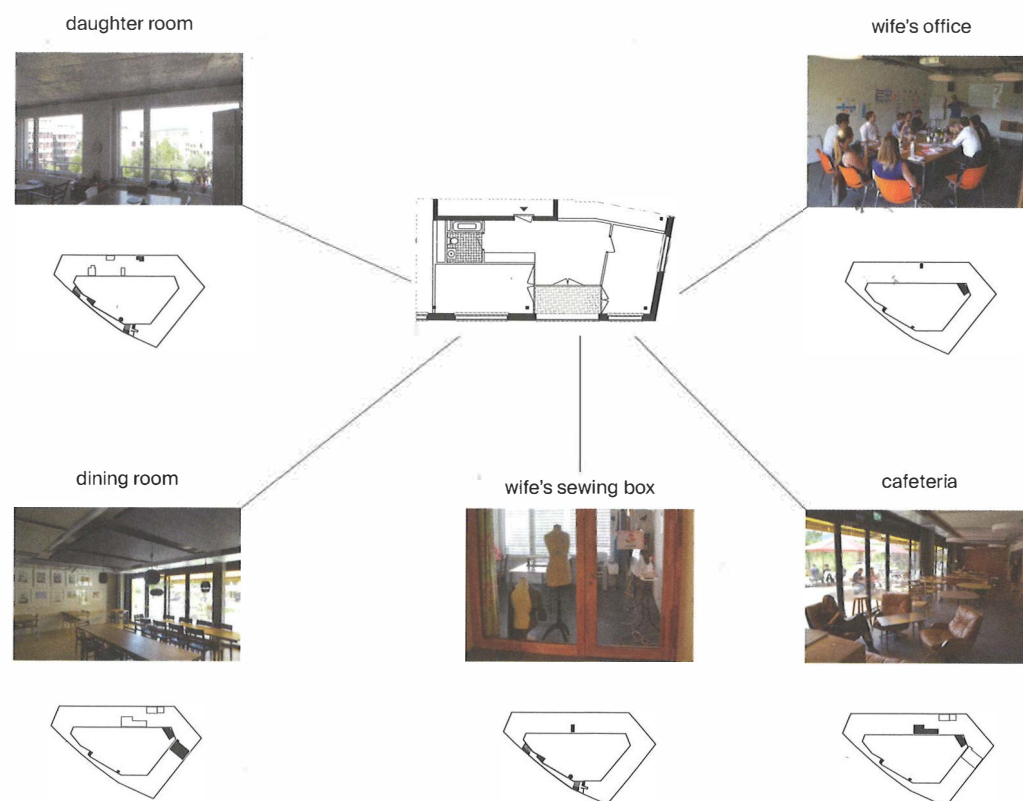
While this move to a smaller dwelling was a conscious choice for Martin, others in the building do not see it as a choice but rather something they were driven to do (e.g. as ageing or disabled people, less wealthy individuals, separated couples, sometimes are).

Reduction

Moving from his comfortable house with a garden to a small apartment has had consequences for Martin's living habits. First, as with many inhabitants in Kalkbreite, Martin had to leave behind most of his furniture and use fewer appliances.[24] Second, he and his wife are now forced to live in *a much more confined* environment. Finally, the couple is no longer able to house their three daughters in their private apartment.

24.
Even though many inhabitants confess that they 'cheat' in adding some appliances to their apartment.

Martin, a resident of Kalkbreite
(source: authors)

daughter room   wife's office

dining room   wife's sewing box   cafeteria

Martin's uses of the extensions of his apartment
(source: authors)

In addition, most apartments have no exterior space that encourages inhabitants *'to enhance the use of the collective exterior spaces'*. For many, the central question is *'how to forget the* [traditional] *housing'*.

Extension-decompression

In view of these significant changes, Martin has adapted his living habits as well as the very limits of his home. His actual dwelling is spread throughout the building. As he puts it himself, *'in Kalkbreite, your living space is automatically larger than your private apartment'*. For instance, Martin reads his newspaper in the cafeteria and has supper in the *Grosshaushalte* dining room, while his wife works in an office on the other side of the central courtyard or uses the textile worshop 'box' – *'her refuge'* – for her sewing activities. Both succeed in decompressing by using these apartment extensions. In addition, Martin admits that his vacation house has also eased the relative compactness of their apartment.

Other inhabitants illustrate the use of these extensions when they draw a picture of their dwelling. In two particular cases, the dwelling's extensions allow couples to literally *'live apart together'*[25] *(e.g. Hugo's story, see opposite page)*. Hence, they live in the same building but in separate individual flats.

Extension-independence

Only one of Martin's daughters still lives with him and his wife. However, she does not live in his apartment because of its size. Instead, she uses a 'joker room' in another part of the building, which grants her relative independence, *'and she does indeed what she wants ... it's chaos over there ... it's her thing'*. It is seen as an ideal transition before leaving the household for good.

This 'joker room' principle is very popular in the building. A resident whose husband suffers from Alzheimer's also uses it. A friend of theirs moved into the 'joker room' in order to help with daily care. Nevertheless, this exterior room principle is not the only feature that gives inhabitants

25.
de Singly, F. (2009) *Libres ensemble. L'individualisme dans la vie commune*, Saint-Amand-Montrond: Nathan.

My dwelling, drawing by Hugo. From left to right, *'Flat of my wife, staircase, common space, my flat, hall'*. (source: authors)

more independence, as most single households stress the fact that the building offers greater independence than in a traditional apartment.

Extension-negotiation
Splitting up the dwelling's functions throughout the building has a major impact on its social organisation. It compels people to negotiate their use of space and creates sub-communities. For instance, Martin has become very involved in the *Grosshaushalte*.

Sometimes, this negotiation is demanding, leaving some of the collective spaces vacant or simply less frequented because their *'access is awkward'* (e.g. the upper terrace, only accessible through a cluster apartment). For instance, the living rooms of the 'street clusters' are very often empty. Moreover, services are also pretexts for negotiation: inhabitants organize various services for others (summer parties, etc.) while *'collective work no longer exists since it was impossible to control'*.

Living beyond the limits of housing

Our societies tend to evolve towards increasingly individual living trajectories. Reducing personal housing space is a dwelling principle that seems to accommodate this trend. It can operate by reducing domestic space or functional specificity.

Yet the explorations of the La Sécherie and Kalkbreite projects demonstrate that the dwelling 'reduction' principle is not sufficient in itself and creates various difficulties. To compensate for these restrictions, both housing projects offer a series of dwelling extensions that are either remote or in direct relation to the reduced housing. This combination of 'reduction and extension' allows inhabitants to dwell beyond the limits of the reduced nucleus.

Thanks to this combination, decompression and independence are guaranteed for inhabitants. Decompression refers to how dwellers welcome others into their home. Any dwelling should ensure the modulation of this hospitality. Independence represents the dwelling

↑
Martin's daughter's *'joker room'*
(source: authors)

↓
Street-cluster, living room
(source: authors)
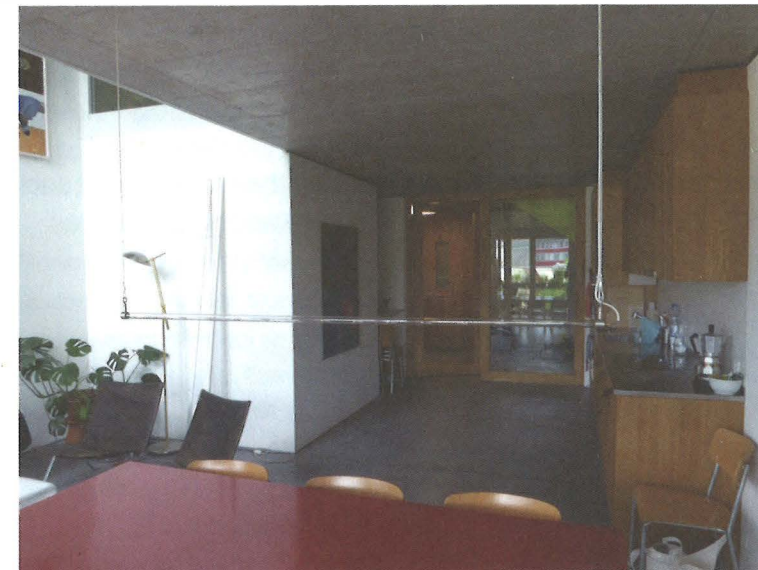
as a place that spares[26] the inhabitant from presence of others. The dwelling needs to enable the dweller to define the right distances from others.[27]

Being able to host or spare oneself from others are two major characteristics of dwelling. They are achieved here through the extensions of housing.
Yet in order to activate such potential, several skills are required of inhabitants. First, they need to be aware of the dwelling's capacities and possible extensions. This awareness is generally acquired through education or more specifically through communication about the housing project itself. Second, using these extensions depends on the competences (social, economic, etc.) of inhabitants. Third, activating the dwelling's potentials is determined by the number of inhabitants when communal spaces are disputed either explicitly or implicitly.[28]

From a sustainable perspective, once activated, the 'reduction and extension' principle offers two major options.

First, it allows for dwelling evolution, both on individual (personal trajectories on a daily or life basis) and multi-personal levels. The reduction of the housing unit to its core combined with potential extensions provides dwellers with additional possible configurations and a variety of long-term projections. The dwelling configurations can change without a tenant having to move to another abode. Reconfigurations are possible: the spatial patterns are not static and can promote change. The possible reconfigurations give the dwelling a sense of polyvalence.

Second, the principle offers means for the dwellers to decide. It enables them to broaden their life choices and individual freedom. In this sense, the dwelling is a source of empowerment.

26.
'The fundamental character of dwelling is this sparing and preserving', Heidegger, M. (1971) Poetry, Language, Thought, Toronto: Harper & Row.

27.
Besse, Jean-Marc (2013). Habiter un monde à mon image, Paris: Flammarion, pp. 42-43.

28.
However, this assessment needs to be qualified in relation to the fact that all apartments are rented in both case studies, creating less friction.

In conclusion, the individual dwelling can be used as a new paradigm for housing production if it does not imply solely reducing dwelling limits. By applying the 'reduction and extension' principle, the dwelling can properly support the relationship between the individual and others. These changes represent a substantial paradigm shift, as many dwellers testified, in Nantes and Zurich, that they live beyond the limits of housing, that they 'use the home, not the flat'.

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