

# FROM PROTOTYPING TO ALLOTYPING

## The invention of change of use and the crisis of building types

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*The chapter analyses the invention and the form of the discourse on building conversion as one particular instance of redefining what a technology is and how it operates. I describe a shift from expert defined closure to lay based openness and tinkering as a shift from prototyping to allotyping: Since the early 1970s, change of use and building conversion have become a central and fashionable discourse among architects and architectural theorists. Before the 1970s, buildings were understood as technologies, as 'society made durable'. The notion of building type was central to link a building to a given use. A bank was a bank because architects applied existing templates, prototypes, to turn a building into a bank. In the 1970s, suddenly buildings became flexible – discursively, since building conversion always existed: 'Building type' no longer was a meaningful link between a building and its use. A bank should not stay a bank, but become a hotel, a theatre or a flat, in short: an allotype. The chapter elucidate this central shift in thinking about buildings and reflects on the special case of allotyping buildings and how it continues to vex thinking about buildings.*

**KEYWORDS:** architecture; buildings; change of use; prototypes; building type; post-modernity; users; sociology of architecture; actor-network theory

### Introduction

Recent discussions of prototyping have relied on a specific notion of prototyping: Prototyping is seen as a practice, which operates in a test mode, which allows collaboration, and which allows bricolage (Corsín Jimenez & Estalella 2010). As often, when new notions find their way into the repertoire of the social sciences, they are somehow both presented as a novel feature, and positively connotated. Prototyping is portrayed in positive terms. In opposition to attempts by experts to make society durable with objects (Latour 1991), it is provisional and inclusive.

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Architecture is a field in which prototyping, in the sense of testing and collaborating, has a long history. Within this field, it has traditionally not been called prototyping, and prototyping only recently acquired this meaning within architecture (Runberger 2008). Architecture allows us to see the preconditions of prototyping and because of this long history, it also allows us to see the contradictions of prototyping as currently understood.

Architectural theorists and historians have been interested in the unstabilised, destabilised and ephemeral, have written histories of bricolage (Scalbert 2011) and user participation (Blundell Jones 2005). The goal of this article is to highlight how these ideas about the user and the ephemeral have contributed to the conceptual underpinnings of

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‘prototyping’. These conceptual notions hint at a particular relationship between architects, buildings, users and society – or more generally speaking: between experts, objects of knowledge and design, and users. They imagine that both experts and users are socialised actors that have a say in the design of objects and that the objects are unstable and kept unstable for a good reason. But why should designers and users collaborate, and why should objects remain unstable? In this article, I analyse both the rise and crisis of the notion of type and I use the sudden appearance of change of use, or *allotyping*, to show the confusion that emerged surrounding the relationship of architects, buildings and users and the question of which of these three entities stabilises which other entity. As I will show, the confusion was such that the sudden crisis of types shifted power around from architects to users and society; to buildings and finally back to architects.

It is important to add an etymological note here about the meaning of ‘prototyping’. The notion of ‘prototyping’ as it is used in the context of this special issue and in this article, appeared in architecture around 1970 and created a great deal of confusion. Indeed, in architecture, prototype originally referred either to ‘first’ or to ‘original types’. As a notion for the ‘original type’, namely the primitive hut, it is in use at least since the eighteenth century (Hodges 1787; Rykwert 1972). It remains in use, for example when Kenzo Tange, the father of modern Japanese architecture, calls the shrine of Ise ‘the prototype of Japanese architecture’ (Tange 1965). The latter notion of ‘first type’ is equally established but is much more recent and relates to the notion of originality, both as a proof of artistic prowess and as impossibility. Prototypes in this sense are invoked to designate daring designs (Vollaard 2007).

Both of these established notions speak to the etymology of the term, but they do not match the test mode, user participation or bricolage. Often, the case is quite the opposite, they stay firmly within an architectural discourse that imagines buildings either as grown from, and stabilised through, tradition (the primitive hut), or designed and pre-stabilised by an author-architect before erected to become *society made durable*. In this text, I do not follow this history of the term prototype within architectural discourse. Rather I follow what is meant by prototyping in current design discourse, namely a particular relationship between designers, objects and users.

I start with some notes on the peculiar *kind of tale that I tell*. I will then focus on a *sequence of displacements*, whereby in each displacement the relationship between architects, buildings, users and society gets reshuffled. I begin by explaining how architects attempted to make society durable with the help of buildings and the crucial notion of type. I then jump to the 1960s to trace the confusion that set in when this idea came apart. The first displacement traces the invention and glorification of the user and the demise of the power of the architect over buildings. In the second displacement, the empowered user invents change of use and destroys buildings as stabilising types. The third displacement establishes change of use as a result of empowered users, and as a proof of pluralised and individualistic societies. The fourth displacement shifts power to buildings, and establishes conversions as better buildings than those buildings where type and use conform. In the fifth displacement, architects are inspired by change of use and this changes their notion of *buildings*. In the sixth displacement, architects regain power by learning from change of use not to attempt to stabilise uses but, rather, stabilise forms. Finally, in the seventh displacement, the re-stabilisation of buildings, where use does not matter, is taken as a sign of pluralist and individualist societies. The sequence of displacements that cycle around *allotyping* amounts to a critical history of prototyping

avant la lettre. It shows how difficult an understanding of unstable practices becomes *if it is accepted that society cannot be stabilised by buildings*, and once prototyping has become the accepted viewpoint from which to view the relationship between designers, objects and users.

### The Circulation of Causality around Allotypes

The following story is presented as a sequence of displacements or conceptual shifts. These displacements focus on epistemological reconfigurations, the circulation of causality and shifting power distributions among architects, users and buildings. Like Lorraine Daston's and Peter Galison's account of shifting ideas of objectivity, it has no precise location, nor is it confined to a group of actors who act together, nor is it a social history where demographic or economic shifts lead to change (Daston & Galison 2007). I am not aiming at powerful forces behind actors, nor do I imply that everyone within the field of architecture was affected by it (in fact, a large part of architectural production was and remains completely unaffected by what I describe). *It is also not a story of the actual power of architects, users and buildings. It is fundamental for this account that the actual distribution of power and the actual causalities cannot be easily pinned down and are messy and complex.*

It is a story of how a concept, *change of use*, started to perplex a number of authors who tried to make sense of the relationship between architects, buildings, users and society and thus became a focal point for what now is discussed under the headline of prototyping in other fields.

In these shifts, the seemingly simple fact of what a building is and does, and the moral judgements about who is in control, changes. These shifts that I describe happen more or less in parallel all over the western world. They involve various professionals who deal with buildings: planners; architects; architectural theorists and users. The story I describe is not chronological; it is primarily conceptual, as I try to describe different problems that emerged from the crisis of buildings-as-technology. Each section of my article describes a different result and solution to this problematic.

The story is about the relationship and normative qualification of four entities: first, the architect, planner or designer; second the building; third the user and the fourth is society. These four entities undergo very little change in the actual world. Buildings have existed for thousands of years and at least some of them have been designed by architects. The methods of architects have undergone very little change, and the change that took place is largely irrelevant for my story.<sup>1</sup> The same is true for the buildings themselves, although they have changed in form and material, this is largely irrelevant for the story to be told here. A history of building technology may show changes in building materials, but these relate very little to changes in control over users. To give one example, the invention of reinforced concrete changed numerous building parameters to an enormous degree (Slaton 2001), but it did not change the relationship between architects and users. Or, to reverse the argument, the functional and rationalist ideas of modern architects did not depend on technological advances. For example, the Frankfurt kitchen, one of the classical examples of modernist design that followed from rigorous user analysis (Kramer 1986), would have been technologically possible 200 years earlier. Conversely, and even more obviously, the sudden appearance of the seeming power of users in the 1970s was not a result of technological change. To understand the story, I tell below requires first and

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foremost accepting the disconnect between a history of technology of buildings and how the relationship between buildings, architects and users is conceived. It is this very disconnect that prompted the unfolding of the displacements I describe below.

From a comparative perspective, it is important to understand that this disconnect is peculiar to buildings because buildings are, as I have argued elsewhere, not proper technologies, but quasi-technologies, whose causal properties remain unclear (Guggenheim 2009). For other objects that are proper technologies, technological change matters very much for how these objects relate to users and who is in control (consider various weapons or the history of personal computers).

The lack of actual changes of power in the relationship between architects and users is precisely why I write a tale of conceptual displacements rather than a history of actual building technologies. What changed radically though, was how architects *thought* about buildings and users. In fact, a central irony of the story relates to the fact that architects *thought* they could build new buildings, and with new buildings produce new users, and then found out that they could not. The story I tell is a shift of *assumed* power among these three entities and the moral judgement of these assumed powers from the viewpoint of architects, planners and sociologists. The terms proto- and *allotyping* then describe a certain relationship between architect, building, user and form.

### *Setting the Scene: Making Society Durable with Buildings*

A crucial idea of modern architecture consisted in establishing a straight line of power from the architect through the building towards the user. This idea developed on from the early nineteenth century and reached a high point in the first half of the twentieth century. There are far too many side-stories, ironies and complexities to do it justice here, but the story is also well known, so I can limit myself here to some basics before moving to the more interesting part that deals with the predicaments that results from it.<sup>2</sup> The story as detailed here is a caricature, but the caricature also explains the later displacements, which were based on the same caricaturist understanding of modernity. Rewriting the history of modernism in a less caricaturist way, was a later outcome of these displacements itself (Heynen 1999; Henket & Heynen 2002), which does not undo the very caricaturist reasons that initiated the displacements. The goal here is to understand the invention and results of *allotyping*, not to give a historically adequate view of the modernist view of buildings.

Let me start with the origins of the notion of type, which, ironically, has its roots in a wave of *allotyping* after the French revolution. Suddenly architects were faced with the fact that they needed to build a large number of new building types such as courts, parliaments, hospitals, prisons, theatres and museums (Markus 1993). Such a building programme was impossible to complete in a very short time span. Architects resorted to changing existing buildings (O'Connell 1995), and to do so they developed manuals which described certain building types as a specific material arrangement to achieve specific, and at the time, new 'functions' (the term rose to prominence only after the Second World War). Out of this building programme grew a more general urge to describe and formalise building 'types'. Thus architectural theorists such as Quatremère de Quincy attempted to define 'types' (Quincy 1788), and the first design guides, such as JNL Durand's 'Précis des leçons d'architecture', appeared (Durand 1821).

For our purpose, the central feature among the many different things a 'type' could be, is that it describes a set of loose formal descriptors that established a building as an

180 element of a class of buildings designed to do something for the user.<sup>3</sup> By following a design guide and designing a certain building type, an architect would guarantee that a building would visibly and functionally allow users to perform a specific set of tasks. A building type 'court' would be defined by a certain sequence of spaces such as a courtroom, hallways, a certain layout of these spaces and an interior design including furniture to allow for trials. It would be the material facilitator for the specific sequence of actions that the social organisation 'court' would produce. This also allowed the rewriting  
185 of architectural history as diversification and elaboration of types, which were understood as buildings undergoing formal transformations related to specific uses (Pevsner 1976).

190 Since the early twentieth century design guides appeared, most famously 'die Bauentwurfslehre' by Ernst Neufert (1936), considered to be the best selling architecture book ever.<sup>4</sup> These guides went to great lengths to define as closely as possible the relationship between building types, their parts and their uses. The role of the architect consisted in designing a building that would be derived, as closely as possible, from such forms. Rather than treating buildings as wholes, as Durand did at times, Neufert radically dissolves them into constituent parts and derives these parts from measuring humans. A bench is derived from measuring an average seated human, and a church is then built around the required number of benches with aisles, whose width is again derived from measurements, and so on.

195 Architects and planners also sought to establish finite lists of functions that buildings or cities had to provide for (Meyer 1928; Le Corbusier 1943). The idea of tailoring a building based on measuring users received a final boost after the Second World War, when architects tried to use 'design methods' based on the new system sciences to turn architecture into a science (Fezer 2011; Gregory 1966). Following the same ideas as Neufert, in theory a building would now be computed from data about future uses. Initially, it seemed that the notion of 'type' would become superfluous, since no overarching idea or form would be needed to calculate a building. Rather each building would uniquely be derived from the addition of individual uses.

200 Types implied a classical notion of prototyping. As I discussed above, traditionally architects used prototypes to denote a first type. Somewhat ironically, this notion is opposed to the prototype as test version and collaboration, but it is also a precondition of this notion: buildings were designed to make society durable, based on the underlying assumption that the architect would have the knowledge to do so. Types were prototypes  
205 in the architect's studio, from where they were released into the real world. While indeed some buildings were built according to these ideas, many buildings did not fit these ideas and many were not used according to the architects' plans. But it is essential to understand that architects in this period ignored this differing reality. They strongly believed in what was later called technological determinism (Smith & Marx 1994; Vanderburgh & Ellis 2001).

210 This can be seen most clearly by the complete absence of creative users and of change of use as a topic of architectural discourse between 1800 and 1950. Although an imprecise measure, in my own database on texts concerning change of use, 39 items appeared in the seven decades before 1969, but 103 appeared in the decade between  
220 1970 and 1979, a number that stays more or less constant for the following decades. Google N-Grams, which measures relative numbers of words in books compared to all existing books returns a similar picture.

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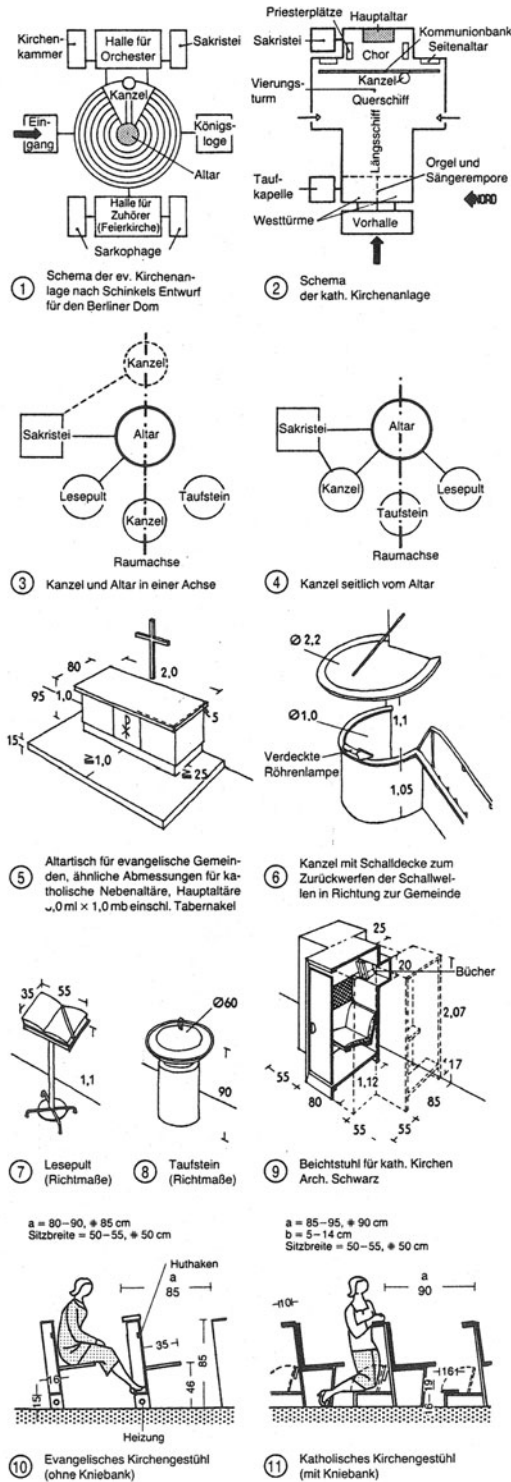
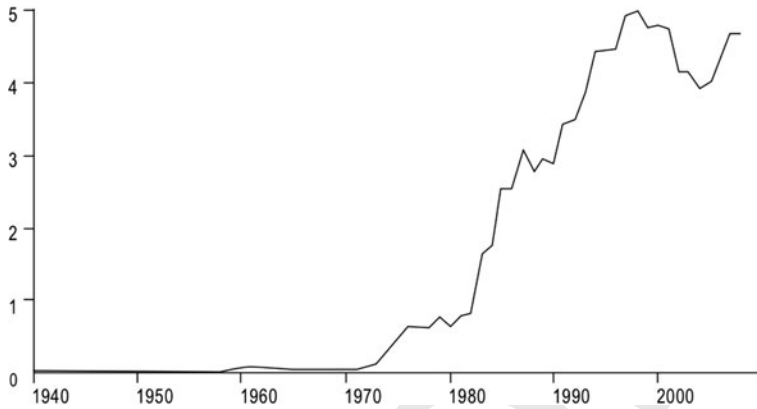


FIGURE 1  
'Churches' from Neufert 1992, 33rd edition, p. 568.





**FIGURE 2**

Google N-Grams of the relative number of books containing the term 'Umnutzung', 1940–2005.

If architectural discourse touched on change of use before ca. 1970, it hit a sceptical note, as for example in this quote from the German historian of architecture Paul Frankl from 1914:

If we study buildings of older cultures and find one lacking in original fittings because, for example, what was once a monastery is now a courthouse, then our need to *know* something becomes still more conspicuous. The spectator who is without knowledge has even greater need for the right reference when confronted by a building designed for an obsolete purpose. He sees a great display of artistic forms but does not perceive why they exist. For him, they are mere ornament. As his historical knowledge grows, he can begin vaguely to reconstruct the essence of the building.... (Frankl 1968, p. 158)

Frankl demonstrates that from the viewpoint of buildings as society made durable, change of use is a problem: for the architectural historian, the stream of power from the architect



**FIGURE 3**

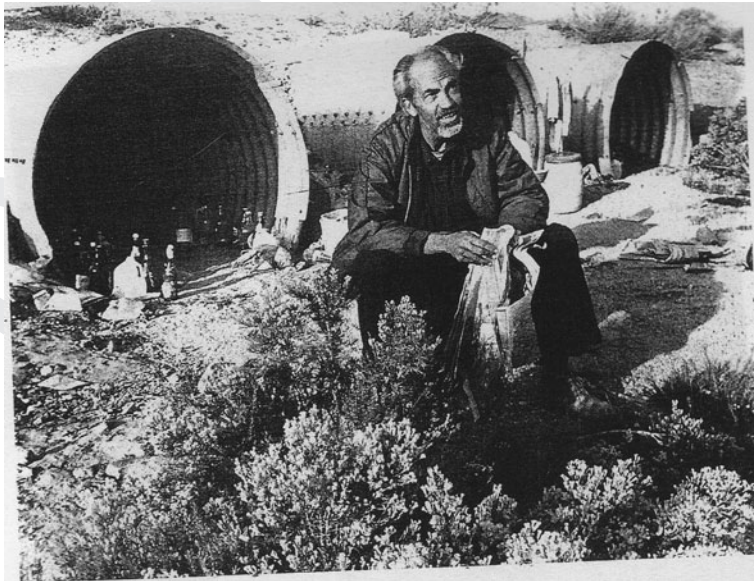
The circulation of power from the architect through the building to the user and society.



**FIGURE 4**  
The empowerment of the user.

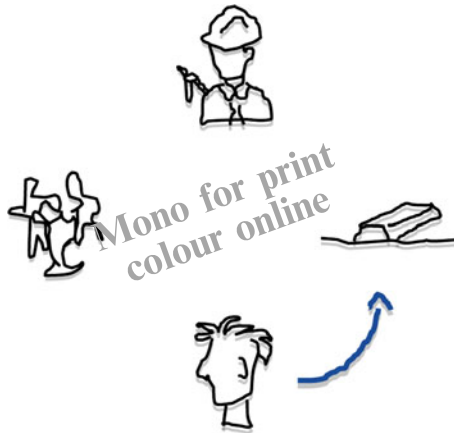
through the building to the user allowed for an understanding of the building simply by reversing the reading direction: looking at the use would allow one to understand what the architect intended. Change of use disrupts this stream and makes such a reverse reading, and therefore architectural history, difficult and only possible by reverting to additional data such as historical plans or descriptions, which lie outside of the building and the grasp of the onlooker.

Another reason for the absence of change of use in architectural discourse is that even if change of use was an ubiquitous phenomenon, for architects who aspire to a



**FIGURE 5**  
Nippon Troll from Jacopetti et al. (1977, p. 8).





**FIGURE 6**  
Allotyping as empowering the user.

reputation as artists, change of use was, if at all, a necessity, but not an artistically valuable undertaking. When Barbaralee Diamonstein published one of the early books on change of use, she cited the architect Hugh Hardy as follows: 'It's only recently that you could reuse a building without losing your standing in the profession'. She also quotes Harry Weese, who explains that architects oppose change of use because it is a 'threat to the system' that 'may keep architects from building new structures, developers from doing the same, and governments from satisfying their edifice complexes' (Diamonstein 1978, p. 28).

### The First Displacement: Discovering the User

The classical notion of (proto-) type was firmly in place until ca. 1960. Beginning in the 1960s, architectural discourse suddenly underwent a number of displacements and



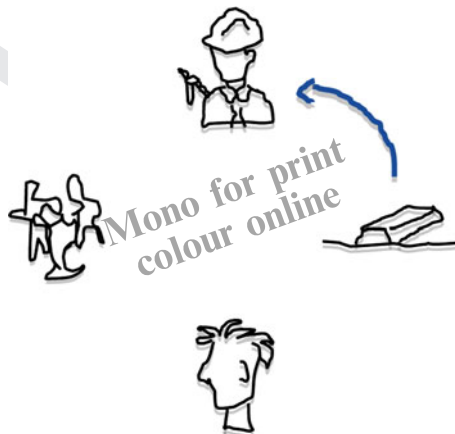
**FIGURE 7**  
Allotyping as a sign for liberal society.



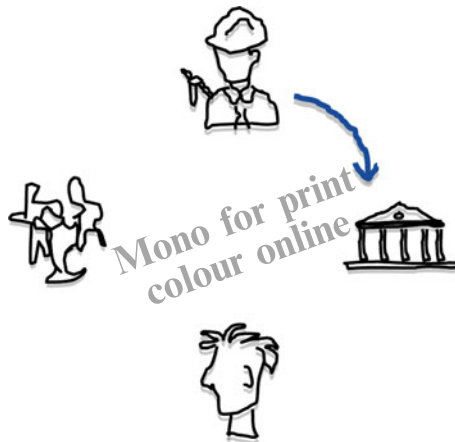
**FIGURE 8**  
Allotyping surprises the user.

change of use, or *allotyping*, became the test case for these displacements. The first of these displacements was the discovery of the user as a powerful and creative actor.

While in modernism the user was a number, a passive object to be measured, or at best taught by well-meaning architects and reformers how to live, the user emerged in the 1960s as a subject and as a powerful and at times subversive actor. The 'revolt of the audience' as Jürgen Gerhards calls it (Gerhards 2001; Guggenheim 2010), occurred not only in architecture, but in many other fields as well: in medicine, patients started to self-diagnose and challenge doctors; in the arts, everybody became an artist; in politics, the demonstrator in the street became the subject of politics. These shifts designate not the invention of these practices, since people always self-diagnosed, lay people have always made drawings and people have always gathered in public to claim their rights. But suddenly literate people began publicly questioning the power of experts and the experts themselves lost confidence about their expertise, while the very objects of expertise lost



**FIGURE 9**  
Allotyping surprises the architect.



**FIGURE 10**  
The architect takes command again and Allotyping.

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their shape. If everybody was now an artist, how does one identify a painter and a good painting? If doctors and hospitals were making people sick or crazy, rather than making them healthy, what was normality or illness? Sociologists and social psychologists began explaining art, criminality, insanity or illness, not as resulting from individual features, but as results of labelling or social constructions.

In architecture, the emergence of the user was as much a result of speaking about actual users as of the recognition by architects that their promises to know what the user wants have failed. The user in that sense emerged simply because buildings seemed to fail (Boudon 1969; Sommer 1974). Suddenly professional architects seemed to be incapable of doing society with buildings. Critics like Jane Jacobs or Alexander Mitscherlich, who both were not architects, made architects and city planners responsible for everything that went wrong in modern cities (Goodman 1972; Jacobs 1962; Mitscherlich 1965). The layperson, in contrast, seemed to know how to live in and how to do buildings. For



**FIGURE 11**  
Post-modernism derived from allotyping is a sign of a fragmented society.

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example Barbaralee Diamonstein, in her book 'Buildings Reborn', cited the architect James Marston Fitch, saying that 'society is ahead of the profession. All the spectacular instances of individual buildings or whole towns being conserved are done by laymen' (Diamonstein 1978, p. 28).

In modernity, the user as a measured object was often a single unity, either a worker or a housewife. The newly discovered user as an actor became identified with what previous definitions omitted. Peter Jokusch defines the user in a book on 'architecture for the user – use-architecture' as follows:

Users ... are the weak: marginal groups and those groups that are most often the subjects of research in environmental psychology – children, old people, the disabled and foreigners. The interest [of the architect who wants to design for 'users'] for business people, industrialists, managers, private real estate investors and members of the ministerial bureaucracy is afflicted with prejudice if they do not happen to have a heart for the creation of social infrastructure. (Jokusch 1984, p. 22)

The user was not so much an empirical figure – managers certainly are users as well – but one defined by her potentially resistant capacities that needed support by sociologists and critical architects.

The crisis of architects and the celebration of the user was also an effect of realising that in non-western societies, and on the fringes of western societies where people themselves built their houses, such buildings seemed to manage better to conform to the user's wishes. A book title of one of the foremost researchers of vernacular architecture claims like a modernist manifesto: 'Built to meet needs' (Oliver 2006). Vernacular buildings, or 'architecture without architects', as Bernard Rudofsky aptly called it (Rudofsky 1969), emerged as an architecture that was *better* suited to making society durable.

The invention of the user saw the way buildings were stabilised reversed: Instead from the architect through the building to the user, power now flowed from the user to the building, with the role of the architect put in doubt as either detrimental or unimportant.

### Second Displacement: *Allotyping* as a Result of the Empowered User

If the user was a creative being who could interact with buildings, then surely there should be cases where such user-action could be empirically observed in buildings themselves? What could be a proof of the creativity of the user? The perfect proof for the creativity of the user is when users turn a building type into another use that does not conform to its intended use, and the building works according to this new use. This would turn the basic ideas of Neufert and other proponents of buildings-as-technologies on its head:

He is known as the Nippon Troll. He lives scot free in three rooms, each with running water when it rains. One is a storeroom for food, water and firewood; another is a bedroom with America's deepest wardrobe; and the third is a library/reading room stocked with magazines, newspapers and books. (...) His backyard stretches long miles through the desert between Los Angeles and Las Vegas. (Jacopetti et al. 1977, p. 8)

What sounds like a description from a fancy architectural magazine is the start of a book on 'Rescued Buildings: The Art of Living in Former Schoolhouses, Skating Rinks, Fire

Stations, Churches, Barns, Summer Camps, and Cabooes'. The Nippon troll lives in a number of culverts that are his wardrobe, bedroom, library and reading room. The text provides a striking contrast to the pictures. The effect derives entirely from the tension that the power to define the typological classification of the building derives from the use and not from an architect's plan.

The effect is increased by the obvious non-expertise of the user, a fact that continues to be stressed in contemporary texts on change of use: 'Not all building recycling produces glittering centrepieces for official development plans. Squatters, drug dealers and unlicensed businesses unofficially appropriate and convert abandoned structures to new, sometimes illicit, uses' (Dickinson 2004, no pagination). Change of use proves the power of users and even people who usually would never be considered legitimate users. Early on, the activity of the users through *allotyping* was directly opposed to the empirical truth of actual architect-built buildings: 'Adaptive re-use of old buildings is also a form of architectural criticism; people reject many of the new buildings they see, preferring what they have to what they expect to get instead' (Diamondstein 1978, p. 15). As the quote shows, it was also a direct opposition to the idea of prototyping as a test version: The architect's office was suspect because it only produced unwelcome surprises, while the existing buildings could be perfectly adapted to changing needs.

### Third Displacement: Allotyping as a Sign of Pluralist Society

While the first and second displacement used *allotyping* to prove the power of the user, a connected third displacement uses it to disentangle the relationship between buildings and society. For this move, *allotyping* is not so much about the individual user, but about the composite result of the accumulated instances of change of use, namely cities. Change of use operates here not on the small scale of buildings, but on an accumulated scale, which affects contemporary society.

Probably the earliest example of this move provided the German sociologist Hans Paul Bahrtdt in 'die moderne Grosstadt' (The modern city) (1961). Bahrtdt attempted to write a phenomenological sociology that linked contemporary city forms to citizens. Bahrtdt took as his starting point very similar observations as Frankl, but attributed it specifically to the modern city:

The comparatively visual public sphere of the city has lost its importance and is now [*sic*] harder to read. (...) The departure of architecture's actual function from the originally intended one (still visually present) makes the city yet harder to fathom. (...) The unity of the city remains invisible. (Bahrtdt 1961, p. 102)

While for Frankl *allotyping* was a *methodological* problem for art historians, for Bahrtdt it became a sign of modernity related to the image of the citizen. He objected to the modernist idea that buildings should have defined functions that correspond to specific roles: He wrote that buildings should not force humans 'into an inappropriate specialist affectation': If modern, individualistic society should be able 'to represent itself in public space, then it should be able to include a multiplicity of functions. (...) For this reason one should not separate recreation, shopping, fun and going to church in a purist way' (Bahrtdt 1961, p. 103).

With Bahrtdt, *allotyping* became an important indicator of an individualistic society, where architecture would no more attempt to orient, or even push, citizens into pre-configured roles. The disunity of the city, epitomised in conversions, positively corresponded

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to the liberties of citizens. It was not so much the power of the subject over buildings that mattered. Rather the visibly lacking power of buildings became a proof of a distinct form of society. From this lack derived the normative claim that architects and city planners should not attempt to create modernist types. The argument against the modernist idea of types, an idea that notably only emerged in parallel to theories about division of labour and functional differentiation of modern societies, was thus an empirical one: functional differentiation does not occur on the spatial level within cities, and thus should not be attempted.

Almost at the same time, and more famously, Jane Jacobs held that conversions were a positive example of cities providing a stage for the theatre of life in modern societies:

Among the most admirable and joyable sights to be found along the sidewalks of big cities are the ingenious adaptations of old quarters to new uses. The town-house parlor that becomes a craftsman's showroom, the stable that becomes a house, the basement that becomes an immigrants' club.... (Jacobs 1962, p. 194)

For Jacobs the question was not whether or not buildings would force individuals into roles; she viewed this as an impossibility. Such futile attempts only proved how limited planners were:

Who could anticipate or provide for such a succession of hopes and schemes? Only an unimaginative man would think he could; only an arrogant man would want to. (...) These eternal changes and permutations among old city buildings can be called makeshifts only in the most pedantic sense. It is rather that a form of raw material has been found in the right place. It has been put to a use that might otherwise be unborn. (Jacobs 1962, p. 194)

Conversions were visible proofs of the positive, citizen-generated, non-hierarchical nature of cities. 'Intricate minglings of different uses in cities are not a form of chaos. On the contrary, they represent a complex and highly developed form of order' (Jacobs 1962, p. 222). To misunderstand this 'order' cannot result in a social problem because buildings do not have power over society. But it creates an aesthetic problem: for Jacobs, forms are not defined by architects but follow or emerge from their uses. The role of the architects, if there is any, is to give these uses their proper form, not as a deterministic corset, but as they emerge:

Where patterns of human activity contain only one element, it is impossible for the architecture to achieve a convincing variety—convincing of the known facts of human variation. The designer may vary color, texture and form until his drawing instruments buckle under the strain, proving once more that art is the one medium in which one cannot lie successfully. The more homogeneity of use in a street or a neighborhood, the greater is the temptation to be different in the only way left to be different. (225)

For Jacobs, functional homogeneity creates an 'aesthetic dilemma for the city', while 'diversity of uses, on the other hand, (...), does offer the decent possibility of displaying genuine differences of content' (226).

Jacobs and Barth both agree that *allotyping* is a socio-material proof of individualism as a central feature of modern liberal societies. Where they do disagree is with respect to the role of the architect and planner: Barth believes the architect can influence roles of citizens and wants the architect to build cities that actively mix uses; Jacobs believes the



planners influence is limited and wants the architect to stop dressing up actual homogeneity as pseudo-heterogeneity with design.

#### Fourth Displacement: Change of Use Produces Better Buildings

The power of the user then fed back into the valuation of the buildings, and specifically that of changed buildings. If the practices of users were inherently good, and if this applied architectural criticism was taken seriously, then certainly the buildings that users changed should be differently valued. Under the modernist doctrine, old (i.e. pre-modernist) buildings were ugly because they were obviously not results of the modernist technological logic. These old buildings were flawed because the architects built them according to some aesthetic ideal, rather than based on an analysis of users. As users found these converted buildings more practical and more beautiful than modernist buildings, it followed that the old designs were supposedly superior to the new ones.

Whereas the invention of the user from the second to the fourth move denied the technicality of buildings and empowered the user to the degree that the buildings did not really matter anymore, to follow the user and see which building she prefers led to new valuations of buildings. Thus, for example Jacopetti in the book mentioned above criticises 'Victorian residences' because 'space is squandered in elaborate systems of walls and doors to insure that rooms' functions don't get mixed' (Jacopetti et al. 1977, p. 6). He goes on to ask: 'What makes living in rescued building so much better? (...) Each building has its own quality, its own charming or outrageous uniqueness affecting the lives within...' (Jacopetti et al. 1977, p. 6). Ten years later, Mandler declared in a manifesto on change of use:

Change of use sets new elements of architecture free. Elements that do not reveal their meaning and usefulness at first sight are difficult to achieve today. With change of use [...] enough latitude remains to present elements of buildings [...] in a new guise. Like this, they could never be built. [...] The user experiences [the reused elements] like a dash of his fantasy. (Mandler 1989, p. 14)

With this, the very definition of what a building should do shifted: under the modernist doctrine, a building should be fitted around uses; under the new doctrine it should do the opposite – it should be disruptive and surprising, effects that could not be achieved by architects. Architects (and supposedly not only modernist architects, but architects per se), design around uses, but what makes a building interesting and thus usable, is its non-functionality and its capacity to surprise, both features that cannot be designed or planned.

#### Fifth Displacement: The Architect is Inspired by Allotyping

Those celebrating *allotyping* underestimated architects and architectural theorists. Architects soon realised that the problem of fantasy is not only one for the user. The architects themselves needed to re-appropriate change of use as a tool and re-adjust their theories of buildings.

Help arrived from the then emerging discipline of semiotics, particularly from Umberto Eco, one of the foremost semioticians. In his seminal article 'Function and Sign'

(Eco 1986), which first appeared as a chapter of 'la struttura assente' in 1968 (Eco 1968), he extended the notion of function to include semiotic aspects. He introduced the distinction between 'primary, denotative' and 'secondary, connotative' functions (Eco 1986, p. 65). The former related to structural utility, whereas the latter related to symbolic utility. Eco used this distinction to explain that these two do not have a stable relationship and that both can undergo historical changes. Thus, what always belonged together in the modernist theorisations of type and function fell apart under the semioticians' lens. Eco used the throne as an example: the primary function refers to seating, but the secondary function to regality. He explicitly includes change of use as an instance of a lost first function being replaced with another one, where the second functions mix – his example is the cradle from South Tyrol which is used as a magazine holder (Eco 1968, p. 212). The independence of primary and secondary functions led him to the following advice for architects: 'The architect should be designing for variable primary functions and open secondary functions' (Eco 1986, p. 83).

Whereas for Eco semiotics provided a general science of signs, of which architecture was no more than an interesting subcategory, for the architect semiotics became a normative weapon to fight modernist architectural convictions. Thus, the architectural theorist André Corboz uses Eco's insights in a theoretical treatise on change of use to directly attack the modernist idea that functions and meanings should remain congruent and intact: 'One must conclude that the loss of a function does not automatically impoverish the semantic capacity of the architecture' (Corboz 1978, p. 77).

In a programmatic article entitled 'Converting the Past: A Philosophy of Recycling, with Buster Keaton Our Guide' for the architectural journal 'architecture plus', French art historian Pierre Schneider turned this insight into an aesthetic maxim that runs counter to previous ones:

In every case, the act of conversion seems to engender the same magic, the same contagious energy. This is due partly to the shift of function, which, by putting some parts of the building to rest, suddenly upsets our routine blindness and makes explicit their formal characteristics. (...) On the subconscious or symbolic level, we continue to experience the building's previous function, although it may be totally different from, or even opposed to, the new one. We are invited to pass from the linear, logical order of prose to the polyphonic illogic of poetry, for just as prose results from the censoring down of reality to controllable consistency, poetry, far from denying reality, springs from the cultivation of its multiplicity, to the point of incoherence.<sup>5</sup>

His example, then, is not a building but the ship that Buster Keaton as navigator translates from 'an anonymous system into a personal one' (Schneider 1974).

Schneider used change of use to argue for and celebrate everything that later would be known as postmodernism. His arguments, stressing the poetry, the uncontrollable, illogic and polyphony are a perfect example for the romantic reversal of aesthetic values through postmodernist theory: The goal of the analysis was not to find logic, linearity and structure, but instances that *undermine* them, and for Schneider, change of use is *the* proof for the preference for poetry. Thus for Schneider, with the help of semiotics, change of use did not just prove the independence of meaning from use, but it served as an aesthetic maxim for architects: 'poetry' and 'polyphony' are better than 'controllable consistency'. Semiotics helped architects to re-orient their theories of how form and use relate to each

other and it unburdened architects from controlling both. *Allotyping* had travelled back to the architect.

### Sixth Displacement: Architects Attempt to Re-Stabilise Buildings

500 A sixth displacement emerged from drawing quite a different lesson from allotyping. While the fifth displacement focused on the clash of use and form, this displacement focused on the continuity of form irrespective of changing uses. Central to this shift was changing the reference point of analysis from an individual building to the city, as done first by Aldo Rossi in his important book 'the Architecture of the City' written in 1966, to be followed by others including Rowe and Koetter in 'Collage City' (Rossi 1982; Rowe & Koetter 1978). Rossi again starts the book by noting the ubiquity of change of use, as 'large palaces, building complexes, or agglomerations [...] whose function now is no longer the original one' (Rossi 1982, p. 29). Rossi criticised 'functionalism' for its incapacity to acknowledge change of use, and its focus on how form relates to use. According to Rossi, uses change quickly, but forms do not, which renders converted buildings incomprehensible: 'For if urban artefacts present nothing but a problem of organization and classification, then they have neither continuity nor individuality. Monuments [...] have no reason to exist; they do not "say" anything to us' (Rossi 1982, p. 48). This implied a shift in the understanding of type, from the relationship between buildings and their use, to how buildings are to be understood within their historical urban contexts. For Rossi, converted buildings are still meaningful, despite their broken link with use because they are part of a historically developed cityscape. Allotyping thus opened a new mode for understanding buildings: It did not matter how they were used now, but how they became part of the fabric of the city, how they related to their immediate surroundings and how their form type had historically evolved: 'The city is something that persists through its transformations, and [...] the complex or simple transformations of functions that it gradually undergoes are moments in the reality of its structure' (Rossi 1982, pp. 55–56). While for Schneider conversion produced illogic, Rossi only changed the reference point from use to the city to make it logic again.

525 It was Charles Jencks in 'The Language of Post-Modern Architecture', the text that gave postmodernism its name in architecture itself, who turned this notion of change of use onto itself. Echoing to Rossi, Jencks starting point was a diagnosis drawn from semiotics: 'A failure of recent architecture has been one of communication', rather than function or use (Jencks 1977, p. 7). The semiotic analysis led him, as all the other authors, to the empirical observation of the normality of change of use:

535 While a building may stand 300 years, the way people regard and use it may change every ten years. It would be perverse to rewrite Shakespearean sonnets, change love poetry to hate letters, read comedy as tragedy; but it is perfectly acceptable to hang washing on decorative balustrades, convert a church into a concert hall, and use a building every day while never looking at it (actually the norm). (Jencks 1977, p. 50)

As Eco before him, Jencks observes the particularity of buildings as opposed to other art objects: *allotyping* is a particularly interesting problem with buildings because the relationship of the user to buildings is different to that of her relationship to poems. But Jencks is unique, and as we know in hindsight, extremely influential in the lessons he

540 draws from insights about allotyping. Unlike Rossi, he is not concerned with the continuity of the cityscape, but again with individual buildings:

One implication of this for architecture is that the architect must over-code his buildings, using a redundancy of popular signs and metaphors, if his work is to communicate as intended and survive the transformation of fast-changing codes. (Jencks 1977, p. 50)

545 He here pointed out that many architects have difficulties with this because 'they find it nonfunctional and personal, literary and vague, certainly not something they can consciously control and use appropriately' (Jencks 1977, p. 50). The problem of control returned as a second order problem: how to control the uncontrollable? But he failed to point out, what I have tried to analyse throughout this text, that the problem of control referred to use, which then gave rise to the problem of allotyping itself. Jencks was not  
550 interested in use. Uses were ephemeral; they came and went and were outside the range of the architect. Why consider uses, if they disappeared faster than one could study them? The flimsiness of uses was merely an aesthetic problem for the architect, since she could control only the building.

555 The results of Jencks and Rossis insights are well known, and they precisely show that the problem of control has not been tackled. The result is called 'postmodern architecture'. It is based on the idea that signs can overcode a building both in a historical and typological manner. In Rossi's case, it resulted in buildings that prioritised continuity with the cityscape as a historically evolving entity over any relation to their use. In Jencks' more radical case, it led him to champion buildings that demonstrate the arbitrariness of  
560 singular forms: Buildings that look like roman villas but are in fact social housing and classicist palaces that are banks, and so on. It is the end of types as we knew them, as mirrors of their uses and as attempts to stabilise society. As I have shown, one of their birthplaces was the idea that the user, not the architect, defines a building. The lesson that the architects have learned from all of this forgets the user again, but the discourse that change of use is something good has stayed with us since then, although we do still have  
565 no proof why this is so. Among other things, it has brought newly built lofts, i.e. newly built flats that pretend they were converted warehouses.

### 570 **Seventh Displacement: Society Strikes Back: Post-modern Buildings as Proof of Individualism**

Ironically, in this last displacement, society strikes back again: Fredric Jameson turned everything around once more in his famous article on postmodernism as 'the cultural logic of late capitalism' (Jameson 1984). Post-modernism as a style became a proof of the *disunity* of the city and of postmodern society. Jameson draws on semiotics too; he  
575 wants to read the form of society from the materialised signs of architecture. His general semiotic lead is 'the breakdown of the signifying chain' (Jameson 1984, p. 71). He looks at the results of Jencks' advice to architects and is perplexed by new forms derived from a lack of surface, a 'historicism [that] effaces history':

580 Yet from the outset a whole battery of aesthetic signs begin to distance the officially contemporary image from us in time: the art deco scripting of the credits, for example, serves at once to programme the spectator for the appropriate "nostalgia" mode of reception. (Jameson 1984, p. 67)

He analyses at length the Bonaventure Hotel by John Portman as a prime example of postmodern architecture, its glass skin as 'a peculiar and placeless dissociation [...] from its neighbourhood' (Jameson 1984, p. 82) and its elevators and escalators as 'that allegorical signifier of that older promenade we are no longer allowed to conduct on our own' and as a 'dialectical intensification of the autoreferentiality of all modern culture' (Jameson 1984, p. 82). All these led him to conclude that the Bonaventure as an example of 'postmodern hyperspace' 'has finally succeeded in transcending the capacities of the individual human body to locate itself, to organize its immediate surroundings perceptually, and cognitively to map its position in a mappable external world' (Jameson 1984, p. 83). For Jameson, Post-Modernity is a societal condition of confusion defined as 'the incapacity of our minds, at least at present, to map the great global multinational and decentred communicational network in which we find ourselves caught as individual subjects' (Jameson 1984, p. 84) and this societal condition is driven by, and mirrored in, an architectural style.

For Barth and Jacobs, modernity itself was a societal condition of confusion, which explained why *allotyping* was good. For Jencks, Post-Modernism was a stylistic trick to give power back to the architect and to stabilise interpretations that should overrun the functional confusion that result from it. For Jameson, it is exactly the opposite: not *allotyping* itself, but the postmodernist buildings, which result from accepting *allotyping* as a social fact, confuse the viewer and have become symbols of a disintegrated society. The circle had closed. *Allotyping was invisible again.*

But it reappeared, although in metaphorical form, when Jameson wrote:

Heidegger's 'field path' is after all irredeemably and irrevocably destroyed by late capital, by the green revolution, by neocolonialism and the megalopolis, which runs its superhighways over the older fields and vacant lots, and turns Heidegger's 'house of being' into condominiums, if not the most miserable unheated rat-infested tenement buildings. The other of our society is in that sense no longer Nature at all, as it was in precapitalist societies, but something else which we must now identify. (Jameson 1984, p. 77)

Jacobs, Barth and Schneider identified this 'something else' precisely as *allotyping*, as a poetic and surprising undertaking by users and as a loss of control of architects. But because Jameson has no concept of use, Heidegger's 'house of being' in Jameson's hands can only be transformed by structural megaprocesses in the guise of 'neo-colonialism' and suffer from a yuppified upgrade. At least in this respect he was in line with Jencks. He only saw buildings, which were determined by architects as executors of neo-colonialism and the megalopolis, while the inhabitants of buildings, Heidegger and us, had no power over those buildings at all.

## Conclusion

With Jameson's Heidegger's 'house of being' turned into a condo, I have arrived as far away from 'prototyping' as possible. The condo is the stabilised middle-class parody of the two central elements that prototyping implies: trial and user participation. It is the architect-developer designed impression of trial versions and surprise, for those who cannot dare to be surprised. Yet, the story I told is an indicator for the difficulties one encounters, once *allotyping* gets into view. What buildings can do and cannot do becomes suddenly an impossibly complex issue, in which empirical and normative ideas about the

connection between architects, modernity, cities, buildings, forms and user are far from obvious. With buildings and cities, it is difficult to know who is in power and even more difficult to know what should be designed, and by whom, to arrive at good results. As the history of the discourse on *allotyping* teaches, it may even be better if architects try to impose buildings on users. Not because such an attempt in itself is successful, but because the on-going failure of such attempts provides surprises, and allows users to act differentially. This is not an argument against the involvement of users, but the surprising lesson from *allotyping* is that if users take the lead, they may turn out to be disappointed from the surprises they themselves have tried to evade. According to this diagnosis, prototyping failed before it really began, but *allotyping* has always existed and will never stop to surprise.

## NOTES

1. Obviously, there is tremendous change in both design tools and building materials, but none of it has anything to do with the invention of change of use. The irony of the story is rather that the invention of change of use was in part a result of the *failed* hopes of a particular technological invention, namely the computerization of design practices in the 1960s (Fezer 2011).
2. The best starting point in the literature are probably the chapters on 'function' and 'type' in Forty (2000).
3. For an overview of the many different notions of type within architecture, see Franck and Schneekloth (1994).
4. On the history and tremendous influence of 'the Neufert' throughout the twentieth century, see Prigge (1999).
5. This became the standard argument in favour of change of use, repeated ad infinitum, see for example Brand (1995, p. 104 f.), Robert (1989, p. 4 f.) or Jones (2001).

## REFERENCES

- BAHRDT, H. P. (1961) *Die moderne Grossstadt. Soziologische Überlegungen zum Städtebau*, Reinbek/Hamburg: Rowohlt Taschenbuch Verlag. AQ7
- BLUNDELL JONES, P. (ED.) (2005) *Architecture and Participation*, London: Spon Press.
- BOUDON, P. (1969) *Pessac de Le Corbusier*, Paris: Dunod. AQ8
- BRAND, S. (1995) *How Buildings Learn: What Happens after They're Built*, New York: Viking.
- CORBOZ, A. (1978) 'Old buildings and modern functions', *Lotus International*, Vol. 13, pp. 69–79.
- CORSÍN JIMENEZ, A. & ESTALELLA, A. (2010) 'The prototype: a sociology', in *Limn 01: Prototyping Prototyping*, ed. Abeyance C. KELTY, Vol. 1, no. 1. Available at: <http://anthropos-lab.net/studio/the-prototype-a-sociology-in-abeyance/> [accessed 6 November, 2011].
- DASTON, L. & GALISON, P. (2007) *Objectivity*, New York: Zone Books.
- DIAMONSTEIN, B. (1978) *Buildings Reborn. New Uses – Old Places*, New York: Harper & Row.
- DICKINSON, J. (2004) 'Adaptive reuse: towards a sociology of the built environment', *American Sociological Annual Meeting*. San Francisco.
- DURAND, J.-N.-L. (1821) *Précis des leçons d'architecture. Données a l'école royale polytechnique*, Paris. AQ10
- ECO, U. (1968) *La struttura assente: Introduzione alla ricerca semiologica*, Milano: Bompiani. AQ11



- 670 ECO, U. (1986) 'Function and sign: the semiotics of architecture', in *The City and the Sign: An Introduction to Urban Semiotics*, eds, M. GOTTDIENER & A. P. LAGOPOULOS, New York: Columbia University Press, pp. 55–86.
- FEZER, J. (2011) *Deprofessionalisierungstendenzen (damals, in der Entwurfsmethodik)* A. BRANDLHUBER & S. LINDEN, EDS., Nürnberg. Available at: [http://www.a42.org/fileadmin/\\_img/disko/disko\\_24.pdf](http://www.a42.org/fileadmin/_img/disko/disko_24.pdf). AQ12
- 675 FORTY, A. (2000) *Words and Buildings: A Vocabulary of Modern Architecture*, London: Thames & Hudson.
- FRANCK, K. A. & SCHNEEKLOTH, L. H. (EDS.) (1994) *Ordering Space: Types in Architecture and Design*, New York: Van Nostrand Reinhold.
- 680 FRANKL, P. (1968) *Principles of Architectural History: The Four Phases of Architectural Style, 1420–1900*, Cambridge, MA: MIT Press.
- GERHARDS, J. (2001) 'Der Aufstand des Publikums. Eine systemtheoretische Interpretation des Kulturwandels in Deutschland zwischen 1960 und 1989', *Zeitschrift für Soziologie*, Vol. 30, no. 3, pp. 163–184. AQ13
- GOODMAN, R. (1972) *After the Planners*, Harmondsworth: Pelican.
- 685 GREGORY, S. A. (ED.) (1966) *The Design Method*, London: Butterworths.
- GUGGENHEIM, M. (2009) 'Mutable immobiles. Change of use of buildings as a problem of quasi-technologies', in *Urban Assemblages. How Actor Network Theory Transforms Urban Studies*, eds, I. FARIAS & T. BENDER, London: Routledge.
- 690 GUGGENHEIM, M. (2010) 'The long history of prototypes', *Limn 01: Prototyping Prototyping*, Vol. 1, no. 1. Available at: <http://anthropos-lab.net/studio/the-long-history-of-prototypes/>.
- HENKET, H.-J. & HEYENEN, H. (EDS) (2002) *Back from Utopia: The Challenge of the Modern Movement*, Rotterdam: 010 Publishers. AQ14
- HEYENEN, H. (1999) *Architecture and Modernity: A Critique*, Cambridge, MA: MIT Press.
- JACOBS, J. (1962) *The Death and Life of Great American Cities*, London: Cape.
- 695 JACOPETTI, R., VANMETER, B. & MCCALL, W. (1977) *Rescued Buildings: The Art of Living in Former Schoolhouses, Skating Rinks, Fire Stations, Churches, Barns, Summer Camps, and Caboozes*, Santa Barbara: Capra Press.
- JAMESON, F. (1984) 'Postmodernism: the cultural logic of late capitalism', *New Left Review*, Vol. 146, pp. 53–92.
- 700 JENCKS, C. (1977) *The Language of Post-Modern Architecture*, London: Academy Editions.
- JOKUSCH, P. (1984) Architektur für den Nutzer - Gebrauchsarchitektur. In P. Jokusch, European Association for Architectural Education Workshop, & Gesamthochschule (Kassel) Fachbereich Architektur, eds. *Architektur für den Nutzer - Gebrauchsarchitektur. Ergebnisbericht 6. EAAE Workshop, Kassel Nov. 1982 report*. Kassel: Gesamthochschulbibliothek, pp. 16–24. AQ15
- 705 JONES, P. B. (2001) 'Working with the given', *Issues*, Vol. 5, no. 3, p. 305.
- KRAMER, L. (1986) 'Rationalisierung des Haushaltes und die Frauenfrage - die Frankfurter Küche und zeitgenössische Kritik', in *Ernst May und das Neue Frankfurt 1925–1930*, eds, R. HÖPFNER et al., Berlin: Wilhelm Ernst & Sohn, pp. 77–84. AQ16
- LE CORBUSIER (1943) *La Charte d'Athènes*, Paris: Plon. AQ9
- 710 MARKUS, T. A. (1993) *Buildings & Power: Freedom and Control in the Origin of Modern Building Types*, London: Routledge.
- MANDLER, A. (1989) 'Thesen zur Umnutzung alter Bausubstanz', in *Stadt erhalten - Stadt gestalten. Planen und Bauen im Bestand. Dokumentation von Kongressen im Rahmen der Altbau Neu '88 in Essen und RENOVA '88 in Hamburg*, eds, I. FLAGGE & C. STECKEWEH, Gütersloh: Bertelsmann Fachzeitschriften, pp. 13–17. AQ17
- 715

## 22 MICHAEL GUGGENHEIM

- MEYER, H. (1928) 'Bauen', *Bauhaus*, no. 2, pp. 12–13. AQ18
- MITSCHERLICH, A. (1965) *Die Unwirtlichkeit unserer Städte. Anstiftung zum Unfrieden*, Frankfurt am Main: Suhrkamp. AQ19
- NEUFERT, E. (1936) *Bauentwurfslehre. Grundlagen, Normen, Vorschriften über Anlage, Bau, Gestaltung, Raumbedarf, Raumbeziehungen, Masse für Gebäude, Räume, Einrichtungen, Geräte mit dem Menschen als Mass und Ziel. Handbuch für den Baufachmann, Bauherrn, Lehrenden und Lernenden*, Braunschweig: Vieweg. AQ20
- O'CONNELL, L. M. (1995) 'Redefining the past: revolutionary architecture and the Conseil des Bâtiments Civils', *The Art Bulletin*, Vol. 77, no. 2, pp. 207–224.
- OLIVER, P. (2006) *Built to Meet Needs: Cultural Issues in Vernacular Architecture*, Amsterdam: Elsevier. 725
- PEVSNER, N. (1976) *A History of Building Types*, Princeton: Princeton University Press.
- PRIGGE, W. (ED.) (1999) *Ernst Neufert. Normierte Baukultur im 20. Jahrhundert*, Frankfurt/Main: Campus Verlag. AQ21
- QUINCY, Q. DE (1788) 'Type', in *Encyclopédie méthodique*, ed., Q. de QUINCY, Tome 3: Panckoucke, pp. 543–545. AQ22
- ROBERT, P. (1989) *Reconversions: New Uses for Old Buildings*, Paris: Editions du Moniteur.
- ROSSI, A. (1982) *The Architecture of the City*, Cambridge, MA: MIT Press.
- ROWE, C. & KOETTER, F. (1978) *Collage City*, Cambridge, MA; London: MIT Press.
- RUDOFISKY, B. (1969) *Architecture without Architects*, New York: Doubleday.
- RUNBERGER, J. (2008) *Architectural Prototypes: Modes of Design Development and Architectural Practice: Projects: Contexts*. PhD Dissertation. Stockholm: KTH School of Architecture.
- SCALBERT, I. (2011) 'The architect as Bricoleur', *Candide, Journal for Architectural Knowledge*, no. 4, pp. 69–88. AQ23
- SCHNEIDER, P. (1974) 'Converting the past: a philosophy of recycling, with Buster Keaton Our Guide', eds, S. ABERCROMBIE, J. MICHENER, & J. MEIER, *Architecture Plus*, Vol. 2, no. 2, pp. 62–67.
- SLATON, A. E. (2001) *Reinforced Concrete and the Modernization of American Building, 1900–1930*, Baltimore: Johns Hopkins University Press.
- SMITH, M. R. & MARX, L. (EDS) (1994) *Does Technology Drive History? The Dilemma of Technological Determinism*, Cambridge, MA: MIT Press. 745
- SOMMER, R. (1974) *Tight Spaces: Hard Architecture and How to Humanize It*, Englewood Cliffs, NJ: Prentice-Hall.
- TANGE, K. (1965) *Ise, Prototype of Japanese Architecture*, Cambridge, MA: MIT Press.
- VANDEBURGH, D. J. T. & ELLIS, W. R. (2001) 'A dialectics of determination: social truth-claims in architectural writing, 1970–1995', in *The Discipline of Architecture*, eds, A. PIOTROWSKI & J. W. ROBINSON, Minneapolis: University of Minnesota Press, pp. 103–126.
- VOLLAARD, P. (2007) *Prototypes: The Work of Cepezed: Product Process Architecture*, Rotterdam: 010 Publishers. AQ24

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