The Making of a Building : a pragmatist approach to architecture

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Contents

List of Illustrations

Acknowledgements

Introduction

Rotterdam. A morning walk on the Heer Bokelweg, unspoken good morning greetings to unknown pedestrians. You reach building number 149 having just passed a mini exhibition of models: staged on the ground floor and visible from the outside because of the large windows, the models are made accessible to the people of Rotterdam. Moving silently past the 'open' exhibit on the ground floor of the Office for Metropolitan Architecture (OMA), the passers-by gaze at their own silhouettes in the windows, without really seeing the models. The models 'stare' at the public without noticing their mirror reflections. Static models inside face pedestrians outside; both remain uninterested in crossing the limpid divides.

You walk further on, and a glass door opens onto a large foyer. You enter. Another little walk to the elevator; it rings, silence ... You are in. You wait until a tentative reddish light flashes on the number 'seven'; as the door opens you find yourself facing the reception desk of the OMA; more greetings, this time spoken, another walk, this time accelerated. You cross a huge one-room space, which looks like a 'deserted battlefield' after the previous evening's intense bout of work. You pause for a while, and you look at the particular arrangements of models and drawings, sketches, paper cut-outs and foam leftovers scattered around tables, bookshelves, garbage containers, and even on the floor and in the kitchen. Coffee smell is in the air, good morning greetings again, you walk, again ...

A big terrace increases the one-room office space that stretches over the whole floor; a splendid view over Rotterdam can be seen from there. Another beautiful urban panorama is visible behind the desk of Rem Koolhaas. Yet, instead of staring at the city, he surveys the internal office spaces, where architects are involved in frantic activities such as cutting various materials, scaling up and down small tangible models, and manipulating images on screen.

In the middle of the office, on a huge table, various scale models of a building, its parts and detailed variations are installed: a display lit by neon

light; a solemn spectacle waiting to be discovered by invited visitors only. Reproduced in various samples, colours and shapes, the models are kept in this particular arrangement during the design process (Figure 1).

Figure 1: The table of models (photograph by the author)

'This is the Whitney project', Rem Koolhaas tells visitors as they view the colourful assemblage on the table. These models illustrate different facets of the building; visualizing scenarios, issues, and possibilities that have been tested. No single starting point triggering a linear series of models or elements can be found, but this is not a chaotic assembly of scattered leftovers from the conception process. What we see on the different parts of the table are diverse concentrations of models, intensities of detail, variations and images. Separated by different spatial intervals, they form a network of points and passages presenting different vantage points on the same building. Each one shows (in a particular geometric configuration) a representational state of the NEWhitney project – the extension

to the Whitney Museum of American Art in New York, which Koolhaas has been commissioned to create.

Following my first visit to the OMA on that November morning in 2001, I joined the Whitney team and followed the architects as they worked on the project. Rotterdam. Walk on Heer Bokelweg, walk to the elevator, walk through the office space, and walk to the tables of models, and walk, again, back and forth among the tables of models in the office. After repeating this little ritual for months, I, a humble anthropologist of architecture, found myself entirely subservient to the architects' rhythm of work. I followed them through all the tribulations of the design process. Gaining ethnographic access to this field required me to 'live' in the architectural office, confronting various enigmas in the design process. I decided to follow the tiny modelling operations and how knowledge is acquired through design, to make them ethnographically describable, and understand how the particular architectural object – the Whitney Museum extension – will be conceived and eventually realized.

To Study the Pragmatics of Design

Design and urban planning are often understood as a form of technology, and in this context a building is considered as a kind of technological artefact. Buildings are being investigated after-the-fact of their construction, not *in the process* of planning and designing.[1] One particular subject still

1   Some attempts to explain the city into the limelight of social studies of technology have been done applying a constructivist perspective to the analysis of town-planning innovation and urban change (see Aibar and Bijker, 1997). A dialogue of urban studies and STS was triggered by the recent studies of obduracy and urban change (see Hommels, 2005) and the phenomenon of splintering urbanism (see Graham and Marvin, 2001). Tackling the relationship between quality of space and quality of science and scientific identities, some recent studies strove also to enrich *post hoc* readings of finished buildings by reconstructing (through interviews and archives)

seems to be left aside: the actual dynamics of architectural design process and its material, cognitive and cultural dimensions.

Following the designers from the office of Koolhaas over a period of two years, this book aims at shedding light on the social and cognitive complexity of 'architecture in the making' and follows the drifts in the design and planning process of some of the recent extension proposals for the Whitney Museum. Accounting meticulously of the architects' moves, I will expose the materialization of successive design operations and will trace the developing appearance of the NEWhitney and the production of numerous intermediary design objects. Thus, the OMA will be studied here in the same way that the Science and Technology Studies (STS) have approached the laboratory and the practices of scientists (Latour and Woolgar, 1979; Lynch, 1993; Knorr-Cetina, 1999). Like these authors who in numerous occasions accounted science in the making to understand the process of fabrication of scientific truth and facts, scientific visualization and the material operations that accompany scientific work, I will follow architects in their 'architectural laboratories' to understand architectural thinking, results from experiments with materials and shapes, measurements with physical models, presentations for clients and users, reactions to mock-ups, and community protests to design.[2] Inspired also by some

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the design decision process that lead to their physical construction (see Gieryn, 2002; Henderson, 2006, 2007). Looking at the design of scientific buildings and their planning process (see Gieryn, 1999, 2002), they have convincingly demonstrated to what extent the power of laboratories depends upon sequestrations achieved with walls and doors, and explored how architecture might challenge or compromise the cognitive authority of experimental science (see Gieryn, 1998; Shapin, 1998; Galison and Thompson 1999; Martin, 2005; Murphy, 2006).

2   Over the past twenty years, STS have closely followed scientists, engineers, physicians, managers in and out of their workplaces, but remained indifferent to architects and urban planners, and their activities in the design studio, in the model shop, at public presentations, and on the construction site. In a series of programmatic articles Michel Callon advocated the importance of an Actor-Network-Theory (ANT) perspective for the understanding of architectural conception. Arguing that 'the results of anthropology of science and technology are *transportable*' to the filed of architectural studies, he focused on the materiality of design as a world of graphs and strategies

recent studies on engineering design (Vincenti, 1990; Ferguson, 1992; Bucciarelli, 1994; Henderson, 1999; Vinck, 2003),[3] I will tackle the practices of designers at work by emphasizing the complex social dynamics of the design process.[4]

The book revolves around the question: How do architects learn about an extant building and its unknown, projected and anticipated extension that is *to be added*? As an anthropologist of the Modern, I follow architects at work to identify different ways of gaining knowledge about a building.[5]

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of visualization, grounded in negotiations (see Callon, 1996, 1997). However, no detailed studies of architectural practices, as seen through an ANT limelight have followed. Few exceptions are studies of architectural thinking and negotiation in design and building development projects (see Yaneva, 2005b; Houdart, 2006). In addition, different criticisms to this programme were addressed from theoreticians of architectural practices (see Raynaud, 2001). Nevertheless, no empirical alternatives were suggested even though the interest in the logistics of the architectural projects has grown (see Bonnet, 1997; Prost, 1999) and these were always tackled in the traditional lens of sociology of the architectural profession (see Champy, 2001). In the English-speaking world, too, a more traditional sociological perspective was applied to understand the social underpinning of design and production activities (see Blau, 1984), or the products of architectural design as socially constructed negotiations among architects and an array of contributors (see Cuff, 1991).

3   These studies contributed to a better understanding of the visualization practices, instruments, communication and design environment, as well as the distributed cognition and the material culture of designing engineers, drawing on the way STS engaged in analysis of scientific culture and practices of visualization (see Lynch, 1985, 1993; Lynch and Woolgar, 1990; Latour, 1990; Pickering, 1992; Galison, 1997).

4   This book draws also considerably on the exchange of ideas between history of science from one side, and architectural and urban studies from the other (see special issue of the Journal of History of Science *Osiris*, volume 18, 2003 and volume 19, 2004; Ophir et al., 1991; Mukerji, 1997, 2002; Galison and Thompson, 1999; Livingstone, 2003, 2005; Picon and Ponte, 2003; Gieryn, 2006).

5   Bruno Latour has put a provocative research programme for anthropologists: the challenge of symmetrical anthropology, or anthropology of the Modern (see Latour, 2007). Symmetrical (or diplomatic) means that it puts into question both the idea of nature and that of culture and their multiplicity without prioritizing a *privileged* point of view. After a fieldwork in Abidjan, Latour has decided to study the Roger Guillemin laboratory at the Salk Institute in California and 'to apply ethnographic

Relying on the assumption that buildings are pragmatically knowable not symbolic, I present and discuss the strategies architects employ to make a building knowable: the historical design enquiry (Chapter One and Chapter Two), the work with models and other visuals (Chapter Three), the option process and the public presentation (Chapter Four). Tracing the continuity of the architectural networks – in their historical entanglements and actual design challenges – I will show that a building is not obtained in an astute double-click moment of invention, but through numerous little operations of visualization, scaling, adjustment of instruments, options' production and selection, office presentations, historical comparisons and interpretations. Recollecting the social career of a building, re-enacting design moves, producing and circulating visuals, presenting and discussing them with a variety of publics, architects *simultaneously* learn how to modulate social relationships, how to take lessons from the social trajectory of a design object, how to anticipate group reactions, how to incorporate them into design. As the chapters unfold, I will show that at each stage

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methods to scientific practice'. This decision had a significant effect on his actual conception of an anthropo*logical* project. Summing up western history in the provocative statement 'we have never been modern', Latour (1993) argued that Moderns are 'attached, immersed and implicates to ever greater degrees in the most intimate properties of evolving cosmoses. Sciences, far from presenting us the cold and indifferent countenance of absolute objectivity, offer instead the aspect, which is actually familiar to us, of a rich production of associations and attachments with beings of varied ontological status and of always greater relativity' (see Latour, 2007, p. 16). Thus, the task of anthropology, and especially of symmetrical anthropology would consist in studying the Modern, or as Latour calls them ironically 'the White', whose activities and beliefs, obsession with time, novelty, innovation and progress, and the extraordinary inconsistency in their definition of themselves, present an interesting enigma for anthropologists. Faithful to this project, he spent thirty years studying North Americans, Europeans, French and their exoticism (and more specifically automatic metro systems, the Supreme Court, religious speeches, Louis Pasteur or political representations). Questioning *what matters to* Modern and *what truly defines them*, the anthropology of the contemporary world (that is the future of anthropology) will contribute, denotes Latour, to a far-reaching modification of Europeans' self-representation.

of design enquiry and experimentation new data about the Whitney are gained, new actors and design requirements *are to be added*.

The arguments developed through the chapters rely also on a theory of interpretation (Tamen, 2001; Daston, 2004). The notion 'interpretation' does not point to the human mind, but to the objects, to the world. It is the Whitney building itself that is 'open to interpretation' and that lends itself to operations of interpretation not because of the weakness of limited designers' minds but because of the building's own activities. To extend means to interpret, to extract meaning and speech from an object that usually does not talk, but which remains beguilingly interpretable – the Whitney Museum. Moreover, to extend means to perform this meaning, as an actor would a dramatic role and a musician a piece of music, in a way that conveys the understanding of the Whitney's founders and its subsequent architects. Two strands of analysis are followed: on the one hand, in the historical enquiry new interpretations of the Whitney building *are added*; on the other hand, new requirements and concerns about its extension *pile up* in design as models are fabricated, scaled up and down and evaluated by clients and users. The architects commissioned to design an extension play the role of interpreters, of friends of this interpretable object, who do not just gather around its images, or, since it is a building, in its premises, but who attach meaning to it through design enquiry, and reappraise, continue and reassemble it in a new architectural composition named *addition*.[6] The 'addends', the 'things to be added' and collected in our account are models and people, city and client's requirements, public concerns and foam cutters, a reality that gets composed afresh, and is augmented as the story develops. What I will *give to* the Whitney are more interpretations as more actors join the story; what these protagonists *will give to* this building are more voices, vantage points and concerns.

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6   'Addition' and 'add' are English conjugations of the Latin verb *addere* – a compound of *ad* 'to', and *dare* 'to give' (from the Indo-European root *do* – 'to give'). Thus, 'to add' is *to give to*.

The Social Life of the Whitney Museum as a Design Object

The fate that befalls many buildings is that they are simply ignored; they never arouse public attention or cause disputes and controversies. Yet, the Whitney Museum of American Art is a building that has caught the attention of the public and caused controversies and disagreements since the very beginning of its social life.[7] Founded by Gertrude Vanderbilt Whitney in 1930 with the aim of emphasizing the work of living American artists, the Whitney first opened its doors to the public in 1931 in four brownstones at 10 West 8th Street in New York. The museum was discussed again and again over the decades that followed. Discussions regarding the Whitney's design were especially prevalent in three different periods.

The first big controversy was in the 1960s, when the museum acquired its current building designed by the Bauhaus-trained architect Marcel Breuer together with Hamilton Smith. Many astonished and scandalized New Yorkers who followed the museum's construction disliked it as soon as it was raised at the corner of Madison Avenue and 75th Street in Manhattan. They considered it to be too strong a 'modernist statement' in a neighbourhood of traditional limestone, brownstone and post-war apartment buildings. Regarded as sombre, heavy, and even brutal at the time of its completion in 1966, 'an inverted Babylonian ziggurat' entirely disparaged by the public in the early years, the Breuer building was later recognized as daring, strong, and innovative.[8]

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7   I refer here to Appadurai's term of 'social life of objects'. He argues that things-in-motion, like human beings, have a 'social life', a career, a biography, and that material culture does not possess a stable identity (see Appadurai, 1986).

8   Examining different controversies in American architecture one can notice the same tendency: a discrepancy between what is seen on design plans, drawings and models and what is seen further on, when the building is constructed on the site. As the building takes shape, public opinion about it changes and the public (citizens, community, architects, professional critics, politicians) begins to reappraise it, with some positive opinions shifting to the negative and vice versa. For instance, The East

The second vigorous controversy was triggered by Whitney's re-design plans. They began shortly after the building was erected in 1966: the museum had only ten years of projected growth, which was quickly reached. It was not able any longer to provide the necessary design flexibility of the internal display, space was judged to be insufficient; curators and artists expressed their concern that in order to design a new exhibition they often had to work against the system of the building. A possible expansion was discussed in 1978; a year later, in 1979, the commission for a first extension was awarded to Derek Walker Associates and Foster Associates. From this moment on 'expansion' became the key word in the Whitney's architectural history, and the museum was drawn into a long course of extension trials launched officially in the 1980s with the commissioning of Michael Graves.

When Graves presented his plans they were widely debated over the course of the following decade (1981–9). At the time – when architectural criticism was born in the US – it was so rare to have an opinion on a building expressed in the press that it almost did not matter if buildings were considered good or bad; what mattered more was that they were being discussed at all.[9] Graves made three succeeding design proposals

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Building, National Gallery of Art, Washington DC (architects Pei and Partners, 1968–78) received many positive reactions at the beginning, but the critics' opinions became negative when the building was inaugurated in 1978. Even the features that were thought to be its main advantage - such as the fact that the building was carefully designed to fit the site - were later seen as flaws rather than virtues (see Marder et al., 1985).

9   Drawing on the analysis of a variety of case studies in American Architecture in the 1970s and 1980s, and the involvement of the public in these debates, Marder and co-authors (1985) showed *how* the presentation of a design project can suggest a number of reactions concerning its public approval. Commenting on the quality of architectural criticism and the figure of the architect as a public personality – largely presented in newspapers, on TV, in the professional architectural press, and in local and national news media – these authors engaged in analyses of the representational techniques and materials according to which a project is judged in the press (usually evaluated on the merits of renderings and other flat images). They argued that the times, not the buildings, made these controversies.

but they all sparked controversy since they aimed to demolish the adjacent brownstones. Because of this they had to have the approval of the Landmarks Preservation Commission,[10] the City Planning Commission and the Board of Estimate.[11] Graves presented his first extension plan in 1985 and was then lead to rescaling and redesigning the proposal in 1987; his third extension proposal – the last attempt to scale down the building – was turned down in 1989.

In 2001, a new architect, the Prizker prize laureate Rem Koolhaas, was commissioned to design the long-awaited extension.[12] Entrusting the museum's future to the cutting edge of architectural excellence, the Whitney Board was convinced that the Koolhaas project for a NEWhitney 'will raise New York architecture to a level that hasn't been seen since the 1960s'.[13] In the period 2001–4 Koolhaas developed two different design schemes, which were subsequently presented to the Board of Trustees of the Whitney Museum. The first – scheme A – had a long 'life' in the office,

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Analyzing a large corpus of articles in the architectural press from the same period that deal with different aspects of the built environment, Wayne Attoe (1978) distinguished three types of architecture criticism: normative, interpretative and descriptive. According to him for the most part architecture critics had been effective only when talking about specific buildings after the fact of design and construction. Criticism would always be more useful, denoted Attoe, when it informed the future than when it scored the past. He advocated a more purposeful and forward-looking type of criticism that could influence current decisions.

10   Founded in 1965, the Landmarks Preservation Commission is granted power to designate and regulate individual landmarks and development within historic districts. The Madison Avenue preservation district, where the Whitney is located, was designated a special district on 20 December 1973 by the New York City Planning Commission.

11   The Board of Estimate is a governing body in many counties and municipalities of the United States. Its powers are usually concentrated in such areas as taxation and land use (especially zoning laws).

12   It was assumed that the project would progress through a conceptual design stage, schematic design, design development, construction documentation and bid stages, all within approximately a thirty-month period, commencing in January 2002. I followed only the conceptual design stage.

13   OMA Archives.

and although the project was never made public, it travelled widely and was discussed among a variety of participants involved in the design of the NEWhitney: engineers, cost evaluators, stage designers, representatives of the city authorities, the Landmarks Commission, the City Planning Commission, architects and museum professionals. Considered thrilling but expensive, scheme A returned to the Koolhaas office and had to answer a 'siren's call for pragmatism':[14] it was scaled down to fit a smaller budget. Later, scheme B – which was derived from a new configuration of the site's and client's parameters – was designed, presented, evaluated, cost-estimated, and finally considered as inappropriate – and turned down. At the time of writing, another architect, Renzo Piano, is still striving to draw out the profile of an extended Whitney Museum.

How did the Whitney museum look in the 1960s? What kinds of changes have been anticipated on its fabric from that moment on and what shapes did its extensions take through time? What types of relationships with the original building were envisioned in design during the different time spans?

To tackle visually these questions, one could use a projectogram[15] of the series of anticipated transformations of the existing Whitney Museum that would account for the building's life.

14   E-mail from the Whitney Museum director Max Anderson to Carol from 6 September 2002.
15   The projectogram draws on the idea of sequential studies of buildings of Stewart Brand (see Brand, 1994) who suggested that architecture should redefine its job as 'the design-science of the life of buildings', meaning long-term follow-up of buildings. According to him the series of changes of a building could be grasped by sequential re-photography of buildings (which he did by stepping into the exact point of view of an old photograph).

Figure 2.1: The Whitney projectogram: Whitney Museum
(photograph by Nick Dunn)
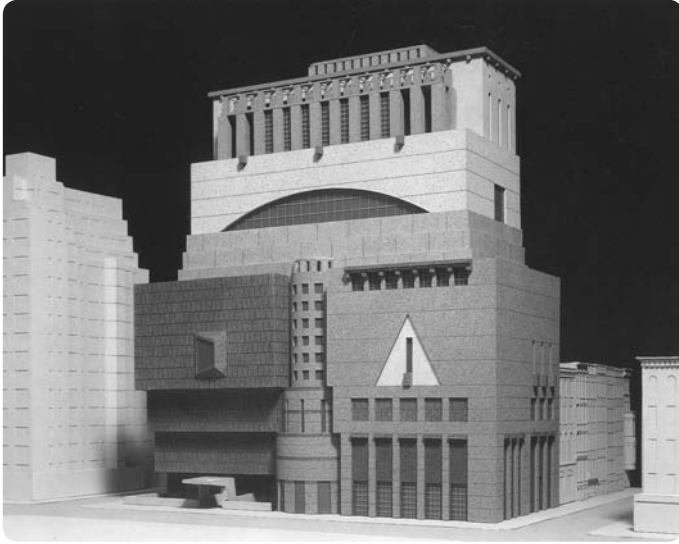
Figure 2.2: The Whitney projectogram: Graves' project, 1981–9 (© OMA)

Figure 2.3: The Whitney projectogram: Koolhaas' project, 2001–4 (© OMA)

It is uncommon to see images of a series of subsequent projects for modifying, extending, and amending an existing building, especially if the projects are separated in time. The sequence of images presented in Figures 2.1, 2.2 and 2.3 showcases different architectural interpretations of the same building and makes the differences between the projects discernible. Put visually together, the successive versions of the design proposals for the Whitney extension (version n, version n+1, version n+2, and so on) all become parts of a longer social biography of that object covering a period of forty years. We see only models, except in the first instance, which is a picture of the Breuer building. 'There are buildings, which can come close to reality in the model, but with this building I felt all the time that it lived only in my imagination. Now I am pleased that it confirms my imagination', stated Marcel Breuer in an interview in 1966 after the completion of the Whitney. If it was so difficult for Breuer to imagine the new building with all its details, as he stated, the other architects of the Whitney – Graves and Koolhaas – not only believed that the Whitney extension could be *seen* in a model, but devoted a substantial part of the design process to model making and the preparation of panels for client and users.

Although none of the design schemes of Koolhaas was made public, museum workers, artists, members of the Board of Trustees studied the extension for months in the form of models and plans, giving critiques, adding up new concerns and making demands. Members of the City Planning Commission, the Zoning and the Landmarks engaged in evaluation procedures, imposing still further requirements on the architectural process. During the design period, a lot of plans, architectural drawings, maps, models, renderings and collages were produced; they circulated in the office, and travelled many times to Ove Arup in London to meet mechanical and structural engineers; to California to be evaluated and cost-estimated by value engineers from the company DCI; and to New York to be discussed and assessed by the museum Board of Trustees. Packed in big boxes, stamped and insured, the Whitney models crossed many national frontiers. They have been present simultaneously in numerous offices, have been laid out on so many tables of models, and have been judged, disagreed over and esteemed by many different people. That is how a not-yet-constructed building, a project, gained a degree of reality. I entered Koolhaas' offices at

a moment when the first Whitney models had already been designed and were ready to travel around the world to meet the client and to win over potential users. The Whitney project 'lived' at the OMA in Rotterdam for three years. Architects, engineers and cost evaluators worked on the two schemes and believed in the realization of both. Numerous journalists were impatient 'to break the story', but none of them finally managed it. Various proto-users came to the office to catch a glimpse of the project and to evaluate it.[16] Crossing the threshold of the office of one of Whitney's last architects, following its models, diagrams and drawings during the design process, offered also particular entry points to the history of its architecture, which played an active role in the design of the new Whitney extension. The latter emerged as a puzzling design object in an active dialogue between past and design present.

As astonishing as it might seem, a projectogram (as seen across Figures 2.1, 2.2 and 2.3), covering a building forty years trajectory, had rarely been seen in public or in architectural presentations, since viewers are used to consuming images of built reality or representations of *the*-project-to-be-built. Commonly, rejected projects disappear quickly and are soon completely forgotten; few of them live a 'social life' of their own and are displayed in exhibits or published in books as witnesses to architectural creativity, thus entering the salient archives of the history of architecture. Theorists of architecture have tended to focus on successful projects, constructed buildings and master plans. Studies of architectural controversies over design proposals are either scarce or missing altogether, and little has been done to account for the role played by the numerous rejected projects,

16   Elsewhere I have developed the notion of proto-users to describe a group of actors that witnesses the coming into being of an artwork and actively participate in its shaping and reshaping (see Yaneva, 2001, 2003). Here, I will use it in a similar way – to describe the variety of actors that experience and perceive a building before it is finally defined focusing on the particular movement of group-formation around a non-stabilized design object. I will also analyze the role of the potential users in shaping design and bringing 'dirty realism' into design reflection (see Hill, 1999).

unsuccessful architectural proposals and urban initiatives, or their impact at the time when they were publicly discussed.[17]

Drawing on numerous examples of unsuccessful projects, anthropologists of technology have studied technological innovation (Bijker, 1995; Latour, 1996) and design historians have tackled everyday objects' diversity and evolution in terms of failure and success (Norman, 1990; Petroski, 1994, 1996). These studies state that successful and failed projects are to be treated in the same way: whether they turn into utopian dreams or objects they all have a similar way of coming into being. After many disputes and battles, much zeal and fury, these projects do not remain simply ideas; they assemble numerous humans and non-humans and mobilize them to act together to try and make the project a success.[18] Projects shape their own context (instead of being mere projections of it) and create their own networks by recruiting new crowds of allies, and employing a diverse repertoire of strategies of conviction, thus gaining degrees of reality that sometimes compete with the successful ones.

This is how the Whitney's architectural projects have behaved over the last four decades, enrolling more and more protagonists, generating

17   Architectural controversies and urban conflicts are often thematized in the academic literature as related to the city development and redevelopment, to issues of urban conservation and citizen participation in city planning (see Appleyard, 1979; Parfect and Power, 1997). They rarely tackle the design and construction of buildings. An exception is the recent study of the controversies surrounding the Sydney Opera House roof designed by the Danish architect Jørn Utzon, and the engineering and financial problems related to its realization, as well as to the challenges of the architect-engineer collaboration (see Murray, 2004). Yet, controversies over building proposals are discussed primarily in the architectural press and are mainly appraised as aesthetic battles of styles (see Johnson, 1994).

18   The term 'non-human' is used by Bruno Latour to replace 'object' as well as to widen its scope. It is a 'concept that has meaning only in the difference between the pair 'human - non-human' and the subject-object dichotomy (and) is not a way to 'overcome' the subject-object distinction, but a way to bypass it entirely' (see Latour, 1999, p. 308). His view is that non-humans have active role that is often forgotten or denied in philosophy and science. He employs these two terms to avoid the restricted roles for subjects and objects that suggest that objects are passive things for human subjects to use (see Latour, 1999, p. 303).

startling public effects, mobilizing communities of architects, neighbours, museum professionals and New Yorkers. To explain what went wrong with the Whitney building and its (always) impossible extensions, one cannot just concentrate on their designs (whatever their quality), as has been done traditionally (Byard, 1998; Newhouse, 1998). Nor is it sufficient to refer to the design philosophy of the first Whitney architect Breuer (Breuer and Blake, 1956; Breuer and Papachristou, 1970; Hyman and Breuer, 2001) and the architectural language of Graves (Norberg-Schulz, 1990). Instead, one needs to take into account the complexity of the situation of its design (and redesign), thus making design inseparable from the effects it produces and the actions it triggers.[19] One needs to *fully* account for the series of situations in which the extensions were designed: the actors, their trajectories and positions, the different Whitney statements, the various effects they produced and how they went wrong.[20] Hence, I do not intend to provide an answer as to why the Whitney extension has not been realized after decades of architectural controversies, nor why so many extension plans happened to be dismissed. Accounting the design process in the office of Koolhaas, this book tackles architectural projects as offering an experimental situation in which both the definitions of buildings and the social are challenged.

A possible way of interpreting the succession of failed projects for the Whitney extension would be to recall a variety of external factors (social, economical, political) as a source of explanation for the controversies

19 In a broader interpretation that would link architecture with aesthetic theory, design effects and consequences are related to the capacity of architecture of being expressive of a range of human states and qualities, to buildings as illuminating a range of architecture meanings, and to the notion of 'architectural experience' that has been important in the development of modern architecture (see Hill, 1999). By design effects I mean the capacity of architectural projects and buildings to provoke and to influence, rather than their expressive aspects and significant meaning. For the architects from OMA, the effects that design visuals, and especially scale models, can trigger are essential for the success of the design project. This is discussed in Chapter Four using insights gleaned from the interviews.

20 By *actors* I mean all participants, not only humans, but also non-humans (see Latour, 1993), which take part in the design venture.

surrounding the building extensions, the positions of the actors and the final dismissal of a design solution. Commonly, architectural theory either takes society as a source of explaining architecture, or examines architecture as a mechanism for exercising control and shaping the social. In the first case, buildings are given the status of submissive mirroring surfaces of societal changes, economic factors and the broader macrocosmic organization (King, 1980; Watkin, 1980). To be understood they should be placed *into* social contexts (Bourdieu, 1971; Ball, 1983; King, 1984) and tackled against larger socio-economic environments, economic, political cultural and demographic frameworks. In the second case buildings are interpreted as vigorous instruments in the hands of the social having the power to shape and even transform society (Markus, 1993), and to affect people's behaviour and social practices (Evans, 1982). Here, architecture is seen as an important tool for exercising invisible control, expressing, giving room for, sustaining, denying or producing bonds. It also has a conceptual weight upon the production, transformation and transmission of knowledge. Yet, by either neutralizing or instrumentalizing architecture, architectural theory fails to reveal its specificity and actual dynamics, its modes of action.

In this book I will argue against the widely accepted view that architecture is a projection of or in service of society, conditioned by or conditioning a variety of social contexts and practices. Following the proactive power of architectural projects to mobilize heterogeneous actors, convincing, persuading or deterring them, buildings will be tackled here as *becoming social* (instead of hiding behind or serving the social), as active participants in society, design – as a process of recollecting, reinterpreting and 'reassembling the social'.[21]

In addition, since the object that will be designed and redesigned many times as the book's narrative develops is a museum, the story of the Whitney projects will allow us to witness the changing role of museums in public life during three different periods of time. As the abundant literature on

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21   I refer here to Bruno Latour's understanding of the social not as a separate domain
       or context in which architecture could be framed, but as what is glued together by
       many *other* types of connectors (see Latour, 2005).

museums shows, museums have been particularly controversial in the last few decades: evaluated in terms of architecture, programmatic concerns and new techniques of display (Stephens et al., 1986; Davis, 1990; Darragh and Snyder, 1993), they have provoked many debates and attracted much public attention. The 1980s and 1990s witnessed an unprecedented architectural boom in museum extensions, and also saw the start of the Whitney controversies. Defined by Jean Lacouture as 'muséofolie', this boom also aroused different opinions as to the function, content and cultural equipment of museums: is the museum meant to serve conservation and presentation only, or should it also accommodate study, retail and other leisure activities? What kind of architecture is suitable for a museum: a building that forms a shelter, a hangar, and serves as a container for numerous pieces of art and artefacts, or a building that is a monument by itself, an architectural gesture, a sculpture?[22] Do artists want strong museum edifices that by the merits of their architecture will imply difficulties of reading and decoding buildings' fabric from outside or neutral boxes that will not compete with art?[23]

Drawing on this tendency to analyze the museum either as a multifunctional neutral box or as a monumental form, numerous typologies have been developed (Montaner and Oliveras, 1986; Hudson, 1987; Montaner, 1990, 2003; Newhouse, 1998; Schubert, 2000). Yet, buildings are still interpreted and evaluated by critics and theorists according to a stylist alphabet (modernist, classical elements), or in terms of scale (fitting, not fitting, overwhelming) or function (Attoe, 1978; Colquhoun, 1981). That is, according to a language that is genuinely artistic and uses standards and rigid classifications, a language that relies on strong symbolism, not on speech acts (Austin, 1975). Thus, buildings or architects are labelled in the architectural press 'controversial' when they cannot be classified in the formal terms of a given architectural style or functional vocabulary,

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22   On questions of museum space and museum architecture see O'Doherty, 1986; Giebelhausen, 2003; Macleod, 2005.

23   On museum architecture as related to the artists' requirements, preferences and taste see Searing et al., 1982; Mack and Szeemann, 1999.

and the critics have difficulty understanding them. As a result, the public is less informed and less prepared to understand and interpret architecture.[24] The Whitney case allows me to question how the museum, artistic display, American art and public debate changed their definitions during the extension trials they were subsequently involved in. The manner in which the actors talked about the Whitney museum and the way they were prepared to judge architecture changed as well. In addition, *how* architects prepared the proto-users, clients and public to evaluate their design and to talk about a building consequently varied over time and according to the specific settings.

Writing Style

Like many books on architecture, this volume includes pictures documenting architecture in the making. Moreover, I invite readers to use them as puzzling visual objects that are to be 'read' in the same way architects and the public read plans, diagrams and sketches in order to comprehend a building. That is, most of the pictures are supposed to pose a question or make a statement (although few of them are used simply as illustrations of arguments). Others are especially designed to appear like architectural panels – not alone, but as sequences of images (like Figures 2.1, 2.2 and 2.3), so as to account for the little chronological or circular rhythms in design, reiterative operations or minute tentative gestures. The variety of images will also help us avoid what architects consider shocking for those who are not used to looking at architectural images; they need many of these pictures to normalize the 'disturbing presence of an emerging new shape'.

    Each chapter begins with a key image, which introduces the main argument, and is then developed throughout the narrative. This first image has

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24   Martin Filler explains why there have been so many controversies in American architecture since 1970 (see Marder et al., 1985).

no textual explanation, and this instates a puzzling uncertainty about the nature of the things presented on it; it is to be deciphered and articulated later in the chapter with the help of numerous other visuals and of text. Hence, the use of visuals will follow the logic of design: it will correspond to the complexity of the issues to be solved. As the chapters' narrative progresses and the story is enriched by many new details and actors, this complexity increases greatly, and the building becomes more defined as more composite visuals are produced (in the textual bodies of the chapters). The conclusion embraces a diagrammatic rhetoric comparable to the diagrams in this architectural office. That is, the dynamics of the book's narrative mimics the overall conceptual logic of the design process as seen by me at OMA. Therefore, the book's structure is reminiscent of the logics of the design process: as a project becomes more developed and more information is gained about the building, its diagram becomes simultaneously more 'condensed', argue architects from OMA. Just as the numerous architectural models and presentational books of the Whitney project are tools for 'obtaining' more data and 'presenting' the collected knowledge, the narrative form of this book serves as a tool for recalling and presenting the Whitney's history and design actuality as seen in the practices of architects at OMA. Instead of progressing in a linear fashion from a state of zero information to a completely known and defined object, the new building appears in the architectural office in two presentational states; it always exists as a little-known, abstract and fuzzy entity, and at the same time a well-known, concrete, and precise object, as a bunch of elaborated models and a schematic diagram (Yaneva, 2005b). That is also how the Whitney is meant to emerge in this book. On the one hand, some aspects of the design venture could remain vague and cannot be accounted for with precision: why the design scheme failed, how exactly the proposals are assessed and judged to be unsuccessful, in what circumstances these design proposals were evaluated; on the other hand, important moments in design venture will be recalled and analyzed in much greater detail. As I will mainly be discussing projects, the narrative sometimes colludes in reproducing the conditions of projectness as an appropriate narrative form, but most often will maintain in the performativity of writing the conditions of design experimentation.

Since, as architects at work argue, 'it's so impossible to show a building in a simple way, because there are so many parts, so many existing things',[25] the book takes account of the complex intricacy of layers, statements and interpretations in the Whitney story. Moreover, each reader will look at models and diagrams in a different way, just as each person looking at a building responds differently: 'There is so much information on these diagrams, because there are so many people looking at them, so many different groups of people: artists, curators, clients, money raisers – each of them has a different *concern*. Each one of them wants to see different information, and is looking for different information at the same time.'[26]

Likewise, the book will provide different groups of readers, each with a different concern in mind, with a variety of information and will constantly update the interpretations of the building as the chapters pile up, in the same way that models, drawings and diagrams are gradually upgraded through design experiments with the newest data obtained and are installed on the table of models. '*We don't show the same to everyone*, because, the mayor probably is not interested in the mechanical aspects of the building or the square footage,' says the architect Erez. What I attempt to do is to show a variety of vantage points so as to enable everyone – the mayor, the mechanical engineers, and fans of the Whitney – to obtain their own reading as they go through the chapters, and to compose through the succession of interpretations and visual panels an *additive* story which will be simultaneously a story about how the social is made architecturally.

25   Interview with Erez, November 2001.
26   Interview with Sarah, November 2001.

To Follow Architects at Work

A great majority of studies offer analyses on the final products of architectural design – buildings, master plans, landscapes, and interiors. Commonly, when it comes to tackling the process instead of the products, some generic characteristics of architectural conception and design principles are outlined (Rowe, 1987; Schirmbeck, 1987; Shoshkes, 1989; Conan et al., 1990), or designers are asked to describe what they do so as to make the reader hear the voices of famous architects through interviews, and outline profiles of practitioners and patterns of architectural discourses (Lawson, 1994). These studies aim to discover some general rules on 'how designers think' and 'what comes first in design practices' in order to build up a classification of distinctive design approaches and outline the guiding principles in design work. One of the main concerns of architectural theory remains to show how the idea 'comes' to the designer and what triggers design reflection and enacts practices (Alexander, 1964, 1971; Grillo, 1975; Darke, 1979; Lebahar, 1986; Boudon, 1995; Mitchell, 1996). Only a few studies have looked closely at particular cases and have striven to analyze the logic of design and how architects reflect-in-action (Schön, 1983, 1987), or how design problems are construed and resolved, and how clients and architects negotiate (Cuff, 1991).[27]

Instead of seeking to establish a typology of ways of designing, based on after-the-fact analysis of architects' accounts (interviews, autobiographies), I followed architects at work in the OMA during the period 2001–3 in order to describe ethnographically the design process. I studied the way designing architects transformed materials and instruments and tackled the history of Whitney, so as to describe the design rhythms with their little

27   The majority of authors have conceptualized the design process by looking at design reasoning about the client, the final product, and the community (see Hubbard, 1995) or the mediating role of the architectural press, journalists and critics in design (see Devillard, 2000). They examined the variety of actors and contractors taking part in architectural design, and the mechanisms of the decision-delivery process (see Orr, 1985) or the role of research in design practices (see Laaksonen et al., 2001).

procedures and repetitive movements, and the specific effects that models, drawings, plans and other visuals exercise upon their producers. The reader is invited to enter the office of Rem Koolhaas and to follow the work of the Whitney team as it conceives and designs the museum extension. My aim is not to present the habits of the office and the general rules of their design philosophy (Lucan et al., 1991; Oswalt and Hollwich, 2001), but to make the reader hear the architects' voices, to follow the reactions and discussions of architects, engineers, stage designers, cost evaluators, curators and artists, to see them draw, build models, negotiate the costs of a building, and design the NEWhitney. By following design operations and discussion, one can 'see' and comprehend what designers do when they conceive a building, how a building is defined and presented to a variety of actors, who gather around its models and partake in its making and remaking.

To report on the design process with greater meticulousness I apply Actor-Network-Theory (ANT) to the field of architectural design. This method has been primarily used to tackle scientific and medical practices (Latour and Woolgar, 1979; Lynch 1985; Knorr-Cetina, 1999), technological innovation (Latour, 1996), and was later applied to engineering design (Law, 1987, 2002; Vinck, 2003) and even contemporary art (Yaneva, 2001).[28] By translating literally the Greek word 'epistemology', *science studies* suggested that the knowledge about a central and insolvable problem could be gained by knowing the local and empirically traceable ones, following and accounting the networks of activities. The ANT presumes that there is a basic uncertainty regarding the very nature of action, groups, objects and facts, to the extent that in order to produce an 'explanation of …' the researcher cannot rely on mobilizing pre-established definitions (Law and Hassard, 1999; Latour, 2005). Its methodology requires, instead, the following of the actors in their routine practices and the watchful accounting

28   I have applied a similar ANT-inspired perspective to the field of arts in a previous study on museum installations in *Musée d'art moderne de la ville de Paris*. Instead of looking at the artistic installations and witnessing what artists say about their artworks after-the-fact in order to establish what kind of processes generated their artistic products, I watched artists, technicians and curators *in action* as a more direct way of establishing the nature of the artistic process.

of their actions and transactions in complex spatial settings, the materialization of the successive operations they perform on a daily basis and the foreseen and unforeseen consequential effects they trigger. In such a thorough ethnographical survey of practitioners at work the researcher can gain access to the actors' own definitions of the social, of the way they are given identity as a group, of the variety of agents that partake in their actions. Applying this method, I devoted days and nights to the exhaustive exercise of 'following the actors' – in this particular case, the architects, who turned out to be a tribe with a painstakingly graspable rhythm. I saw how they agree and disagree, how they form various groupings within the office, how they attribute meaning to their actions, engage in the repetitive rituals of team discussions and public presentations. To trace the design process, I followed simultaneously the actors' discourses and the non-discursive actions (movements, grasps, gestures, and reactions to me as an observer), which also produced information about design and emerged along with the discursive acts. I listened to their 'native' definitions of how a good model of Whitney should look like, of what it means to think architecturally, of how one learns from a model, of what a design public is, of what it means to design.

Following the ANT as a method of STS would not mean to identify, recognize and study the scientific or technological knowledge, devices and networks situated within, co-existing with, or criss-crossing the architectural ones. The task rather consists in studying the particular ways and actions, individual moves and collective groupings, through which architects, engineers, clients and proto-users shape buildings, gain design knowledge and produce design artefacts. Thus, architects are studied not because they are important with their theories, but because they make possible the existence of numerous objects and networks that constitute architecture. That is, a pragmatist approach to architecture, not a critical one will be advocated here. A critical approach would attempt to situate the particular Whitney case or the OMA design approach into more inclusive types of readings, which will address issues such as Koolhaas's background and theory, as well as the specific social and political contexts of the Whitney extensions in three periods of time. This means to mobilize and evoke ideas from *outside* architecture to interpret design and reveal a myriad of hidden

meanings and mechanisms of architectural practices (Leach, 1997; Hays, 1998; Borden and Rendell, 2000). Instead of referring to the philosophical premises of Koolhaas's work, I will describe designers at work at OMA as I *see* them, not through the lens of any particular theory *of* Koolhaas or *about* Koolhaas, or any other kind of theoretical context that can bias my account of designers' practices. That is the reason why I also do not discuss other projects of OMA.[29]

This method to study architectural practices differs considerably from the problem-analysis-solution approach, which consists of analyzing design tasks by proposing logical structures and processes that should take place to resolve problems (Boyd, 1965; Simon, 1969; Lebahar, 1986) and by doing so create new ones (Brawne, 1992), or to establish algorithms and rules, by relying on order and predictability in the design process (Jones, 1970; Grant et al., 1982; Heath, 1984). Instead of seeking to establish rules, I examine meticulously the transmutations that occur between models and building – a problem that remains to a large extent an enigma in architectural studies (Evans, 1989, 1997). Translation, transfiguration, transformation, transfer – each of these terms refers also to the multiple procedures through which a building is brought into existence. They sit happily in the blind spot between architectural drawings, models and diagrams and their object – the building, generated through numerous techniques of projection and translation from model to building (Blau and Kaufman, 1989).

To understand how the Whitney is defined and becomes known I use both archival work and the ethnography of architecture. Thus, my sources on architectural design are conversations among architects engaged in the project for the extension of the Whitney Museum of American Art in New York; in-depth interviews with architects, mechanical engineers, cost evaluators, and proto-users; observation of office practice, team meetings

29   I have deliberately chosen not to discuss Koolhaas's early works and his theoretical and philosophical thinking in spite of the fact that architects from OMA are heavily influenced by Rem's theoretical thinking and writing (books like *Delirious New York* and *Small, Medium, Large, Extra-Large* are read many times by the young architects in the office and are used as practical guides to design) as this can bias my description of the design process at OMA.

and presentations, rites and working habits; and a rather dilettantish personal participation in model-making. My sources on the architectural controversies surrounding the Whitney's extensions in the 1980s and the controversies surrounding the Whitney's construction in the 1960s include press clippings from those periods, the Whitney archives (which I consulted in the Whitney library in New York), as well as some OMA archives (to which I had been given access over the period of participant observation in the office).

In the office ...

On my first day at OMA, I discussed my project with Rem Koolhaas, and he said: '*Tu veux être la 'femme invisible' à OMA*? How would you like to observe us? Would you need a room full of cameras to do so?'[30] I was embarrassed, because he tried to translate immediately my intention to do an observation of their everyday practices and discussions into architectural terms. He tried to 'architecture' my presence in OMA. Of course it was a joke, a Foucauldian one for me, because I imagined, just for a second, the panoptical horror of sitting in an office full of monitors overseeing the architectural practices. I just wanted to be able to see the minutiae of their day-to-day activities. I wanted to watch them draw and handle the models, to see them smoke and discuss things on the terrace, to listen to their jokes in the kitchen, to feel the pressure in the air when the tall silhouette of Rem appeared in the office; to see all these tiny fragments from the daily routine, and to be part of it. This, I thought, is how an architect imagines my involvement in OMA: by imaging a specific space for an ethnographer to conduct specific observational practices.

Another small fragment from a discussion points also to the specific status of the 'place' in the unstructured environment of the architecture office. Rem presented me to Ole, my contact person in OMA, a young architect who had worked with him since 1995, and who is actually one of the partners in OMA. At the end of my first visit, I was looking for

30   Interview with Rem, February 2002.

Ole to say 'goodbye', and I asked Rem: 'Where is Ole's office?' Puzzled by the question, he answered: 'It is not a question of offices here.' Then he went out in the corridor and shouted: 'O-L-E EEEEE!!!' Ole appeared immediately in the corridor. I guess I understood then the joke about the '*femme invisible*'. They are all invisible, moving through the office without having determined spaces. Rem and the administration staff are probably the only ones who have offices and defined spaces, and objects belonging only to their offices. In the rest of the studio, objects and architects, foam cutters, sketches and maps, move together and change their positions in relation to each other according to the dynamics of the ongoing architectural projects. If it is 'not a question of offices', then what is the smallest spatial unit in the studio, and how is it related to the architects' practices? Soon, I understood that it is a question of 'bubbles'; in the huge one-room office there are no strict spatial divisions between the working places of architects and teams, no rigorous distinctions between cutting instruments and computers. Although the different project zones and equipment overlap in the flat horizontality of space, the project teams exist as 'bubbles', with little exchange between them and little knowledge of each other. At the moment I started my observation, the office managers wanted to bring in a new type of *horizontality*: as Ole put it in the very first interview, 'all projects will be basically at the same level, at the same knowledge to each other, at the same level of transparency for everybody in the office.'[31] It would therefore be possible for the chief architects to support every project and intervene where necessary. At the end of the day Rem introduced me to the designer Petra Blais:

> REM: This is Albena, she is a sociologist, observing the process [very flattered]. *Did you find a place?* [very kind]
> ME: Yes, I'm sitting next to Carol, on the Whitney table.
> REM: It is a very chaotic process, isn't it? [very happy with his question]
> ME: [I am embarrassed, because I don't know how to answer] Aaaa, it is dynamic!
> [Rem is not so satisfied with the answer; the word 'chaotic' is the one he expected to hear.[32]]

31   Interview with Ole, February 2002.
32   Discussion from 19 February 2002.

What does the expression 'to take/find place' mean in this shapeless and messy environment? And why does Rem keep asking me the same question? In this office environment, working 'places' are designed more as entries into a network than as separate isolated spots. Every architect can sit at any computer in the office and work on the project he is involved in, since the basic data are loaded on every terminal. Having access to the same information bank of images and technical specifications on the projects, architects work on computers that are connected in a dynamic network of interchangeable points. Only a 'login' name and password for each project is needed to enable access to the data from any operating station. Working together, they conduct different types of visual work using the same data, but cannot modify the same image simultaneously and are unable to witness the changes that are being performed at the same time by another architect on the adjacent computer. Like surgeons operating on different parts of the same complex body, they rely on the same basic information, and can learn about the results of the manipulations that are performed in other parts of the network only when the whole 'operation' is completed.

When you observe architects at work, you see that there is not merely one time and space: they rely on subversion, disjunction, displacement and rescaling. In their activities architects are constantly modifying the scales and the relations between actors in space. I came to understand that to find a place in OMA means not to take a seat or to find a small location in the expanded spatial structure of the office, and to designate it as 'mine'. Instead it means to find the specific tool for intensifying one's presence in the space. The question regarding how to take a place in a placeless space appeared absurd to me at the beginning, because I associated it with horizontality. It is however a question of the intensity of time as opposed to its expansion. Architects have places in this studio only because they never stay in the same place: they perform many movements between floors with a bit of a model in their hands, and circulate frantically back and forth on

the same floor.[33] It is only because they come back to the same location over and over again that a notion of 'place' can be generated as something that stays the same while they move. Only through repetitions of these displacements can the actors (including myself as observer) be put into space. Repetitions are related to the intensity of time. What makes us encounter a *topos* in this chaotic office is the connection of actions taking place at various sites and times by different actors. I was also constantly moving in the office, and I was looking for a place – that is, for my way to encounter the multiplicity of those actors' interactions which were relevant to my study. Thus, by asking me to find a place, Rem suggested that I *intervene* in the process, and interact with others. He even told me during a discussion later in the year that I was very discrete, meaning that he wanted me to be part of the process, but at the same time he did not want to be a passive object of observation; he intended to co-operate in the research during the following months.

Ways of Watching

To capture this rhythm and intensify my presence in the process, I positioned myself in different ways so as to find a suitable stance to observe the actors and interact with them. First, I had to elaborate a specific *technique of observation*, which would allow me to stay close to the Whitney team and follow its members throughout the office. When there is a particularly topical discussion, a controversial moment or an agitated talk among the

33   Following design theories, I assume that discontinuity and versatility are the main features of architectural design (see Schatz and Fiszer, 1999). It relies on surges, breaks, sudden 'jumps' and meticulous inspections, repetitions and returns; it sets into play simultaneously different sized actors and several scales, many of which persist throughout all the stages of the project, regardless of their precision. Recent studies on engineering design also treated design venture as a messy nonlinear process, full of unforeseen pitfalls and unpredicted actions (see Henderson, 1999); a maze, or complex multidimensional web of interconnections, moving toward a final well-designed product (see Bucciarelli, 1994).

architects, I keep my distance and try to disappear from the 'battlefield'. I stop taking notes and pictures. For them, that is a sign that I am completely disinterested in what is happening, and they can go ahead with what they are doing, ignoring completely the presence of the observer. I try to memorize every single detail and then, disappearing onto the terrace or into the kitchen, I plunge into my notebook, trying to inscribe carefully all traces of the discussions I have witnessed just moments ago. In doing so, I was trying to maintain a regime of presence that, although temporary, had to be prudent, imperceptible and not aggressive *vis-à-vis* the actors observed.

The very first days in the office were significant for my identity as an observer. Rem introduced me to the PR person, guided me around the office and gave me access to all the press clippings. Hence, at the beginning, the architects simply did not notice a new type of presence, believing that I was one of those very frequent visitors to the office, who stayed for a couple of days reading the press clippings and conducting interviews with Rem, and then disappeared promising to send their articles as soon as they were published. Accustomed as they were to the constant influx of newcomers, to the many different languages spoken around the tables of models, and the sometimes anonymous communication among architects in the office, another hypothesis was that I was a new apprentice, especially as I was young, a foreigner and melted easily into the activities of the Whitney team. The huge volumes of clippings allowed me to build a paper shelter for myself, and that was my second *technique of observation*: I plunged into them for hours, trying to learn more and more about the office projects, architects, ongoing competitions, public reactions and controversies; the gloomy comfort of the press clipping volumes allowed me also to hide my embarrassment at the beginning, to escape the many curious glances cast by the architects passing by my quiet niche of reading-and-watching, and to contribute to the hubbub of office activities. Very soon the reading of press clippings was replaced by the careful study of the in-house archives

on the Whitney project: architectural books on Breuer and Graves, e-mail exchanges with the client, the collection of articles on the Whitney case and the documentation on the controversies surrounding its extension projects in the 1980s, papers on the NEWhitney project, OMA publications.[34]

Most of the architects work in this office for a couple of years and then either go back to school or decide to develop their own office practice. They gain knowledge in the process of design through (1) the numerous books by Rem, which are a source of inspiration, a dictionary of the architectural philosophy of the office, and a tool kit of problem-solving mechanisms mobilized in their work on a daily basis, and (2) modelling, scaling, drawing and actively engaging with materials and shapes, as well as with the other architects in the project 'bubble' and in the office. I followed architects in the process of making design visuals and in many other situations in which they learned from each other, from the master architect and from other participants in the design, from the foam matter and the cutting instruments, and from the models. Like the architects, I also learned from the books by Rem and the books on the shelves of the Whitney team, and by following the diverse design operations and partaking in them.

Thus, from the very beginning I was not a 'stranger' in the office, as the anthropologist appears to be in many settings. Instead, I was given the convenient label of 'visitor-journalist' (often present in the OMA) for the beginning of the study. After a week of observation and reading of the OMA press clippings and documents, architects detected some differences – I was coming back to the office very often and was spending quite a lot of time with them, following them everywhere from the model shop to the office presentations; instead of being interested in talking with the chief architect only, I engaged in participant observation of the activities of the Whitney 'bubble' and conducted interviews with young architects

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34   The main books that served architects as a guide to design practices were *Small, Medium, Large, Extra-large* (Koolhaas et al, 1995) and later *Content* (OMA and Koolhaas, 2004). They analyzed different scale-projects at OMA, investigating how they are proportionally applied to different-sized cities and urban spaces, as well as how they generate multiple content. The same books served me as a valuable guide to the Koolhaas office practice.

as well, following discretely their activities and asking about the development of their projects. I always carried a little notebook and a camera so as to inscribe every tiny trace of observation and take a picture of everything I found interesting and relevant to my study.

A glass-walled office space next to Rem's office, predominantly used by Ole, served as a meeting point for my interviews with many of the architects, and as a comfortable niche from which to observe the architects' reactions to my ongoing study. There, I was inviting the architects from the working 'bubbles' to interrupt their activities and share confidential discussions in the presence of a tape recorder. Thus, I was labelled 'the sociologist working on the Whitney'. Whenever I invited a non-Whitney architect for an interview, he or she immediately objected, 'but I don't work on the Whitney right now'. Soon we started talking about many other projects, and they noticed that the discussions revolved around the OMA ways of designing instead of focusing solely on the Whitney project. The transparent separations of the little office allowed these interview sessions to be visible to many of the other architects in the office, working in the adjacent 'bubbles', who very soon felt that something unusual was happening in the office – a visitor-for-more-than-a-couple-of-days was spending weeks with them, and they did not know what this kind of long-term presence meant. Involved in many projects at the same time, young architects were not used to special attention; at the end of an interview session Sarah told me: 'no one has ever asked me such questions before.'[35] Amazed by both the attention and the meticulous regard for their work, they were generous and helpful, devoting many hours to my questions and forgiving my sometimes bothersome presence (especially in the team discussions).

The different reactions of the observed architects to my presence in the office had the side effect of rendering me even more visible as an observer. This visibility was considered an important tool for regulating the distance between observer and observed. The various tools of observation permitted me to stay at two different distances: close to the actors and the course of their actions, intervening and participating in little tasks;

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35   Interview with Sarah, February 2002.

and at a greater distance so as to be able to translate and inscribe traces of actions and speech acts.[36]

It was difficult to record the group discussions in the office. I was using only my notes and my camera, trying to retain as much as possible so that I could later write it up carefully in my notebook. Architects and objects moved at such great speed that it was not possible to follow them simultaneously in their complex interweaving trajectories. I was spending my days running after architects and models, taking notes and drawing diagrams of their movements, trying to understand their hectic displacements in the space that stretched all over the seventh floor surface – a flat space shaped and reshaped by the internal office activities. Although I was spending the evening transcribing interviews, and preparing questions, the following day was always full of surprises and I was never sufficiently prepared. This routine of interviews and observations followed by transcription was loading my fieldwork weeks in such an intensive way that I was literally living in the office. The fieldwork survey lasted two years (the most intensive work was done during 2001 and 2002, with less frequent fieldwork visits in 2003). During this time I was travelling between Rotterdam and Berlin (where I was then living); all my visits to Rotterdam were timed according to the activities in the office, and especially the key moments in the Whitney project.

The protagonists of my story were always quicker than me, always more prepared to react even to unexpected questions, and always spent more time working overnight, so that I was always discovering a newly-developed diagram and model when I came into the office each morning

36   Commenting on the different stances of the observer in anthropological investigation, some anthropologists, such as Malinowski, advocated a way of research that almost effaces the distance between the observer and the observed, and argued for empathic fieldwork, for observers immersing themselves in the practices of the tribe, and for participation as being an important part of observation (see Malinowksi, 1967). In contrast, Geertz (1988) believed the position of the observer in anthropological investigation possessed more layers of complexity: instead of 'plunging into the lives of the natives' and letting himself be converted to one of them, the anthropologist should learn to maintain a multiple existence.

following an evening transcribing interviews. Recording the interviews that were conducted in the glass-walled office was important not only for me, but also for the architects – documenting their words and the various ways of explaining architecture was an important means of crediting their work. For me, the 'apprentice' in architecture, it was also a way of learning specific architectural terms, of mastering the design vocabulary and trying to cope with the realities of the office in the same way they did. The rhythm of the office tamed me at the end to the extent that I became 'trained by the field'[37] and began, up to a certain point, to think and act *like* an architect.

37   I refer here to the expression of Knorr-Cetina (1999).

Designing Between Archives and Models

Figure 3: The NEWhitney model (photograph by the author)

A morning in the office. It is quiet and empty. Some lazy 'good mornings' come from a few enthusiastic young interns, and a pleasant aroma of coffee wafts in from the kitchen. Overcrowded with dirty cups and dishes left over from the previous working night, the kitchen's disorder mirrors the one in the office. Daylight breaks through the glass walls of the huge one-room space that opens the office to the city, and sparkles on the traces left from the previous evening's labours – drawings, models and panels share the office's morning silence.

These lazy mornings are so different from the intensive working evenings and nights, when, at the end of the ordinary working day (around six o'clock), computer music announces the beginning of 'the evening shift'. Architects start buzzing with excitement following the departure of all the administrative staff. They find themselves alone with specific design tasks to complete surrounded by the sounds of the same music they have listened to during the day in the privacy of their earphones. Now the music is given the opportunity to contribute to the office hubbub, and to amplify the excitement. The architects share a pizza around the table of models; the same table that hosts their discussions and the latest drawings during the day now serves as a restaurant table, decorated with scale models instead of flowers. Then the architects from the Whitney team scatter again around the office and the table of models remains untouched until morning; sometimes a new model arrives with the sunrise, more updated drawings are printed out and set up on the table just as the city of Rotterdam is about to wake up.

The morning trajectory of every member of the Whitney team takes them first via the kitchen, where dirty cups are cleaned and strong coffee is prepared, and second, past the table of models, where the 'fresh' images, most recent models and updated drawings and plans made overnight are shown. The table is the main meeting point of the team, where they all get together, cups of coffee in hands, to inspect the very latest changes to the Whitney design and the development of the project. It functions as an 'organizer' of the team activities. These early morning meetings have an important coordinating function – during the day architects constantly go back to this table to update drawings and check what has been done by other members of the team. They also gather to discuss and evaluate interim results, and invite architects from the other 'bubbles' to serve as the NEWhitney's first public.

A few tables away we can see Carol, the project manager of Whitney, sitting in the midst of numerous paper plans, models and folders scattered all around her computer (Figures 4.1 and 4.2). Every morning she arrives in a good mood, taking one of those strong OMA coffees that really wake you up even if you have only slept for a couple of hours. She takes a seat, always close to the team's computers, the table of models and

Figure 4.1: OMA Archives (photograph by the author)

Figure 4.2: Carol between archives and models (photograph by the author)

a bookcase, and begins work. What is the bookcase behind her used for?
How are the folders, books and documents packed on its shelves related
to Carol's work on the computer screen? How could they lead us to the
NEWhitney project?

Carol begins her day by responding to a fax that arrived last night
from the Whitney's director, then organizes a meeting with the museum's
Board of Trustees in New York and coordinates with Rem the strategy
for an upcoming project presentation. She shares the e-mail news on the
project with the first members of the Whitney team to arrive – Sarah and
Erez. They always arrive later since they usually stay late in the evening.
She uses two kinds of sources for her work. She either goes to the Whitney
files on the computer – an image database common to the members of the
team and accessible only to them with a password. Six keystrokes only and
she is in; she can look at the latest plans and send the most recent draw-
ings to the client. Or she can check the folders, carefully arranged on the
bookcase behind her. One can learn about the project's history literally by
looking at the arrangement of books and files on the bookcase (Figures 4.1
and 4.2). There, various sources evoking the Whitney museum's history are
collected: a recent biography written by Gertrude Vanderbilt Whitney's
granddaughter – Laura Miller, literature on museum extensions, com-
parisons with other museums' design projects, New York plans, structural
models of the proposed addition, folders entitled 'projects of Graves' and
'the Breuer Whitney', reports from the last visit of the engineering company
Ove Arup to the building site, etc. Discussing this particular arrangement
of documents on the bookshelves behind her, Carol argues:

> I wouldn't actually say that we looked at the history first and that it helped us develop
> the NEWitney project; it was more a case of developing something and as we were
> developing it, we thought, 'wait, we are not calling the zoning envelope;[1] for the

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1   The 'zoning envelope' is an imaginary, tent-like space inside of which the building
     may be placed in any location. The base of the zoning envelope is the ground area
     within which construction may occur (see Wood, 1984). The term 'zoning envelope'
     entered the vocabulary of urbanism with the New York's first zoning legislation of
     1916. Designed to limit and define the height and bulk of tall buildings in New York,

zoning envelope let's look at the Graves building, and this is what happened when he filled the zoning envelope and made it in a certain way.' We wanted to use the brownstones, but asked ourselves: 'What is the history of the Whitney?' 'When was it in the brownstones?' And the original idea strengthens that idea, so let's use that, and push that. And again, that was more supportive to what we were doing.[2]

The members of the Whitney team gather often round the bookshelves, browsing for a particular image or a document from the Whitney's history. All these materials have been collected in the research period of the design process, when the architects became acquainted with the Whitney for the first time. There is a particular movement that architects perform on a daily basis: from the table of models, through to their computers and drawing boards, to the bookshelves behind Carol; the ethnographical description of this movement, reiteratively occurring in the design activities of the team, could give us a clue to understanding the making of the NEWhitney. 'Back to the bookshelves' is for the architects the equivalent of going back to the Breuer architecture of the Whitney Museum, or back to the Graves proposals for its extension. 'Back to AutoCAD and the model shop' is for them the return to actuality.[3] In this trajectory the building's history is no

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the 'zoning envelope' also protects some measure of light and air in these buildings. It is considered as an important 'external force' in the shaping of New York high-rises (see Ward and Zunz, 1992). This design requirement, and the way various Whitney architects answered it, will be largely discussed further in the book.

2   Interview with Carol, April 2002.

3   AutoCAD is a computer aided design (CAD) software application for 2D and 3D design and drafting, which is widely used by architects. The first version of AutoCAD appeared in 1982 and since then it has become the US industry standard for the production of architectural graphics. Two-dimensional CAD applications are basically digital versions of hand drafting. Most of them have some three-dimensional capabilities, but they are predominantly used to construct standard orthographic projections: plans, sections and elevations. CAD applications have recreated the drafting table in digital space with some differences. The introduction of AutoCAD has triggered a substantial shift in architectural design education (see Brown, 2006) and its implementation has changed the status of architectural representation and the office culture (see Bruegmann, 1989; Lebahar, 1983). For an overview of the major issues on Computer Aided Architectural Design see McCullough et al., 1990.

longer a linear succession of periods of Modernism and Postmodernism, whose lessons and achievements are taken for granted, whose passive stocks of knowledge are freely available for generations, whose uninterrupted course is undisputable. It appears instead as a set of concrete design solutions developed *in situ*, as a practical tool for apprehending reality.

Evaluating the OMA proposal for 'NEWhitney', the Museum Board asked itself: 'What guarantees do we have that the Whitney can pull this project off given the fact that the Michael Graves plan was a fiasco? There are no guarantees. But we believe we have *learned from the past*. We will continue to move this project forward with caution and a great deal of consultation with artists, government officials and community decision makers.'[4] Like the museum, the architects learn about the building from its past and at the same time gained knowledge in the process of designing it. I will invite the reader to learn about the Whitney building by following the specific trajectory of architects in the office: moving between the table of models and the bookcases, to and fro, until a new folder is opened, filled and arranged next to the other ones, or until a new model is shaped and joins the others in the early-morning Rotterdam haze. So, in what follows, I will 'not look at the history first', to use Carol's words, in order to help us develop a story about the NEWithney project. I introduce the history of the Whitney as architects do in their design practices: *in the process* of developing an issue, *in the process* of drawing and modelling in order to extract new data about the Whitney.[5] This chapter follows architects from OMA *at the time* when the Whitney model (presented in Figure 3) and other visuals were made, staged on the table of models and largely discussed. The Whitney archives and press clippings from the 1960s and 1980s allow me to follow also some design moves of the other Whitney architects *at the time* when they were designing and modifying the Whitney. This is not, however, an extensive comparative analysis of the design

4   '75th Anniversary Campaign Case Statement', Draft of 18 September 2001, OMA Archives, p. 28.
5   I also learned a great deal about the Whitney museum in the process of writing and reading about it.

experimentations conducted in the offices of Breuer, Graves and Koolhaas. It is only supposed to introduce us into *the type of historical* enquiry every architect begins a project with. Starting from the drawing board and the table of models, OMA architects go back to history to find out (on the basis of press clippings, books, articles, image archives) how a particular design issue has been tackled in the 1960s and in the 1980s, and then return to the drawing board to integrate the results from this enquiry in their current design. Thus, instead of providing a historical backdrop meant to contextualize Koolhaas's projects for the Whitney extension, here I only aim at demonstrating how architects at work gain knowledge about the Whitney museum as a design object endowed with a complex trajectory, which they can only decipher *in the process* of designing its extension. By so doing I rely on a very selective rendering of the Whitney history, *the one* that architects from the office of Koolhaas gained access to, used in their interpretations and mobilized in the tentative design venture of extending the Whitney Museum.

Entering the office of Koolhaas to learn about the ongoing process of design, I am gradually led, together with the designing architects, to open design black boxes from the past and witness how architects open the black box of the Breuer Whitney and how they consider the different way in which Graves reopened the same black box of the original building twenty years before the project entered the Office for Metropolitan Architecture in Rotterdam. In their discussions on the drawing board and in the model shop, architects from OMA engage in a venture of *interpretation* of the meaning and the repertoire of actions of the existing buildings and the given conditions.[6] In order to gain access to them they study the history and thus find out what was susceptible to meaning at Breuer's time in the 1960s and in the architectural controversies surrounding Graves' proposals in the 1980s, what the building did and how it reacted to the attempts of architects and urban planners to modify it and extend it in a particular way, how various actors talked on behalf of the building, their statements and controversies, and how their voices came to be heard. Thus, instead

6   I am referring here to the notion of interpretation expounded by Tamen (2001).

of tracing a linear account of the Whitney's architecture from Bauhaus to Koolhaas, based on a comprehensive historical investigation, architects embark on a retrospective analysis of the past, engaging in a process of interpretation of the Whitney museum, its performance, its architecture and artistic display – that is, a process of retrospective attributing of meaning to the Breuer building and the brownstones, and then re-appraising them in the actual design making. In this exercise, architects from OMA believe that they are talking *for the building* and its manifestations in history and that they act as its best speakers. The Whitney appears in design venture as an *interpretable object*.

Let us begin the story from the Koolhaas office (with the help of the ethnography of design), and then follow the designers as they go back in history (with the help of the museum archives and press clippings from the Breuer and Graves periods) and perform a peculiar retrospective movement of reconnecting their design moves with the ones of the previous architects of the Whitney and carefully accounting the results of this design experimentation. Inspecting the NEWhitney model, presented in Figure 3, one can witness that the physical manifestation of the new extension, as stated also in the OMA presentation books, is derived from particular site conditions: an exceptionally small footprint, the zoning envelope which steps and slopes as it mediates between a commercial district on Madison and a residential district to the East, the maintained Breuer building and the preserved brownstones.[7] Thus, the NEWhitney grows out of the small footprint into the zoning envelope, keeping a distance from the existing buildings and that is what gives an unusual shape to its models, a shape reminiscent to a 'dinosaur', according to architects from OMA. Following

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7   The presentation books at OMA are valuable records of the design process and present 'a more comprehensive overview of the main moves in the Whitney conception' (interview with Carol, June 2002). Besides being used at official public presentations, where they are meant to say to the client 'as clearly as possible why these things elucidate architects' (interview with Erez, September 2002), books are also used as internal presentational materials to enable architects from the team to summarize the project at a certain stage, and allow them to stop, *look back* and evaluate it again. They are the office's main publications, carefully kept in the archives.

the process in which the NEWhitney models are made one can witness three major requirements that conditioned design experimentation on its shape: (1) 'not to neglect the Breuer Landmark,' (2) 'not to demolish the adjacent "historically valuable" brownstones,' and (3) 'not to exceed the zoning envelope.' The same 'not to …' requirements (named 'given conditions' by the architects to describe the agreed conditions according to which a design project develops) were a spur to design in the offices of Breuer and Graves, and subsequently shaped the scale models of the Whitney. Going back in history, to the time of Breuer, Graves, Gluckman (and even early-century urban development in New York) to see how these architects answered the given conditions and interpreted the Whitney, and coming back to the Koolhaas office, will compel us to follow a nonlinear time vector moving gradually through back-and-forward steps, tentative, slow and repetitive.[8]

'Not to Neglect the Breuer Building'

A preliminary research regarding how the Breuer building was designed and used was conducted by architects from OMA, covering relevant aspects of the building *to be* extended: its use, appearance, and distinctive architectonic features. The conclusions were incorporated into diagrams and experimental models and served as input in design. 'We really did a great deal of research into *how the Breuer was used*, how it was at the beginning,

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8   Like the designers I was led to find out more and more architectural statements, digging out into texts and press clippings, and deciphering images and diagrams of Graves and Breuer, thus finding myself in the midst of controversies. As Latour put it: 'when we approach the places where facts and machines are made, we get into the midst of controversies. The closer they are the more controversial they become' (see Latour, 1987, p. 30).

and how it is now. And *the conclusion was embedded* in this type of pro-
gramme: shopping, shows, etc.'[9]

The question of 'how the Breuer was used and how it is now' also
guided the museum curators together with the Whitney director right
from the very first needs assessment reports prepared for the Board of
Trustees. Engaging in such an evaluation of the museum's needs, director
Max Anderson stated: 'planning the programme for an expanded facil-
ity is always complicated – more so than planning a new free-standing
structure.'[10] Planning a museum programme *according to* the changing
conditions of an extant building is considered to be a more difficult ven-
ture than programming an entirely new museum facility, because extension
requires to look closely at the Breuer building, comparing and assessing its
facilities so as to accommodate the new programme. Anderson noted that
the Breuer building was designed with exhibitions in mind and not with
the care of an enormous public audience. Today, the museum has to cope
with an average of over 650,000 visitors each year, and in an expanded
facility the figure is likely to rise to over a million visitors annually. Only
slightly over 1 per cent of the museum's world-renowned collection is on
view in the present day, as the museum was designed initially without
regard for a permanent home for a growing collection. Built in the 1960s
specifically for art, the Breuer building was not meant to cater for things
such as concerts, a theatre or a shop. Yet these activities are considered a
vital part of the museum. In the museum's accounts, the NEWhitney is
defined *according to* the Breuer building, designated a Landmark in 1996.
Concluding this evaluation, the museum director stated that the Whitney
requires new galleries for the collection and exhibitions, new storage and
handling space, and adequate display and study spaces. In addition, as the
museum aims to foster innovation in research and education, an appro-
priate state-of-the-art auditorium, classrooms, library and a satisfactory
entrance and circulation space are needed. For the museum to attract,
startle and enrich its public, an attractive entrance with shop and larger

9   Interview with Sarah, November 2001.
10   'An Addition to the Whitney', 28 October 2000, Whitney Archives, p. 2.

commercial space is to be designed, together with a larger restaurant and entertainment space.

From the very beginning the purpose of the addition is understood by the museum staff not simply as an attempt to add more gallery space to the existing museum, but to 'make up for the deficiencies of the old building from the 1960s'. Therefore, the extension is regarded as an architectural tool *to correct* and improve the Breuer building. Although the first intentions of the client are to commission an extension of the Whitney that will repair and complete what has been left out of the previous design, the Board of Trustees set an important condition for the extension's design – 'not to neglect the Breuer building'. Among the nine criteria for selecting the architect of the Whitney extension is the following important condition: he must have 'empathy for the character of the Breuer building'.[11]

Architects from OMA also interpret the extension as demanding a respectful attitude towards this noteworthy edifice.[12] As the NEWhitney proposal was developed jointly by the Whitney and OMA 'in response to the Whitney's needs', both the museum staff and designers spoke on behalf of the museum's functional requirements and strove to make this object express its needs and concerns. The results of this joint conceptual work were presented to the Planning Committee on 10 September 2001,

11   Other important criteria for selecting the architect of the Whitney extension included: 'a radically fresh and progressive sensibility', 'curiosity and sympathy for Whitney's consistently cutting-edge mission', 'no other major museums built by the architect to which the Whitney will take a back seat' (like Breuer), etc. Reflecting on the importance of this figure for the museum's mission, the Whitney Board stated in September 2001: 'the selection of an architect would be the single most important step *we take in helping us define who we are*' (see '75th Anniversary Campaign Case Statement', Draft of 18 September 2001, OMA Archives, p. 14).

12   One of the main questions discussed in conservation studies is the one of presence or anonymity: should the new architecture have a presence at the site or should it be anonymous, should it stand out as an obvious insertion or blend quietly into its surroundings, should it be exuberant or self-sufficient? This is also the question of the visibility of new architecture in opposition with old architecture (see Strike, 1994).

and were judged to be a 'startling and powerful' design '*answering the Whitney's needs precisely*'.[13]

Twenty years before Koolhaas, Michael Graves, also commissioned to design a Whitney extension, interpreted the Breuer building in a way that was considered to be disrespectful to that 'important modernist building'. One of the reasons for the rejection of Graves' projects in the 1980s was the fact that the design overwhelmed and obscured the Breuer building (see Figure 2.2). Although the Breuer was not designated as a landmark at that time, Graves was strongly criticized both by the architectural community and the building's neighbours for showing disrespect to the original museum. Reflecting on the capacity of the institution to express and convey messages, the architect Marcel Breuer, twenty years before Graves and forty years before Koolhaas, defined its profile as follows:

> What should a museum look like, a museum in Manhattan? What is its relationship to the New York landscape? What does it *express*? What is its architectural *message*? … Its form and its material should have identity and weight in the neighbourhood of fifty-storey skyscrapers, of mile-long bridges, in the midst of the dynamic jungle of our colourful city. It should be an independent and self-relying unit to history, and at the same time it should have visual connection to the street. It should transform the vitality of the street into the sincerity and profundity of art.[14]

13   '75th Anniversary Campaign Case Statement', Draft of 18 September 2001, OMA Archives, p. 20.

14   Breuer, Marcel, 'The Architectural Approach to the Design of the Whitney Museum', 1965, Whitney Archives. Marcel Breuer won the commission for designing the Whitney in 1963 after a series of interviews with architects such as I.M. Pei, Paul Rudolph and Louis Kahn. Born in Pécs, Hungary in 1902, Breuer was trained in the famous school of design Bauhaus in Weimar where modern principles, technologies and the application of new materials were encouraged in both the industrial and fine arts. His earliest projects were two legendary chair designs and residential work in Germany. After 1937 he moved to America where he set up an architectural studio with Walter Gropius in Massachusetts and together they designed the Pennsylvania Pavilion at the 1939 New York's World Fair. In 1941 Breuer set up his own office and in the period between 1940 and 1950 designed seventy private houses. In 1946 he moved to New York City and thereafter attracted numerous major commissions including the Sarah Lawrence College Theatre, Bronxville NY, St Johns Abbey, in

The gap between the Breuer and the neighbouring buildings, the massive concrete wall separating it entirely from the adjacent edifices, the granite parapet along the sidewalk and the concrete bridge over the moat – all these architectural elements strengthened the Breuer building's striking granite presence at the southeast corner of Madison Avenue, and contributed to the shaping of the building as 'a sculpture with rather serious functional requirements', while at the same time helping it to achieve autonomy. Thus, to extend such an 'independent and self-relying unit' required an effort that had to go beyond the simple functional joining of structures.

The Koolhaas Whitney, stated the museum Board, 'neither encroaches on the brownstones nor on the Breuer building'. Instead, 'in an electrifying *homage* to Breuer's inverted geometry, it hovers over the Whitney campus, with a dramatic profile'. According to the museum, 'the NEWhitney nods toward the 1966 building by Breuer, and effectively *frees* the Breuer building from isolation by echoing its disruption of the grid'. With Koolhaas's intervention, the Breuer is redefined to the extent that it is treated as being '*injected* with new vigour and purpose'.[15] The new design was contrary to well-established building preservation strategies.[16] Instead of adjoining a

Collegeville Minnesota, and the IBM research centre in La Guade, France. In 1953 he worked as part of a team designing the UNESCO building in Paris and also designed the Bijenkorff department store in Rotterdam. Marcel Breuer was one of the most influential architects of the International Style who was very concerned with the uses of newly developed materials and technology. In the 1960s he began using concrete for his architectural commissions and became known with the innovative way in which this material was used to make a building look like it has been sculptured out of one complete block of concrete. The Whitney Museum is an eminent example for this.

15   '75th Anniversary Campaign Case Statement', Draft of 18 September 2001, OMA Archives, p. 21.

16   Conservation studies identify different 'types and characteristics of connections that are being made by new architecture and the existing historic sites'. Among the most common strategies are: connecting old and new by 'association', and connecting old and new by 'assimilation'. Responding to or being reminiscent of earlier periods in history, a connection by 'association' relies on the memory of old buildings, making use of their location, spirit, form and typology; it suggests the symbolic power of buildings and relies on the subjective perception of the viewer who should be able

massive construction to the Breuer building, 'a box next to a box',[17] new to old, the OMA design comprises a complex of three buildings integrating the existing Breuer building, the adjacent brownstones owned and rented to tenants by the museum, and a new portion.

> We thought that keeping the brownstones was more challenging and interesting. And with this in mind we discovered that *three* [buildings] is a number that is good for extension, because if it's one-to-one it becomes like a mirror: 'new and old', 'good and bad', it always comes down to dualism. And also covering the whole zoning envelope, if you look at M. Graves, his proposal was not *very respectful towards the Breuer building*, so we did something different.[18]

Escaping a binary model of extension, composed of the existing building and the added entity, the NEWhitney's growth is instead expressed in terms of 'wingness': it is 'a collection of wings', according to AMO architect Wouter Davids.[19] Designers interpret the actual Whitney site as a conglomeration of buildings attached to each other. They isolate each one of the existing entities in this conglomeration, make them autonomous, transform them and reconnect them in a wing-like fashion. In this ensemble, each of its three parts will be submitted to modifications and will become to a certain extent renewed: the Breuer building (approximately 44,810 gross square feet [gsf]) will be updated, re-appropriated, and restored; the five Madison Avenue brownstones (approximately 38,180 gsf) will be submitted to *comprehensive alterations* and the domestic space re-conversed for the purposes of displaying art; and an entirely new Tower Building, also

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to make connections (to associate and recognize similarities) between their symbolic aspects and referential characteristics. Connection by 'assimilation' denotes a process through which new architecture can be linked to a historic site (or building) by forming a reference to a physical element of the existing fabric; the new building assimilates and builds upon old elements of the site or the existing building. Building extension is considered to be a type of connection by assimilation, a special variation of the 'mother and child' design strategy: the new repeats the shape of the old, has relatively the same size and is being assimilated by it (see Strike, 1994).

17   NEWhitney presentation book, 2002, OMA Archives.

18   Interview with Sho, April 2002.

19   AMO is the think tank of the OMA architectural firm.

called the 'experience-wing' (approximately 78,000 gsf spread over fifteen storeys), will be *built* to host the Whitney's programme of contemporary exhibitions. Altogether the three buildings will encompass 161,150 gsf.[20] 'Rather than being an adjunct wing, the new extension is the core of the complex, and unites the entire site', as the OMA presentation book put it.[21] In the NEWhitney the space dedicated to the chronological display of the collection will be doubled and it will have almost the same amount of space as the final Graves plan, but without building on top of the Breuer building or demolishing the brownstones. The ensemble of distinct but interconnected spaces also proposes new exhibition typologies, in which the two museum programmes, exhibition and entertainment, will overlap and the three wings will be incorporated into one programmatic ensemble. Therefore, the Whitney extension is viewed as a means of reconfiguring and reorganising the existing museum and the adjacent buildings, rearranging the extant spaces and reinventing the museum's programme, instead of creating *ex nihilo* an entirely new museum piece, a self-contained and isolated bulk. In that sense, to design the Whitney extension means to redesign entirely the Whitney.

While maintaining their individuality, the wings are nevertheless clearly connected on key levels; for instance, a new lobby on level three is concurrent with all of the buildings and is the dispersion point for visitors. The connections between the NEWhitney wings are defined in different ways. Designers from OMA and DCI assumed 'alterations to and new construction of interiors of the existing Breuer building will be very carefully undertaken using materials and systems matching, or comparable to the original. For all new constructions, durable and aesthetically pleasing materials as prescribed by OMA are to be used for all gallery and public

20   The project amounted to a competitive Bid Cost (demolition and removals, building construction, site work, general conditions of contract, insurances, escalation to 2004) of $89.9 million in July 2001 and a Construction Cost of $131.2 million in July 2004.

21   NEWhitney presentation book, 2002, OMA Archives.

circulation areas to accommodate high-density public visitor traffic.'[22] The choice of concrete for cladding is also *consistent* with the use of the material in large areas of the Breuer building, including highly visible secondary facades, which would synchronize with the new building. The new galleries (the surface of which almost doubles that of the existing galleries to make a total of 25,000 square feet) should be *contiguous* with and at the same grade as galleries in the existing building – on the third, fourth and possibly the fifth floor. State-of-the-art lighting is considered a priority, and should be *consistent* with that in the Breuer building, and the extension. The dedicated space for art storage that will allow for works on loan, consignment, or deposit, as well as for works in the permanent collection also has to be *contiguous* with the subcellar in the Breuer building.

The links between the buildings in the ensemble are shown at the level of the floors connecting the galleries, as one can witness this on the following section of the NEWhitney (Figure 5).

The section of NEWhitney, presented on Figure 5, *argues* that the OMA design will rather propose a harmonious and continuous new ensemble. A particular distribution of the collection is also anticipated: the brownstones will be used for the pre-war collection, so that the scale of art matches the brownstones' scale; the post-war collection will remain in the Breuer building; and in the new portion of the building there will be changing exhibitions, including those showcasing special new media technologies. The display follows a logical vertical layering down of the programme. In this ensemble of three buildings, the new addition acts as a mechanism to connect the two other existing parts.

22   'NEWhitney Museum of American Art', Programme/Concept Design, Budget, prepared together with DCI and Arups, 8 August 2001, New York, Whitney Archives, p. 10.
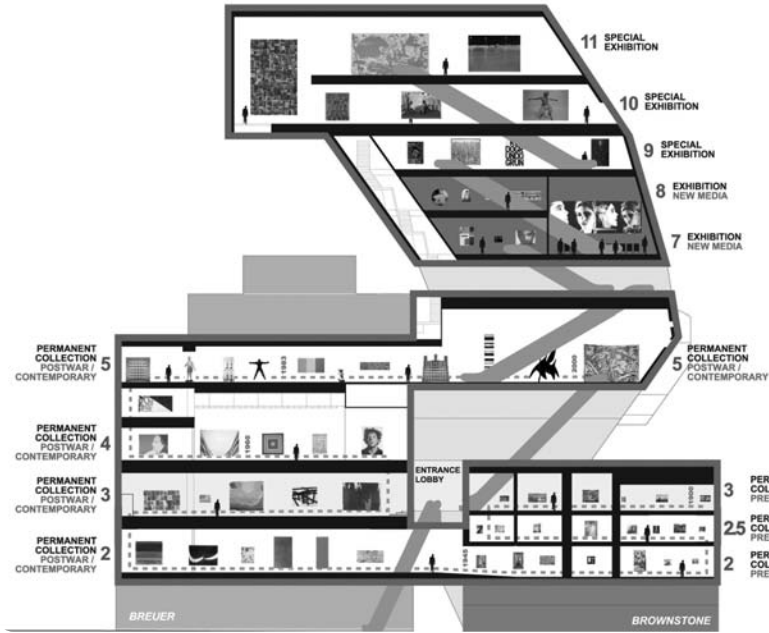
Figure 5: Section of the NEWhitney (© OMA)

Some of the connections between the three buildings are maintained according to their mechanisms of circulation:

REM [pointing to the scheme]: 'It's under the level of the opening? Until where is it?'

EREZ [pointing to the image on the table]: 'Until here.'

REM: 'It's a smart idea. What I like here is that it will give you 10 m of space, like this one [points to another part of the model]. The Breuer building is always going *to retain its identity* and this will be never possible *without maintaining some form of vertical transport …* The issue of continuity is important! If we want to create some sort of split between the lobby here and here [the Breuer], it will be interesting. Yes, some sort of split level will be more exciting than what we have here.'[23]

23   Team discussion, September 2002.

As Rem put it in the discussion with architects from the Whitney
team, it is impossible to 'retain the identity' of the Breuer building without
maintaining some form of 'vertical transport'.[24] That is how analogous cir-
culation principles have been set up in the buildings so that the NEWhit-
ney is defined, like the Breuer, as a museum that has a small footprint and
possesses the verticality of a tower. This is also an important requirement
in the specific choices made by the architects as to how to show the egress
or the elevator in the models of the Breuer building. The existing, very
large elevator in the Breuer is supposed to span the whole NEWhitney
ensemble and to remain a central object of circulation, allowing visitors to
go up with it and then come down by means of the staircases. Thus, visitors
are taken quickly to the collections, whereas going down via the staircase
necessitates a slower walk through the museum and affords different views
of the city. The new entry will be situated in the space between the Breuer
and the brownstones; the old Breuer is maintained for art events, electoral
happenings, school visits and lectures. In that sense the Breuer lobby will
be kept as a public space, as it was originally intended to be. Thus, for
designers at OMA, to 'respect the Breuer building' meant to uphold and
continue in the new ensemble the way the Breuer building worked, i.e. by
maintaining the same circulation principle and the design mechanisms that
made it possible (the elevator and the building's entrance), by interpreting
the Breuer building according to the criteria architecturally pinpointed in
the extension proposal.

    To maintain the architectural identity of the old building means to
intensify its functional links with the new parts. The NEWhitney is all
about how it relates to the Breuer, sees and interprets the Breuer's specifi-
city and the way its architecture works. To extend means to interpret the

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24   In an enquiry launched in the 1970s, Don Celender asked 150 museums throughout
the world to send a photograph of their loading dock. On this occasion a representa-
tive of the Whitney explained the difficulties of circulation, and stated: 'our receiv-
ing area is not the ideal. It is located on a narrow cross street in Manhattan where
parking is allowed on both sides. Our freight elevator does not go to our galleries
but rather only down to the basement which can be a great inconvenience.' Nancy
McGary, letter to Donald Celender, 10 November 1975 (see Celender, 1975).

Breuer, to reappraise it anew. It is not just an addition to the floor area of
the existing building, a new arm attached on an old body, an increase in the
size of another structure, or an increase in that portion of land occupied by
it. Instead, it recalls and actualizes those basic aspects that made it specific
at the time of its construction: circulation, connectivity and verticality. The
building and its extension mobilize the same elements in a different way,
and play as two different compositions, two moments of a single process.

   In a meeting with curators in February 2002 Rem Koolhaas presented
the design of NEWhitney and engaged in discussions on the specificity
of museum extension, of museums and American art. Commenting on a
variety of examples of recent museum extensions, Rem argued that there is
something wrong with them, because after they were realized they changed
radically the museum spaces and turned them into 'a mixture of modern-
ist labyrinth and classic display'.[25] 'Something happened in these spaces
when they got reopened', stated Rem and that is, I think what he feared
for the Whitney. Remaining fearful of destroying something from the
existing museum that shapes its specificity and character, designers from
OMA attempted to understand the way the old museum functions, not to
break with its past, but to continue, increase, intensify and prolong these
distinctive features. Complying with the given design requirement 'not to
neglect the Breuer building', Koolhaas' NEWhitney reinvented entirely
the way of 'respecting' an old architecturally significant building – not by
preserving its physical integrity and architectonical fabric, but by interpret-
ing it, recollecting and reinventing it in a fine balance of conservation and
innovation. Further on in the process, architects engaged in recognizing,
retrieving, detecting, integrating, and relating these features with the other
parts so as to create a working architectural ensemble. That is what gave
the NEWhitney model the shape of a tentative assemblage standing on
a very tiny footprint, balanced between the Breuer and the brownstones,
attempting to establish working connections between them while still
maintaining their distinctive profiles. The flexible and interconnected

25   Discussion of Rem Koolhaas with curators, artists and museum professionals,
     February 2002.

ensemble of three buildings, resulting from the interpretation of the intricate constraints of the Whitney site is a non-orthogonal museum standing out from the standard, rectangular grid-defined streetscape of New York. As the architects from the Whitney team argued, 'it should be different from other buildings, as it's a museum'.[26, 27]

'Not to Demolish the Brownstones'

The NEWhitney should also have a very tiny footprint because adjacent to the Breuer building, on the East side of Madison Avenue, between East 74th and 75th Street, are located six brownstones buildings owned by the museum. They date from the last quarter of the nineteenth century, when during the first urbanization wave in the Upper East Side Historic District of New York numerous brick and brownstone rows of houses were erected by speculative developers. Five of them are meant to be incorporated into the NEWhitney ensemble.[28] Architects from OMA discussed

26   Interview with Sho, June 2002.
27   The orthogonal mould of iconic New York museums was only broken in the major
      examples of the Guggenheim and the Whitney. This is also the reason why the
      Whitney was often compared to the Guggenheim, especially in the 1980s, when the
      museums simultaneously launched expansion campaigns. All other museums in the
      city maintained the orthogonal structure at the time (see Chapter Two).
28   The Madison Avenue brownstones and the East 74th Street brownstones were built
      in the 1860s and 1870s together with other row houses and were acquired by the
      Whitney prior to the formation of the Historic District for the purpose of expand-
      ing the Museum. They were scheduled to be razed, for the museum predicted that
      extension would be needed in the future. However, four of them were subsequently
      designated as 'contributing buildings' in the Upper East Site Historical District
      and approval for their demolition was required by the Landmarks Preservation
      Commission. In addition, any design plan for the Whitney extension has to pass a
      review by the City Planning Commission, the Board of Estimate, and Community
      Board 8.

different modes of relationship with these adjacent buildings: to ignore them, to absorb them, or to explore them. The directive given to OMA was that the Landmarks Commission would not permit the demolition of the brownstones. If demolition of the Madison Avenue brownstones were an option, the estimate is that the Whitney could build a smaller (by 20 per cent), 'no-style' building for approximately $60 million less than the design proposal. Architects also considered the fact that there are recent modern museum additions where the perceived virtuosity of the proposal outweighed the loss of the historic, permitting demolition.

Looking at the site Landmarks diagram, one would wonder: Where is the new addition going to be? Which site slot is it going to fill?
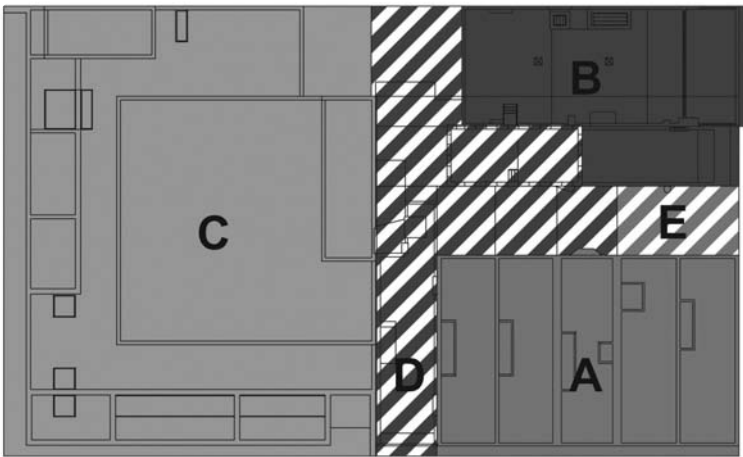
Figure 6: Landmarks diagram (© OMA)

To explain why the Whitney should start from a very tiny footprint, OMA designers produced the Landmarks diagram shown in Figure 6 to explain to non-architects and clients how the Whitney team interpreted the site. It describes each of the buildings in terms of whether they 'can be taken away' according to the Landmarks Commission. The Breuer building is marked with C, and is considered to be an irremovable Landmark,

designated as such in 1996. The Madison Avenue brownstones and the 74th Street brownstones, are marked respectively with A and B. E stands for the extension to the 933 Madison brownstones. They are all regarded as 'contributing' to the historic fabric. Although they are not individually designated landmarks, they cannot be taken away without the permission of the Landmarks Preservation Commission. Standing between these unmovable and prioritized buildings, the only portion on the site that can be altered and removed is marked with D. This is the 943 Madison Avenue brownstone building considered to be a 'no-style' building, i.e. 'non-contributing', and which is therefore interpreted by architects as the only removable part of the site.

To understand the diagram's logic, we need to understand what a 'no-style' building means in the universe of eclectic styles in New York City, and why such a building can be removed. To do this, we need to move from the table with the diagrams to the folders behind Carol, i.e. we need to go back in time, to the 1980s, when the brownstones in question were interpreted differently by the architect Graves, namely as removable. The Landmarks Commission required a certificate of appropriateness for the demolition of these five row houses (designated with A on the diagram). At that time the brownstones were considered as landmarks whereas the Breuer building had not yet been designated as such. A historian of architecture, Terrance R. Williams, was commissioned to provide a report concerning the demolition issue for the public hearing of the Landmarks Commission on 19 May 1987. The Williams report considered the 'extraordinary variety' within the Upper East Side Historic District. To review the diversity of the district Williams' report grouped all the buildings listed in the Designation Report according to their styles.[29] Covering sixty blocks, the district contains more than 1000 buildings of diverse styles, scales, uses and dates of construction, unlike other historic districts in New York City, which are characterized by a cohesive stock of buildings which are uniform in scale and style. The report noted that there are 138 building styles listed,

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29   Composed of four volumes and 1386 pages, the Commission's Designation Report devoted most of its content to a geographic inventory of buildings in the District.

including every style variant enumerated.[30] As listed in the Landmarks Commission Designation report the buildings in the district are of two types: 'style' buildings, which are considered to be 'contributing', and thus not appropriate for demolition, and 'no-style' buildings, which may be demolished and which provide an opportunity for future development within the district. Of these, the largest category is 'No Style', with 139 buildings. The tiny segment on the diagram designated with D corresponds to one of the 139 'no-style' buildings.[31]

Leafing through the Williams report, as architects from OMA did, we can identify two groups of 'no-style' buildings. The first group includes approximately twenty-three residential buildings, ranging between twelve and twenty-one storeys, which for the most part are located on the avenues. Many of these buildings were built in the last thirty years. These large, recently constructed buildings are considered by the report, on a practical level, to be inappropriate sites for redevelopment in the foreseeable future. The second group consists of widely scattered rows of brownstones, largely in the mid-blocks, mostly of three to five storeys. Many of these buildings already fully utilize the available zoning envelope. Very few of them occupy sites more than 25 or 30 feet wide. The Williams report concluded that none of these groups is really appropriate for new development, particularly for institutional buildings or buildings other than new townhouses.

30   When these styles variants are grouped, the number of styles is close to sixty among the more than 1000 buildings in the District. (There is no single building style represented by more than 150 buildings, or more than 15 per cent of the total.)

31   According to the revised Appendix A and the Revised Exhibit 1 to Williams' *Inventory of Building Styles*, the other largest style categories (including their variants) are Beaux Arts (approximately sixty-seven), Italianate (approximately sixty-three), Italianate/Neo-Grec (approximately eighteen), Modern (approximately twenty-nine), Neo-Classical (approximately sixty), Neo-Federal (approximately 106), Neo-French Classic (approximately forty-two), Neo-Georgian (approximately seventy-two), Neo-Grec (approximately 116), Neo-Italianate Renaissance (approximately fifty), Neo-Renaissance (approximately ninety-four), and Queen Anne (approximately thirty-nine). These styles are the only ones with eighteen or more buildings in the District. Excluding 'no-style' buildings, they comprise approximately 756 of the 1034 buildings in the District, referred to as 'contributing' to the historic district.

Consequently they can be demolished in order to allow further development in the district. As shown in the Williams report, there are regulations regarding the demolition of old buildings, which are also meant to establish a legalized and controlled rhythm of changes so as to maintain a proportion of old and new buildings in the district. The D-slot on the diagram (Figure 6) corresponds to a 'no-style' building, thus designated as 'non-contributing' to the historical fabric of the district, and considered as removable. That removable D-part of the site will allow new development to happen. That is where the new tower of the NEWhitney could be built and connected with the adjacent buildings.

The initial demand for an extension, as defined by the Whitney Museum Board in 2000, reveals the preliminary needs assessment. The 74th East Street brownstones are currently part of the museum, partially occupied by the staff, and as they were renovated in 1996 the main client's assumption is that they will remain an integral part of the museum support areas, or 'non-public area'.[32] However, there is no clear indication as to how to integrate the other brownstones (neither the Madison Avenue brownstones – A – nor the 74th Street brownstones – B) in the NEWhitney.[33] The OMA design suggested keeping the renovated 31 and 33 74th Street brownstones and using the Madison Avenue brownstones for art display, installing part of the permanent collection in them. OMA sees this as an opportunity 'to turn these neglected buildings into a *touchstone* of the Whitney's early history, which began on a continuous brownstone on 8th Street',[34] the Green Village brownstone, long before the Breuer building was erected in 1966. Acquired by the sculptor and promoter of American artists Gertrude Vanderbilt Whitney in 1913, this brownstone was transformed into an exhibition centre by the architect Grosvernor Atterbury for the display of Whitney's collection. A year later, in 1914, it opened its doors as the Whitney Studio, where the first Whitney collection was housed and

32   The library where I found the majority of the Whitney Archives is located in the brownstone building on 33 East 74th Street.
33   'An Addition to the Whitney', 28 October 2000, OMA Archives.
34   'A Campaign for the New Whitney', 18 September 2001, OMA Archives.

where the Whitney Studio Galleries shows were held in 1929. In 1930–1 the architect G. McCullogh Miller was commissioned to design the first Whitney museum after the reconstruction and alteration of three old row houses into a building with a single facade. Architecturally, the only changes made after the initial remodelling of the three brownstones was the addition of four new galleries in 1939, an expansion that almost doubled the existing gallery space. Thus, both the architecture of the Whitney Studio (1914) and the first Whitney Museum (1930) relied on the reuse and adaptation of old row houses for the purposes of art display. From its very beginning the Whitney design relied on redesign. Keeping the brownstones in the NEWhitney ensemble instead of tearing them down and using them for art display therefore arises out of a particular interpretation of the Whitney's early history. The NEWhitney appears in the understanding of the designing architects as a historicized version of the old museum: every design element is treated and presented as historical, and the concept is influenced by previous Whitney designs and extension trials. Instead of radically breaking with the past, the NEWhitney propels a new entity, drawing extensively on the design solutions and interpretations of the first architects of the Whitney Studio, Breuer and Graves, composing a new ensemble out of existing fragments and according to related design issues from the past.

By restoring and adapting the late nineteenth-century brownstones to house the Whitney's early twentieth-century collection and remodelling the internal space for the purposes of art display on a domestic scale, architects were led to redefine and re-establish the Whitney as a domestically scaled 'home' for artists like John Sloan, Robert Henri, and Edward Hopper. The museum was reinterpreted again, on the occasion of the extension plans, as a 'house museum', distinguished by its informality, familiarity and 'living qualities'.[35]

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35   This 'home' aspect was strengthened by the internal design of the museum, enriched with numerous home-like furniture and intimate design solutions. The museum was a 'family' undertaking funded and directed by the Whitney family members until 1961 (when some non-Whitney relatives members entered the Board of Trustees). In a telegram from 1966, recovered in the museum archives, Nelson Rockefeller

By contrast, the Madison Avenue brownstones and the 74th Street brownstones are 'style' buildings, considered as 'contributing' to the historical fabric of the city, and therefore protected by the Landmarks Commission. They fall in the 'Special Madison Avenue Preservation District' as established in the Resolution, which is supposed to preserve and protect the unique character and architectural quality of Madison Avenue and its surrounding area.

> The Landmarks Chair Jennifer Raab said: 'you can take these brownstones down only over my dead body.' But the Whitney office said: you can look at the examples of recent additions in New York, meaning specifically the Museum of Natural History, where the proposal for the new building was viewed positively but they *were not supposed to take down anything old*. So, that gave us the opportunity to do something brilliant without taking down anything old.[36]

To do something brilliant without 'taking down anything old' – that is how the given condition 'not to demolish the brownstones' has been interpreted by architects at work. It appeared, at a first glance, to be a major limitation in design. However, the design plans of the numerous architects of the Whitney interpreted it differently: Breuer thought it unnecessary to demolish the brownstones, while in his three projects Graves saw it as a flexible directive, and Koolhaas, in his scheme A, viewed it as a solid commandment. If the Whitney wanted to plead the case for demolition it could claim hardship and challenge the Landmarks Commission in court arguing that 'the inability to demolish the brownstones places a real and damaging constraint on the ability of the museum to fulfil its goals as a charitable and educational institution.'[37] This course of action would result in litigation lasting perhaps as long as two years and would put the

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congratulated the Whitney family 'for their exciting new home'. The Whitney appointed a director from outside the family for the first time in 1974, hiring Tom Armstrong. This constituted a paradigm shift in the Whitney's museum ideology and a move towards a new type of institution. It is also not by chance that the Whitney's history is written by the Whitney family (see Biddle, 1999).

36   Interview with Carol, February 2002.
37   Interview with Carol, June 2002.

Whitney against not only the Landmarks Commission, but the New York preservation community. It would inevitably lead to long-lasting extension trials similar to those in Graves' time.

Coming back to the Graves proposals of the 1980s, one discovers that both 'style' and 'non-style' brownstones were meant to be torn down to 'clear' the site for the monumental structure of the extension. This means that the requirement 'not to demolish the brownstones' was interpreted differently within a twenty-year time span by the two architects commissioned to design the extension. Was it because the needs of the first museum were more modest that its architecture did not absorb the brownstones' space in Breuer's design as it did in those of Graves and Koolhaas? Or was it because American art developed at different rates during those periods? Rather than deducing the logic of these design moves from the functionality of the museum institution, I argue that the three Whitney architects along with the other protagonists in the design projects, found themselves guided by similar design concerns, but let the Whitney building act differently and interpreted the Whitney's history as related to the brownstones in their own way. That is what gave dissimilar shapes to the proposed extensions.[38]

As soon as Graves presented his initial drawings and models to the Building Committee in the spring of 1985, a strong controversy broke out. The design faced opposition from two different groups of the Whitney's neighbours, who each interpreted Graves' plans differently: one group opposed the demolition of the existing brownstones on Madison to make room for the addition, while the other group opposed Graves' plan to build

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38 Here I do not analyze a building shape as being the product of a number of external 'forces': political and social factors, market formulas, local land-use patterns, municipal codes, zoning legislation, speculative development and real estate cycles, that all together lead *to a specific form of a building* in a particular city at a given moment in time (see Willis, 1995), nor is a building shape the result of a complex pattern language, which expresses a relation between a certain context, a problem, and a solution, and gives each person who uses it the power to create *an infinite variety of new and unique buildings*, just as his ordinary language gives him the power to create an infinite variety of sentences (see Alexander, 1979).

above Breuer's structure.[39] Thus, the Whitney promised to become 'one of the most interesting architectural controversies of the year 1985'.[40] Following the evaluation of the Landmarks Commission a revised, scaled-down design for the Whitney was unveiled in 1987. Once the design was sized down, the neighbours' opinion changed significantly, as they considered the new version of the building to be more accommodating to 'the interests of the community'. In their letters in support of the Whitney's extension in 1987 and addressed to the Chairman of the Landmarks Commission, Gene Norman, they called the brownstones 'slum' buildings, 'deprived of uniqueness' and argued that, 'preservation of the old is important, however, being old, as the brownstones are, is not enough reason to prevent progress, and obstruct the creation of charm and beauty in favour of maintaining eyesores'.[41]

While the neighbours understood the change (which the demolition of the brownstones would entail) to be 'inevitable' and important for 'institutions that achieve maturity and success in serving the community',[42] the museum professionals defended the extension, discussing mainly the museum's needs and leadership role, as well as its crucial cultural and historical mission. What they endorsed was not the specific Graves design, but rather *some solution* to the museum's critical need for 'additional on-site space for display of unique and important art works, as well as for the supporting functions necessary to carry on the essential operations of a major

39   The opinions of the neighbours were expressed by the president of the East 74th Street Block Association, the head of the East 75th Street Block Association, the chairman of the Board of 35 East 75th Street, and the residents of the 930 Fifth Avenue. Although numerous letters from the neighbourhood supported the Whitney extension and defended the Whitney as a cultural institution, some of them raised the dilemma of 'What is more important - to preserve a historical building or to respond to the serious need of a Museum and support its growth?' Preservation of the old has been opposed to progress, charm and beauty, and that is what neighbours hoped for their area.

40   Viladas, Pilar, 'Graves' Whitney Plans', *Progressive Architecture* (July 1985), p. 23.

41   Letter of Dr. Susan Kremnitzer, resident of 930 Fifth Avenue, Whitney Archives.

42   Letter of Monroe Geller, chairman of the Board of 35 East 75th Street, 9 June 1987, Whitney Archives.

art institution'.[43] Avoiding comment on the brownstones issue or Graves' extension design[44] some museum professionals explicitly stated: 'While I am not writing to cast my voice in support of or in opposition to the plans prepared by Michael Graves for the projected expansion of the Whitney museum, I am concerned that restriction and criticism will unnecessarily prohibit the much needed expansion. It is imperative, it seems to me, that *some* accommodation be realized so that the Whitney museum can continue its programmes at the level required by its prestigious collections and exhibitions'.[45] They declared themselves 'incompetent' to judge the design of the extension and only expressed their conviction that the enlargement was indispensable to the future of this important cultural institution.

The most 'competent' in design matters in this controversy were the architects. Twenty-two leading American architects addressed letters in support of the Whitney extension in the period May–June 1987. They discussed more substantially the brownstones demolition issue, stating that these buildings, designed by a speculator and builder Silas M. Styles at the end of the nineteenth century, were 'against the logic of modern development in the historic district'[46] and that to preserve them would expose their 'incongruity with the rest of the area'.[47] Objecting to the conservatism of the preservationist groups, Peter Eisenman wrote in defence of the Whitney extension: 'More great architecture is lost to preservationist appropriateness, which becomes its own zeal and fury, than through the tides of development. Not every brownstone needs to be preserved'.[48] Development and growth as opposed to conservatism were the main strands in the discussion. The brownstones were interpreted by the architects as having

43   Letter of Charles C. Eldredge, director of the National Museum of American Art, Smithsonian Institution, 20 January 1987, Whitney Archives.
44   Only two of the thirty-six letters of support found in the Whitney Archives spoke about Graves and his architectural talents.
45   Letter of the Director of the Cincinnati Art Museum, 17 December 1986, Whitney Archives.
46   Letter of Alan Colquhoun, 9 May 1987, Whitney Archives.
47   Letter of Charles Jencks, 12 May 1987, Whitney Archives.
48   Letter of Peter Eisenman, 19 May 1987, Whitney Archives.

an ordinary and 'dilapidated appearance', as being out of character and scale, and already being an oddity in this part of Madison Avenue because of their small size. The designers claimed also that the brownstones were neither unique nor particularly distinguished buildings, and expressed the conviction that the new addition would compensate and 'make up for their loss',[49] thereby increasing the museum's 'genuine vitality'.[50] This tendency to depreciate the brownstones progressed to the extent that architects labelled them 'background' buildings compared to the 'foreground' Breuer building, and urged the importance of expanding 'a significant cultural institution' at the expense of 'several insignificant brownstones'. Thus, by evaluating Graves' proposal, the architects were led to reinterpret the brownstones entirely: their history, design logic, and congruity with the area. The restriction regarding the demolition of the brownstones because of their 'contribution' to the historic district was considered to be a means of freezing further development and transforming the district into a 'colonial village'. By doing so the historic district would be stuck with the periods and styles it possessed in the 1980s, and would not evolve to include the exemplary and representative architecture of the future.

The report of the historian of architecture Terrance Williams stated at the hearing of the Landmarks Commission in May 1987 that in spite of the possibility of using the corner location of the brownstones building, occupying the avenue and side street frontage, their builder Mr. Styles, treated the sidewall of 933 Madison Avenue in the old fashion and thus failed to 'turn the corner' in a carefully designed way. Treating the side facade with the same consideration, sensitivity and concern for detail as the narrower front one could have meant transforming the buildings into complete three-dimensional objects, increasing the light and air, and affording a more generous principal entry. Hence, the interpretation of the brownstones in the 1980s went as far as to evaluate what the architects at the end of the nineteenth century failed to do: raising the corner of Madison Avenue and 74th Street as an example of vernacular architecture. 'Michael Graves'

49   Letter of James S. Rossant, FAIA, 12 May 1987, Whitney Archives.
50   Letter of Tod Williams and Billie Tscien, 15 May 1987, Whitney Archives.

proposed addition, in contrast, turns the corner in a designed, thoughtful way', argued the Williams report. Here again, the protagonists in the Graves story reinterpreted the brownstones, even evaluating the design strategy of the early century developers, and striving to identify failures and incongruities in the architecture of the existing buildings. What was unsuccessful in their composition and design appearance was now compared to what could be achieved with Graves' design.

In response to the Landmarks Commission, which stated that the demolition 'would undercut the foundation of the City's 51 historic district and send a dangerous signal to property owners regarding the demolition of historic district properties', the museum insisted that its application for a certificate of appropriateness was 'fully consistent with the standards of the Landmarks Law (section 25–301 et. seq. of the Administration Code), and would not establish any generalized precedent putting other landmark properties in jeopardy'.[51] They stated also that it was the Museum that had added one of the most distinguished buildings to the Historical District by giving Marcel Breuer his first major commission for a building in Manhattan and now continued this commitment to architectural quality in its selection of Michael Graves. In this way, the museum's design choices were interpreted as the continuation of a strategy of architectural excellence begun in the 1960s with the Breuer building. It was also a commitment of the museum Board of Trustees in 2000 to continue this tradition, and they believed that the OMA design 'in its imaginative re-use of the brownstones and preservation of the Breuer building's unique identity, will bring significant support to the Whitney's ambitions which otherwise might not be there'.[52]

While at the beginning of the architectural controversy in the 1980s its protagonists were mostly concerned with the massiveness of the bulk and its overpowering height, the discussion was later on shifted entirely

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51 Letter to the Chairman of the Landmarks Preservation Commission, Honourable Gene Norman, 10 July 1987.
52 '75th Anniversary Campaign Case Statement', Draft of 18 September 2001, OMA Archives, p. 28.

to the issue of the brownstones' demolition. In spite of the many letters of
support from architects, museum professionals and the neighbours' com-
munities, as well as the strong endorsement of the museum staff and the
Board of Trustees, Graves' design schemes were all turned down by the
public authorities and commissions, with the main reason said to be the
design move to demolish the brownstones. Twenty years later the brown-
stones issue is widely discussed again by designers at OMA, and the reasons
for keeping these buildings intact are based on a new reinterpretation of
the Whitney's history. As Koolhaas summed up when showing the Graves
project: 'There was a big hostility towards his project, because the brown-
stones are listed as being of historical significance. We are aware of the
historical *balance* to keep it.'[53] Re-examining some issues of preservation,
designers at OMA proposed a solution to what it means to design accord-
ing to the requirements of existing buildings, and to conceive 'appropriate'
architecture. 'Appropriate' for them meant *maintaining* the architectural
identity of the historic buildings; *relating* the extension positively to the
dimensions, scale, materials, details, proportions, and other visible design
characteristics of these buildings; and *contributing* to their evolution by
enriching the sense of historical continuity and meaning. OMA architects
interpreted Breuer and Graves in a historicizing fashion and showed what
their designs could have done in their time to conceive the Whitney dif-
ferently. Designers of the NEWhitney repeatedly went back to Graves,
Breuer and even to the early century developers to gain a better understand-
ing of the brownstones issue, evaluated the design options, solutions and
moves at the time and then returned to the site diagram to incorporate
this knowledge in it (Figure 6). Like the architects, I performed the same
back-and-forth move in time, and by doing so I contributed to the process
of continually reinterpreting the brownstones.

53   Interview with Rem, February 2002.

'Not to Exceed the Zoning Envelope'

Another condition played an important role in the shaping of the NEWhitney models: 'not to exceed the zoning envelope'. But how is the zoning envelope made visible in design? What does the zoning do to the models of the NEWhitney?

This 'tiny transparent cover on the model' (Figure 7), as architects from OMA call it, shows how they manipulate the geometry of the city to stage the new extension of Whitney according to many imperceptible lines, 'street walls', 'curb levels', 'zoning lots', and heights of existing buildings. This is not a humble plexiglas envelope, peacefully covering a bunch of adjacent models, but rather a way of 'obtaining' the new building, and synchronizing it with the city's rhythm. The extension project deals with all these invisible zoning lines, fitting in the Whitney model according to the height restrictions. The 'zoning envelope' indicates 'where architects are allowed to go' and visualizes all the moves of city surgery that make the building happen.[54] It imposes specific 'restrictions on the model', argue architects from OMA, and plays an active role in the model making by regulating buildings' height and adjusting street wall levels, while fighting with the vertical uniformity of the streetscape.

Observing the zoning envelope of the Whitney is a way of tackling the old concern of overbuilding in Manhattan. Architects at OMA use it as a means of helping to avoid some of the negative consequences of uncontrolled city growth. Introduced by the Zoning Resolution Law of 1916, the concept of the 'zoning envelope' aimed at defining the maximum mass allowed by a building – that is, the limits of a spatial envelope beyond which a developer could not build.[55] It stated that after a prescribed vertical height above the sidewalk (150–200 feet for avenues), a building had

54   Interview with Kunlé, April 2002.
55   On the history of the Zoning in New York see Makielski, 1966; Kwartler, 1985; Revell, 1992; Bressi, 1993.
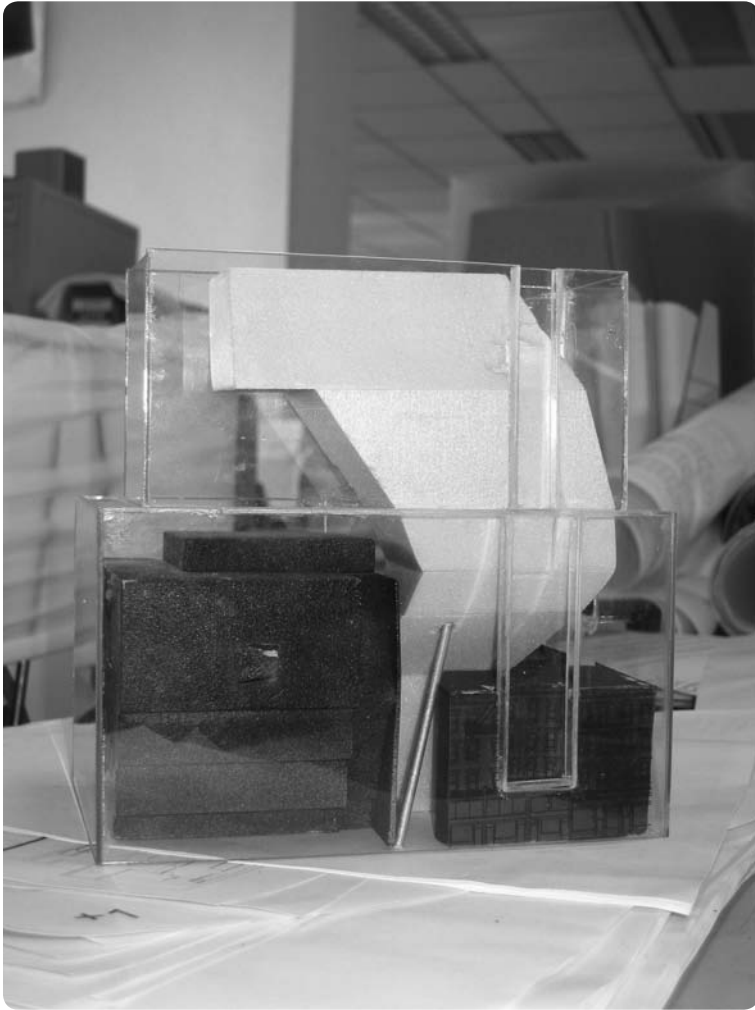
Figure 7: The 'zoning envelope model' of the NEWhitney
(photograph by the author)

to be stepped back within a diagonal plane projected from the centre of the street.

This law shaped the geography of New York almost a century after the Commissioners' plan.[56] It brought into being attempts to solve the perennial problem of overbuilding, to protect the high and extremely vulnerable values of commercial land in Manhattan, and to control height in a city with a rigidly established horizontal geometry, whose only chance for diversity and creativity in reinventing a variable urban fabric was vertical expansion.[57] Expressing his fascination with New York City's zoning as a framework for design creativity, Rem Koolhaas put it: 'the Zoning Law is not only a legal document; it is also a design project.'[58] Following architects at work in his office, one can witness how the 'zoning envelope' acts like a real architect (Kwartler, 1985) to shape the NEWhitney building, along with the many other designers, limiting their actions and providing inputs of new design solutions and shapes. Interpreting the zoning envelope regulations, designers from OMA suggested a different way of 'filling the envelope'; the NEWhitney complied with the zoning, without however proposing a 'setback' design like that of Graves. Permissible envelopes are usually filled to the maximum, and this invariably leads to a lack of variety in design and produces inexorably similar buildings. Michael Graves fell into this trap. OMA's solution avoids uniformity in vertical terms, escapes monotonous harmony, and proposes a building that can contribute to a greater extent to the eclectic landscape of Madison Avenue. Circumventing the set-back style, the so-called 'modern style', the unusual 'mammoth-

56   The very first Commissioners' Plan of 1811 aimed at regulating the city structure, which was imposed as an orthogonal grid on the empty terrain. This net mapped rigidly the wilds of Manhattan onto a rational Cartesian plane and presented a pattern of undifferentiated streets opening in every direction.

57   Trying to overcome the limitation of the grid, architects at the beginning of the twentieth century had to build storey upon storey to multiply the value of land. If this unprecedented building process at the beginning of the century was not controlled the city could have expanded in an unpredictable way, and its geometry would have been distorted.

58   Koolhaas, 1978, p. 107.

like' structure of the NEWhitney would escape from the fixed and limited geometry of most of the buildings on the Upper East Side, and would seize again a non-orthogonal shape, as Breuer did in the 1960s, and Graves failed to do in the 1980s conceiving as he did a building with a standard orthogonal outline.

Yet, these zoning regulations had already been exceeded. In 1996, Richard Gluckman was hired to transform two town houses (31 and 33 East 74th Street) into offices for the administrative staff and connect them to the Breuer building. Gluckman's intervention also converted the fifth floor and the fourth floor mezzanine of the Breuer building into exhibition space. When these brownstones were renovated the zoning limits were breached, but the museum nevertheless received approval for Gluckman's extension, which was successfully built.[59] Architects at OMA kept the Gluckman part of the Whitney as it was, because, as they confessed: 'we are afraid to break it down completely, because if we break it down then we have to go again through the same process of meeting the zoning limits. It's again a whole new process. And they will not let us exceed the zoning limits again. They will never give us permission to do that. So, it makes sense to keep the Gluckman extension, because it just simply means that we have more space to work with.'[60] Thus, it appears that in Gluckman's interpretation the strict zoning envelope limitations were considered a flexible given condition in the design process. Gluckman 'filled' the zoning by exceeding it, and that is how he redefined the Whitney. Koolhaas' design keeps

59   The project budgeted at $13.5 million, added some 13,000 square feet to the museum (about a 25 per cent increase), with no visible change to the building's exterior, and was widely perceived as successful by both the museum and the public, particularly after the Michael Graves debacle of a decade before. The person in charge with this late 1990s Whitney extension was the deputy director Richard Holmes. Together with Max Anderson, the actual director of Whitney, they were the ones who gave regular input and directions to the most recent expansion plans of Koolhaas; they remained in close contact with architects in Rotterdam, exchanging faxes and e-mails on a daily basis, commenting on the last design options and updated plans and models.

60   Interview with Erez, February 2002.

this 'misfit' so as to avoid another controversy over the zoning regulations like the one in Graves' time.

The issue of how exactly the zoning envelope was treated by Graves in the 1980s was crucial for the architects at OMA – he 'filled' it almost completely by using all the space inside it, creating such a massive block that it was almost as big as the footprint of the 74th block on Madison Avenue. The vertical space was filled out as much as its horizontal basis without exceeding the envelope's contours. Thus, 'filling' for Graves meant overflowing, and that is exactly what provoked the protests of neighbours, historical preservation groups and the City Planning Commission and nourished the controversy for such a long time.

Looking back at the 1960s reveals that the original Breuer building suggested a very particular and unusual (for New York) way of 'filling' the zoning envelope – an inverted pyramid. 'Hollow below and substantial on top',[61] it contrasted with many other New York buildings, whose structures with subsequent setbacks contained an enormous bulk in the base progressively decreasing in mass as one gets to the top of the building. The peculiar Breuer treatment of the envelope meant a rupture with the zoning conventions. This solution meant equally diversity for the fabric of New York. Defying the laws of gravity, the original building was unable to 'fill' the zoning envelope with its inverted pyramid structure – a solution disliked for a long time by the public. OMA designers, too, suggested a structure which is thinner at its base and acquires mass and volume as it goes up; as such the extension plan is reminiscent of Breuer's building and contrasts sharply with Graves' solution. This advocates once more an interpretation of the Breuer building's very fabric, re-appraised by the designers of the NEWhitny after a detailed interpretation of Whitney's history.

Providing different answers to the zoning question, Gluckman, Graves, and Breuer entered the office of Koolhaas. 'Not to exceed the zoning envelope' was interpreted by architects at OMA as: 'to fit the zoning envelope without filling it entirely like Graves did', and 'to fit it without exceeding it again like Gluckman did, but maintaining the Gluckman achievement'.

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61   That is how Breuer defined the museum (see Stoller, 2000, p. 8).

These translations of the zoning requirement added new features to the profiles of the NEWhitney models and shaped them accordingly. The zoning became an important condition for every model maker and stipulated further steps in the design process. Complying with it, numerous zoning envelope models were built in the Koolhaas office during the course of 2002.

   Thus, engaging in an astute, elaborate, and routine historical enquiry, the designers re-examined, interpreted and recomposed the Whitney's meaning and repertoire of actions, and *added* more interpretations to the Breuer building, the brownstones and the city geometry. At the same time more requirements and given conditions rolled up together and shaped the models. The making of the NEWhitney appeared in this process as a set of complex actions performed in connection with a collection of design issues and requirements rather than as an attempt to capture the intrinsic properties of the building to be extended.

Recollecting the Building's Trajectory

What was about the Whitney building that provoked so many reactions, good and bad, at the time of its construction and at the time of its extension plans? What kind of actors responded to the museum's actions, and claimed to speak on its behalf? What kind of new associations were traced among the protagonists in the design controversies? Rather than attempting to deduce Whitney's meaning from the mythologies of the 1960s or the 1980s and the processes by which Breuer and Graves generated design, I will simply recollect here the Whitney *trajectory*, or to use another expression popularized by anthropologists, the building career (Appadurai, 1986; Tamen, 2001). As OMA architects found out by going back to history – the Whitney has an amazing social career rich of controversies. To recollect it, I draw on the selected corpus of OMA archives: mainly press releases from the 1960s and the 1980s, images, plans, and various Whitney museum documents such as petitions, reports, letters of protest or support, proceedings of the Board of the Trustees.[1]

Recollecting the Whitney of Breuer (Figure 2.1) and the Whitney of Graves (Figure 2.2) against the recent design schemes of Koolhaas (Figure 2.3), I rely on the assumption, shared by designing architects, that buildings are pragmatically knowable, not symbolic. A comparative analysis of the figurative languages of the three Whitney architects cannot explain

[1]   Fifty-three articles in different newspapers and specialist art journals make up my first corpus of sources encompassing the period between 1956 and 1979, with a major number of publications from 1966 – the year when the museum first opened its doors. The account on the controversies in the 1980s is based on 120 articles in the American press (for the period from 1981 to 1988) and analysis of the archives of the Whitney Museum of American Art (letters of support from architects, museum professionals and the various neighbouring communities).

us the Whitney career. The design of Graves cannot be measured simply in the way he recalled figurative neoclassical architecture using elements from Italian pergolas and palazzo, or the way the Breuer building demonstrated its Brutalist style of modern restraint that was so at odds with the urban surrounding.[2] Similarly, explaining Koolhaas's design as an expression of ultra modernist mannerism does not help us to understand the way the NEWhitney was conceived.

Instead, comparing the design moves of the three architects provides an experimental situation in which both the definition of buildings and the social are being challenged.[3] In this comparative historical enquiry, OMA architects find out different ways of re-contextualising an object in design by adding up new interpretations provided by history, account the buildings' repertoire of action as the controversies unfold, and witness how a multitude of new associations are shaped. Recalling the controversies surrounding the Breuer building and the projects of Graves, architects form OMA gain knowledge about the Whitney building and about its potential to generate and reshuffle the social connections among a variety of new participants in design.[4]

Design process as witnessed at OMA provides an answer of what *a building does* and what it means to extend it, of what the social is and what

2   On the architectural language of Graves and his figurative neo-classical architecture see Norberg-Schulz, 1990; Nichols, 1990.

3   The use of the term design move, instead of design decision, denotes that design venture is led by a variety of experimental assumptions, a number of 'what if … ' queries, which configure a particular repertoire of actions of the building designed. A lot of non-humans take equally part in the experimentation (city regulations, materials, site conditions, museum display, requirements of the art works) and jointly contribute to the design process that does not rely merely on the series of decisions and intentional actions of humans – architects, clients and users.

4   As we know it from studies of scientific controversies (see Latour, 1987, 2005), looking at earlier stages in the construction of facts and machines is more rewarding than remaining with the final stages, because we can gain a better access to the mechanisms by which the protagonists in the controversies (that usually accompany these stages) attempt to transform one another's statements and explain why their opponents think otherwise.

it is made of. Comparing the designs of Graves and Breuer to gain knowledge about the specific Whitney career requires exploring the Whitney projectogram (presented across Figures 2.1, 2.2 and 2.3) by zooming subsequently on the distinctive images.

Zooming on Figure 2.1 we can witness the Whitney of Marcel Breuer. 'Today's structure in its most expressive form is hollow below and substantial on top, just the reverse of the pyramid. It represents a new epoch in the history of man, the realization of one of his oldest ambitions: the defeat of gravity.'[5]

When designing the Whitney building, Marcel Breuer was mainly concerned with what a museum in Manhattan should express, and the question 'What is its architectural message?'[6] In a letter to Marcel Breuer and Hamilton Smith dated 23 December 1963, the associate director of the Whitney stated 'it is time for us to start moving on some new black-and-white renderings or sketches of the building that we can use in our campaign literature and for general publicity'. There is no evidence that Breuer used models to communicate the building's concept. Different audiences gathered around the architectural plans and renderings and tried to guess, bet on and theorize the nature and the challenges of the new building. They followed the construction anxiously, tried to predict the different functions, figure out the future visitor's trajectory, and anticipate the first events. Printed in many copies, plans, section diagrams and pictures appeared on the pages of various newspapers and specialist art journals in the 1960s. The plans were pored over by architectural critics, the museum's neighbours, museum professionals, architects and by ordinary New Yorkers. They gathered around the scaffolding of the building during its construction, and its barely visible granite grey fabric provoked controversial reactions *in situ*.

5   'Upside down museum in Manhattan', *Architectural Forum* (January 1964).
6   Breuer, Marcel, 'Comments at the Presentation of the Whitney Museum Project', 12 November 1963 (see Breuer and Papachristou, 1970, p. 14).

An Upside-down Museum in Manhattan

Two main design moves defined the specificity of the Whitney building of Breuer: 'its upside-down structure' and its 'windowless character'.

Upside-down

Instead of adopting the design of an average building in Manhattan according to the zoning regulations, the Whitney is endowed with an inverted, *upside-down structure*. Its peculiar spatial distribution – 'space below and volume above' – denotes also that the Whitney building has the capacity to act in a different way to ordinary New York City buildings that conform to the zoning requirements and cityscape. What could a building in Manhattan gain from being an upside-down version of the usual skyscraper? Were the plans of the building 'read upside down', as the joke spread by many journalists during the construction process had it?

The inverted pyramid design makes it possible for the building to gain an unusual distribution of space and volume. The upper part, where the exhibition galleries are situated, is made as a stable, almost completely closed off granite zone, while the lower portion of the building remains open and unstable as it houses a spectacular entrance and an outdoor exhibition area for sculptures. This particular distribution allows the building to be always partly open at the level of the low-grade pedestrian plaza with the sunken sculpture court. The entrance, across a bridge, gives views down to a basement sculpture garden, which connects with the basement galleries through large plate-glass windows. It is seen by architectural critics in the 1960s as being an important part of the social experience of museum going.

The Whitney Museum entrance invites pedestrians to look at art while walking along Madison Avenue. With its open-air sculpture garden visible from the avenue, the Breuer Whitney immediately announces its repertoire of actions. It *draws* the visitor into the entrance. Crossing a bridge from the street to the entrance, visitors find themselves in a lobby, where they may

descend a circular staircase to the indoor sculpture gallery and adjacent cafeteria, or take an elevator to three floors of permanent and temporary exhibition space. Almost 30 feet of the total depth of 125 feet at sidewalk level are given over to an open space for pedestrians. With the idea of having a dramatic transition from sidewalk to interior – the bridge – Breuer's specificity is defined by the way it takes the visitor from the mundane affairs of the street to 'the artistic values inside', by the speed with which a pedestrian is transformed into a museum visitor. This is how it becomes possible for the bulky granite construction to be characterized by the critics not only in structural terms, but rather by *what it does* to pedestrians, the street and the city environment. Its impact is measured in terms of the effects it is able to trigger and the way it challenges the amblers on Madison Avenue, receiving them as visitors before they even enter the building, converting them into museum lovers once they are inside.

The stepped-back facade not only allows the sculptures in the outdoor garden to be seen from outside, from the street level, but it also makes it possible for the visitors inside to constantly be aware of the street dynamics. The rhythm of the street could also, therefore, intervene and alter continuously the museum's internal architecture; its dynamics influences the peculiar perception of artworks in the semi openness of the garden space. In this way Breuer's architecture suggests a new format of aesthetic appreciation: 'disturbed' perception. Instead of standing in isolation and silent contemplation, the visitor is interrupted by street noises; her experience is 'polluted' by many unexpected images, and disturbed by the glances of curious passers-by. Both the museum and the street remain open and interconnected.

It is impossible to account Whitney's architecture without recalling the effects the building provoked at the time. Most of the pedestrians passing by the building on Madison Avenue expressed surprise at the structure, and considered it dark, but strangely attractive. Some thought of it as a 'fortress' or 'garage', 'sombre', 'dark', 'severe', 'bulky', 'arrogant', 'forbidding'; they even went as far as to say that the museum should be 'torn down and built again right side-up'. The critics considered it to be 'the most aggressive and arrogant building in New York', 'a strident symphony in stone'. At the same time others thought of it as romantic, striking, quiet and beautiful,

'a thing of joy and wonder', a spectacular Egyptian tomb like the ones in Saqqara, or a romantic moated castle. Some critics defined it as 'a revolutionary building superb for its purpose', 'a dramatic hurrah to the twentieth century', while others criticized it for being too heavy, not sufficiently disciplined and too mannered. It was equally attacked by artists for being too plastic, too powerfully competitive with their own work. Regardless of the tone of the reactions, the building was always judged as a sculptural masterpiece and was defined as something that genuinely raised controversy and triggered criticism. It won an unusual amount of neck craning from passers-by. This 'sidewalk evaluation' made the building look like a living work of art in the street – provocative, shocking, surprising. Therefore, the Whitney was defined through a repertoire of actions reminiscent of those art pieces on display inside. That is what made it *different* from other buildings right from the very beginning. Envisioned as 'a dramatic work of art' when the plans were announced in 1963, as construction was under the way in 1965 the museum already looked to some observers more like a piece of junk sculpture than a building. Critics and ordinary New Yorkers alike were shocked, surprised, challenged, and swept away by the peculiar fabric of the building.

Making the museum look unlike the adjacent buildings in every possible way by building massive protective walls around it, Breuer's design defined Whitney as being at odds with its New York City surrounding. It *added* a building in New York that diverged entirely from the rest of the city's edifices, ruptured urban fabrics and stood at odds with the streetscape and the shapes of other museums. For Breuer, to add a new building to the city meant to disrupt, to break with the past.

The Whitney plans provoked such a high public interest that the museum succeeded in both challenging and agitating the city of New York. It stood against a circumscribed view of a museum, holding that the only important thing is 'what goes on inside'. Built upside down, and thus disrupting the city's standard thin, dull, facile and routine shapes, the Breuer building compelled pedestrians, architectural critics, artists and New Yorkers alike, and provoked a motley assortment of sharp reactions. Liked and disliked strongly by them, the Whitney assembled protagonists on the construction site, in the neighbourhood, in Manhattan, and further afield

in the city of New York and in the Modern art scene. As the controversy developed, a bigger number of actors and resources were mobilized (even actors and resources that are not concerned by design, nor educated to judge design issues) and new associations were traced among them. Gaining more allies and critics, letters of support and complaints, and agitating different city groups, the Whitney building became a full-blown actor. The more people spoke against and in support of this building, the bigger the crowds of visitors and passers-by got; the more the resources and allies locally available increased, the more social did design become.[7] Thus, what Breuer designed in his office in the 1960s, far from Bauhaus and in the heart of Manhattan, was not a new extravagant shelter for modern art pieces, nor was it a new house for living American artists, but a totally new social actor. It emerged with a distinguished design profile, enrolled an increasing number of protagonists, generated startling public effects, and by so doing questioned the very definitions of museum, art display, and city dynamics.

No Windows

Another important design move that differentiated the Whitney was its *windowlessness*, which allowed the museum to gain the maximum amount of exhibition space. Only a few carefully angled windows were kept in order to establish a connection with the city of New York outside. They were monumentally three-dimensional and slant rather than flat, designed according to the many horizontal and vertical lines in the building's overall geometry. Their projections cast interesting triangular shadows over the outside of the building and were meant to follow the movement of the sun.

'A museum needs walls', Breuer argued, 'not windows'. With only a few windows, displaced from the side of 75th Street, the rising structure of the

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7   As we know it from science and technology studies if a fact or an artefact gains more allies and supporters (see Latour, 1987), and relevant groups (see Bijker, 1995), it has a bigger amount of linkages, resources and allies locally available; it is more social. The same is relevant for design projects.

new building was said to suggest a cramped sense of inflexible enclosure. If windows had been added to the Whitney they would have taken up much needed space and distracted attention from the art on display; they would have also brought in coloured light reflected from buildings outside. Yet the 'correct' lighting for paintings was implicitly considered by the Whitney designer to be neutral. If a 'disturbed appreciation' was thought to be the most applicable in the case of the sculptures in the sunken garden on the lower level, the design of the upper galleries suggested that paintings need an isolated and undisturbed milieu in order to be viewed successfully. A windowless exterior meant more hanging space for artworks and a quiet, isolated and serene environment for 'uninterrupted appreciation'.

The windowless building was considered for a long time to be too forbidding, almost a 'jail'. Yet some of the many disappointed observers changed their minds in 1966, the opening year. The reason for that change was the fact that many new non-human actors, which had not been taken into account up to that moment now entered the equation: the galleries' interior, lighting system, movable partitions, flexible internal space, furniture, materials, and textures. These all became apparent as soon as the museum was completed and its interior became visible to critics and visitors. 'Although it has a prison look from outside', a journalist wrote in 1966, 'once you are inside the Breuer building presents itself as a logical, clear, inspired solution to the problem of making huge beautiful gallery spaces'. He concluded: 'it is one of the most handsome interiors in America'. This discrepancy between outside and inside was also a specific architectural challenge: the shock of the outer appearance of the building made possible that visitors were pleasantly surprised upon entering – and consequently they re-examined the exterior with fresh eyes. A windowless envelope framed a space entirely closed off and isolated, dedicated exclusively to paintings. Endowed with controlled ventilation and a lighting system, it gained greater independence. But what made a flexible interior possible was the stability of the architectural envelope[8]. As a result the museum

8   I use the term architectural envelope (in relation with museum content) following the philosophy of spheres of Sloterdijk (2005), to designate that the building exterior

was not treated as a static container of objects; it was rather defined as a flexible mechanism that would facilitate a distribution of spaces to serve the needs of various exhibition programmes. If the exterior competed with the art so as to entice people into the building, the interior did not dare fight with the art. Instead, its neutrality made possible multiple material transformations to create conditions conducive to the exhibiting of art, which would not be drained of life by the surroundings.

Unexpectedly in view of the bulky, static and closed appearance of the grey granite structure as seen from outside, the inside is extremely dynamic and follows a particular rhythm. Beams and columns are used to divide the space into galleries, fixed or changeable. Thus small and big rectangular spaces are shaped to accommodate both permanent and temporary exhibitions on the same floor. The organization of the internal space is also inverted like the building: it is the ceiling that becomes centre of gravity and a main support structure more so even than the floor because that is where the mechanism for changing the museum space is incorporated. The suspended ceiling is a 2×2 foot grid of smooth precast concrete modules, which incorporate the lighting strips and the track ways for the system of movable exhibition panels. In this way it conceals at the same time utility lines, air grilles, and sprayed acoustical materials. The channels in the concrete grille can take specifically designed lamp housings that can be plugged in virtually anywhere and which cast a directional light upon the exhibition panels. Walls are movable; light is altered and adjusted in a flexible and doorless space. In this configuration, when only the floor acts as a given condition, the Whitney gains a flexible interior space. The mobile lighting grid on the ceiling is meant to relieve the monotony of the walls, which

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shape is a fragile 'wrapping' that shapes and reshapes its contours according to the intensity and the dynamics of the interior life of the building. Its shape corresponds to the temporal structures of domesticated existence. Rather than being a stable and unchangeable container of content, the architectural envelope is a way to understand the interior life of the building as it offers the possibility of its 'anatomic' exteriorization. It denotes that the exterior shape of a building is the product of the interior, and an intensive building life (like the Whitney's) has the potential of shaping a number of infinitely diverse shapes.

apart from the texturing are quite bare. Many contrasts work together to break up the monotony: smooth marble follows poured concrete as one passes from one room to another; fixed rooms with carpeted floors succeed empty spaces that are entirely changeable; the predominant materials of stone, concrete and ornamental bronze are finished with hand-made interventions. These contrasts bring together people, furniture, paintings and space in a state of flux.

Since the movable partitions allow multiple intersections, devices for lighting and wall suspension, the museum can be spatially rebuilt for each show. It allows curatorial virtuosity and new ways of mobilizing a variety of non-human actors. Thus through its very interior design the museum lends its fabric to the unexpected adventures of art. It is an entity that can be reshaped many times; the exhibition is the occasion for new actors to be enrolled and re-assembled together and new associations to be shaped, defining both museum and exhibition through design tools. The architecture provides a tool kit for curators, museum workers, and visitors that allows them to reshape the setting anew. Walls, light, ceiling – everything in the Whitney's three main galleries serves the art on display. Wall surfaces of white-painted canvas, bush-hammered concrete and floors of split bluestone provide a setting that is 'neutral, but not cold and clinical like most modern galleries'. With Breuer's concern for comfort – earthy materials and adapted furniture (deep chairs and banquettes) – the building is more like a warm and human 'private mansion' than a cool, antiseptic and 'anonymous public treasury'. The critics even classified it as 'the country's least fatiguing art museum'.

It is not only the museum that gains an ability to reshape its external envelope: American art itself gains a greater flexibility, enabling its diverse topics and current tendencies to be presented. Only through the many movable panels and lighting variations can various viewpoints, ranging from the traditional to avant-garde, be exposed under the same roof. The many distinct little spaces in the galleries allow different art schools and artistic statements to be presented. The changeable spaces are able to accommodate the diversity of something that is in constant motion, whose standards are not fixed and immutable, whose dynamics are ever-changing, whose value is in the process of becoming, whose audience likes

to be challenged by novelty. That is, American art of today. With such a flexible architecture entirely subordinated to the art, it has the chances to become a 'barometer' measuring the dynamics of American art. This is how the Whitney architecture was able to facilitate, help, afford, and promote the phenomenal expansion of American art, not only in the number of artists, but also the dimensions of their paintings and sculpture, and the size of their audience.[9]

For a long time thought of as a 'provincial reflection of European art', American art was now given the chance to become independent – endowed with a strong architecture and recognized internal diversity. With its new building, standing autonomously, having weight and an independent and self-reliant profile, enriched with new types of functional spaces (such as an auditorium and library), the Whitney museum was well equipped to enhance to a greater extent its role as a promoter of living American artists and become a major institution for scholarship on American artists. It engaged in publishing, research and collecting activities, and raised money to purchase new artworks in order to represent younger artists and sponsor their work. A rising number of artists meant a mounting number of paintings that only an expanding building could accommodate. In this way both modern art and its architectural envelope were redefined and historicized in the design controversies.

That is how, the Breuer Whitney grew and defined itself through its peculiar design to the extent that its meaning could not be deduced solely from the context of the 1960s, from stylistic patterns and causality. That is the reason why, instead of plunging in the archives of Breuer, the scholarly

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9   For instance, the first exhibition in the Breuer Whitney blurred the distinctions between the separate compartments of art history and presented instead a continuing flow of ideas. From floor to floor a fluid display unfurled, in which realism, impressionism, expressionism and subsequent movements all melted together, thereby fighting the rigid art historical categories and enabling the visitor to traverse periods in a non-linear and non-chronological way. The opening show in the Whitney, 'Art of the United States: 1670–1966', displayed an arbitrary assemblage of paintings, an a-historical presentation that made the most of the many curious juxtapositions *facilitated* by the museum's dynamic architecture.

literature on international style, or in books and archives explaining the political and cultural circumstances in which this building became possible, what architects from OMA found more relevant to their current design enquiry was rather to decipher the distinctive design moves of Breuer and how they related to the questions of what a building does, of what it means to design a museum for living American artists. Inverting the pyramid structure, opening up the building in its lower part, constructing a windowless museum, having a flexible internal display – all these conditions taken as design moves, not as symbolic language, created an experimental situation in which all the protagonists in the controversies surrounding the Breuer design were redefined and gained new skills. If the museum was first defined by its inverted structure as an entity that challenges visitors, sweeping them away from the entrance, provoking them, and converting them into art lovers, the second design move – the windowless building – challenged not only the visitors but also a variety of non-human actors such as ceiling, sculptures, movable partitions, lighting, and the museum display. Marcel Breuer went through his own challenges at the hands of journalists, public authorities, neighbours and visitors, but both designer and museum gained new 'competences' and meanings through the design: the architect gave the museum the appearance of an ever-surprising entity that has almost frightening plasticity, keeps up with the rhythm of changing artistic trends and lends its architecture to the dynamics of the content, while the museum helped Breuer to gain popularity and recognition as the architect of an emerging New York landmark.

In these trials the Whitney museum demonstrated its power to operate 'contextual mutations' (Guattari, 1994) and tracing new associations among pedestrians, museum goers, living American artists, architectural critics and the city, played as a social actor. It provoked profound transformations of many of the facets of its urban environments, generated different reactions and reinvented entire bonds of contextual relationships. The inner logic of the Whitney building – its capacity to provoke, drive the visitors from the street, isolate paintings and provide a lively environment for sculptures, divide or connect display units, facilitate or hinder communication, endorse different types of aesthetic appreciation – could explain some features of

what made these associations last longer and extend wider, i.e. what made the reactions against the Whitney so intense.

A Decade of Design Controversies

In October 1981, following six months of interviews with more than a dozen architects, Michael Graves was hired by the Whitney Board of Trustees to produce a schematic design for an addition to the Whitney Museum. In the spring of 1985 Graves presented his initial drawings and models to the Building Committee and argued that the task of adding to such a 'modern monument' as the existing Breuer building was 'a struggle and an incredible challenge'. Commenting on the selection the Whitney director Thomas Armstrong said: 'We chose him on the basis of his past work and his approach to the problem. We didn't go to an architect of Breuer's generation, nor to one who had done building designs in New York. We wanted an architect who would try to make the new building as important a contribution to architecture as Breuer made with the old. It's very exciting, because we don't know what the solution will be.'[10] As soon as Graves' design was presented to the public it started attracting avid supporters and equally vigorous critics.

While designing the NEWhitney OMA architects follow the specific design moves implied by the proposals of Graves – 'to embrace the Breuer building', 'to expand horizontally', in order to recall his interpretation of the Breuer Whitney. Like them, I will follow these moves and will simultaneously recount the conflicting interpretations of the other protagonists in the disputes over the three extension plans, presented in the period 1981–9. What follows is an account of how the Whitney's repertoire of actions and its social capacities were redefined through the architectural controversies of the 1980s.

10   OMA Archives.

To Embrace the Breuer Building

The isolation of the Breuer building separated from the Madison Avenue streetscape by a moat in front and a high concrete wall running alongside and the utterly different adjacent brownstones turns to be an 'agonizing problem' for the architect assigned to design an addition, for no extension can truly respect the sculptural monumentality and 'autism' of the Breuer building. The mission was so thorny because the fundamental integrity of the Breuer building would be violated by adding anything at all to it; in a way, extending this building meant doing something in an anti-Breuer fashion. That is what made Graves' task so difficult. 'It is a particular challenge for an architect', argued Graves in an interview. To respond to this challenge Graves suggested a similar architectural move to the one proposed by Breuer – to integrate the anti-urban Breuer building into an ensemble that inevitably remains very different to everything around it. Critics suggested that Graves intended to maintain the hostility of the Breuer building towards its surroundings.

Graves' first design proposal from 1985 was to adjoin and balance the original building with a mass of similar size and scale on the southern half of the Madison Avenue block (Figure 2.2). Instead of building a small tower above its own addition, leaving the Breuer building completely alone, Graves' solution was to expand more horizontally than vertically, around and above the existing Whitney, embracing it. The neighbourhood zoning laws left it with no option but to build both next to and above the Breuer building. In order to create a composition that integrated the Breuer building Graves designed a central hinge that could both separate and relate the old and the new, and which assured horizontality; the knitting together of the two portions was plastic, creating an equal accommodation of past and present. Whether the proposed extension was an artful integration of the Breuer building giving the entire ensemble a feeling of architectural unity, or a structure that threatened its very existence would become a topic of passionate discussion over the course of the following decade. In these controversies, many new protagonists were enrolled, a variety of new associations were established through design, new definitions of what it means to extend a building were gained, the Whitney's

architecture and mission were reappraised and American art and museum display were redefined.

As soon as Graves' first plan was revealed to the public (and the first scale models were shown), cries and controversies broke out. Some critics defined Graves' solution as a courageous architecture route, and his design as both daring and sensitive, powerful and subtle. However, most of the critiques remained negative and tensions escalated as the plans were developed. Graves was accused of copying his other buildings, and of ignoring the 'poetry' of the Marcel Breuer building. His design was interpreted as an attack on Breuer's minimalism, and as a plan to usurp rather than expand the Whitney museum. The architect was accused of 'monumental egomania' and the extension was treated as undermining and neutralizing the original structures. Since it 'clawed' and 'chewed' at the Breuer building it was even described as 'an act of urban vandalism', an urban assault, aggressively hostile and arrogantly vulgar, an attempt to 'package' the old Breuer building.

Although the expansion was regarded by the critics as a 'mammoth extension', too bulky and totally overwhelming the Breuer building, Graves' design kept several aspects of the Breuer building intact. Responding to the objections that Breuer's building would in effect be swallowed by his design, Graves pointed out that his plan would preserve virtually the whole of Breuer's facade intact, thus interpreting the facade as the most important architectural element of the Whitney. This is what Michael Graves meant by having a respectful attitude towards the Whitney building. In addition, the main features of the original museum were preserved, especially the interior where the galleries were to remain essentially unchanged, and the feeling of solidity was maintained.

In the extension the dark grey granite mass of Marcel Breuer's building was supposed to coexist with the pink granite base of Graves' addition, the upper stories of which would span both structures on Madison Avenue. What strikes one first is the contrast between the two architects: 'It would be hard to name a contemporary architect whose aesthetic is more opposed to Breuer's than Michael Graves – his polychrome palette and his taste for historicizing detail seemed certain to fatally *diminish* the original building',

argued a journalist.[11] This co-existence of disparate structures, of Graves'
'historicizing ornamentation' and Breuer's 'minimalist restraint' was con-
sidered to be an odd attempt to 'trivialize the Whitney' and 'epitomize its
stark, almost brooding seriousness'. Graves considered the colours in his
design to be compatible with the spirit of the Breuer building, and saw
them as a vital component in establishing reciprocity. Yet it was the con-
trast in materials and colours that, according to some critics, jeopardized
and even endangered the Breuer building.

The controversy tended to focus predominantly on the merits and the
appropriateness of Graves' design. The original Whitney was reduced to an
element within a larger composition, in which a massive boxy cube balanced
on the Breuer building and where the old building was controlled entirely
by the new addition (as compared to the status of the Breuer Whitney in
the ensemble proposed by Koolhaas, where the Breuer building was one
of three equal standing objects). In the Graves proposal the brownstones
were transformed into a piece of history and were employed in the new
composition by evoking the demolished brownstones, thus using histori-
cal forms inventively rather than literally. The critics considered that the
meaning of the Breuer building in the composition was somehow altered,
because it was no longer asymmetrical in itself, but part of an essentially
symmetrical ensemble. In contrast with Graves, proposing a composition
of three different elements the OMA design (Figure 2.3) kept the asym-
metry and remained more 'faithful' to the initial Breuer compositional
principle.

The Breuer building remained an important concern in the three
design plans. It was 'more respectfully' treated, argued the critics, in the
second Graves scheme (1987) in which the extension was scaled down,
and was therefore made less confrontational. Presenting the second ver-
sion Graves stated: 'Its composition relates sympathetically to the existing
museum.'[12] The third expansion design (1989), created over the period of

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11   Filler, Martin, 'The Sum of its Arts', *House & Garden* (v. 157, August 1985), 80–1.
12   'Revised Expansion Plans', announced by the Whitney Museum of American Art,
      10 March 1987, Whitney Archives.

five years, was 'more reserved than its predecessor' and was described by the museum director Thomas Armstrong as 'preserving the singular force and visual integrity of the Breuer building …' Even though the proposals were subsequently simplified, Graves' design was strongly criticized as being unable to step back and take 'gentlemanly second place', as wanting 'to speak even more strongly' than the Breuer. Although the critics qualify the controversy surrounding the Whitney extensions as being 'the most compelling aesthetic battle in architecture', it also raised historic preservation issues and questioned the Whitney as a museum of American art.

Graves' design made it possible for the Breuer building to be redefined. Considered endangered in the disputes surrounding Graves' architectural plans, the 'Brutalist building of Whitney' gained public recognition and a level of fascination it had never attained before. The feelings of mass, of solidity, of sculptural integrity were thought essential to the Breuer building's architectural identity. Graves understood these to be the main features of the Whitney, but the critics thought it would be impossible to preserve them in a design full of classicizing details. The public and the architectural community considered the extension to be a threat to the Breuer building, something that would eclipse its freshness and mystery and would transform it into a 'mannered cornerstone', whereas Graves regarded it as being compatible with the spirit of the original design. Because of these disputes the old Whitney building was considered to be as worthy of special preservation treatment as the paintings it housed.

Subsequent attacks included an anti-Graves article by Hamilton Smith, who was Breuer's partner on the Whitney commission, while Breuer's widow, Constance Breuer, stated that she feels indignant at the addition of Graves. Architects in New York City were quick to circulate a petition denouncing the new design and asking for a recall. The petition, delivered to the museum on 3 October 1985, argued that the Graves design would destroy a world-renowned work of architecture. While acknowledging the museum's need to expand, the petition urged its Trustees to develop a strong and important new building that would, at the same time, respect the existing museum. The Ad Hoc Committee to Save the Whitney, which circulated the petition, said the group would organize members to appear at public agency hearings to argue against the design. The architecture

community was split into two groups. Those who loved Breuer's building said its strength and power lay precisely in its separation from, and even defiance of, its context, and argued that this piece from the not-so-distant past should be respected. On the other side, esteemed figures like Philip Johnson, Ulrich Franzen, and Vincent Scully, spoke in Graves' defence, saying that Graves' addition finally gives the Breuer's building a reason for being.

The issue of appropriateness was, in the eyes of American architects, a question of rhythm and synchronization with the city 'composition'. Standing at odds with its context, a hostile and intrusive neighbour, abstract in scale, aggressive in its mass, hiding behind crude concrete barrier walls, the original Whitney building was considered by the architects involved in the controversies as 'crying' for addition. Endorsing Graves' design Peter Eisenman argued that 'the asymmetry, scale and muteness of the existing Whitney was never intended as a finished work; Breuer's building almost asks someone to do what Michael Graves has done.'[13] Most of the architects who joint the controversies surrounding the extensions plans of Graves believed that to add to the Breuer meant completing an unfinished work, improving and perfecting it. In numerous letters in support of Graves, they evaluated the extension plans using a musical vocabulary ('rhythm', 'pulse', 'composition', 'discordant', 'acceleration', 'tune') as if they were judging a symphony rather than a building, as if the city was a piece of music that could be composed anew through a building extension.

Obliterating the staircase and concrete wall of the Breuer building, Graves' design attempted to harmonize two boxy masses: the dark grey granite mass of Marcel Breuer's building, *unstable and crying out to be balanced*, and a mass of similar size and scale with a pink granite base, which was the addition proposed by Graves on the southern half of the Madison Avenue block. This counterbalancing was to be achieved by the central hinge that would mediate between the two granite constructions and would join together Breuer and Graves, old and new, shaping a massive, temple-like structure with a total height of 188 feet. One other means

13   Letter of Peter Eisenman, 19 May 1987, Whitney Archives.

of equilibration was proposed: in contrast to Breuer, Graves' design re-established the normal setbacks of the building, and its 'normal' shape. While the original Whitney building seemed to be defying the laws of gravity, Graves' architecture emphasized gravity and was positively sub-servient to its laws, opposing the anti-gravitational quality of the Breuer building. Architects argued that the major volume of the Graves exten-sion would *stabilize* the Breuer building 'without draining it of its energy', would '*civilize* that rather barbaric exercise in Brutalism'[14] and *accentuate* 'the modernist intention of the hovering, antigravitational Breuer building by the gravity countered Graves structure'.[15]

A feeling of imbalance was also caused because, according to archi-tects, the Whitney building stands at odds with its surrounding. The two parts of the Whitney block are not only different in scale, style, volume and mass, but the Breuer building is also isolated by a featureless concrete wall, which is almost twice as high as the row of undistinguished brown-stones, and was primary designed to proclaim the museum's separateness from its context. This diminishes even further the row houses, which do not have the strength to balance the overpowering presence of the Whitney building: '... on the Whitney block, the discrepancy between the Breuer building and the existing townhouses is so excessive as to be jarring, eccen-tric, and *discordant*. This kind of fragmentation does not serve the general purposes of the District. With regard to the existing Museum, the addition will make it less of an object that stands alone and more part of an entire street *composition*.'[16]

Thus, the architect-protagonists in the controversy interpreted Graves' design as capable to provide a solution to the problem of disharmony among the buildings in the neighbourhood, to resolve 'a horrendous urban design conflict'[17] and *'fine-tune' the Whitney block front with the rest of upper Madison Avenue*. Dealing with the unfriendliness of the Breuer building,

14   Letter of Roger C. Ferri, 14 May, 1987, Whitney Archives.
15   Letter of William Pedersen, 1987, Whitney Archives.
16   Letter of Alexander Cooper FAIA, 19 May 1987.
17   Letter of Ulrich Franzen, 19 May 1987, Whitney Archives.

particularly at pedestrian level, Graves suggested to 'enliven the facade' and
to make it more active at street level. By incorporating the Breuer building
'into the larger pattern of urban order'[18] the addition could contribute to
overcoming the 'excessive' fragmentation and volume discrepancy of this
district of New York. Suggesting to 'solidly fix the Breuer wing on the street
front by recalling its volume, shape and stoniness in the new wing' Graves'
design could restore the continuity of the urban fabric and overwhelm the
isolation and hostility of the existing building. Some of the architects went
as far as to describe the new wing as 'the mate for which the Breuer wing
has been waiting', thus treating the addition not as a mere appendage to the
extant buildings, but rather as a process of completing and complementing
them in a continuous historical fashion, a process of adding up. Or, as one
architect put it, 'it completes what is presently an incomplete block, and
finishes off the avenue'.[19]

Built in dark grey, unpolished granite, the Breuer building was out of
place among the smaller scales and more elaborate facades of its neighbours.
The materials and colours Graves proposed for the extensions would place
him in opposition to the existing Breuer 'landmark building'.[20] In contrast
to the simplicity of the Breuer grey granite structure, the richly coloured
Graves building was designed in the fashion of abstract classicism, with
ornamented assemblages of pure geometries and variations on classical ele-
ments such as colonnades, pergolas, and Italian piazzas. Some architects
stated that the historicizing ornamentation proposed by Graves stood at
odds with the spirit and the intention of Breuer's 'exercise in minimalist
restraint'. The highly personal adaptation of classical elements to the Breuer
building provoked the controversial reactions of the public. The classical
stylistics was considered to be better suited to a small-scale building, not
to something of monolithic dimensions. Criticism of Graves' addition

18   Letter of Vincent Scully, 14 May 1987, Whitney Archives.
19   Letter of Thomas L. Schumacher, 12 May 1987, Whitney Archives.
20   Although the Breuer building was not officially enlisted as a landmark at that time
      (by the Landmarks Commission), it was repeatedly called a 'landmark building' in
      the interpretation of many protagonists in the Whitney story during the contro-
      versies of the 1980s.

continued, even as the design plans were continually softened in terms of 'surrogate forms' and architectural motifs such as rotundas, arcades, and pavilions.

The colourful mixture of classical elements was nevertheless considered by other architects as fitting in well with the already eclectic mix of Madison Avenue and '*consistent*' with the eclectic nature of mid-town architecture and the variety present in the Upper East Side Historic District. Defending Graves' projects, Diana Agrest stated that 'the scale and articulation of the addition have incorporated the rhythms, varieties and richness of the area without falling into the banality of facile mimicry'.[21] As Charles Jencks argued, 'the colour, material and texture are all carefully, even painstakingly, chosen to pick up the rhythm and feelings of the street, as I think anyone will agree who takes the trouble to study the photomontages Mr. Graves has made.'[22] Since the block-front between 74th and 75th Street had been stylistically ruptured by a Brutalist building, the extension, argued the architects, would make some 'stylistic adjustments'. The proposed design would transform 'a visually chaotic existing condition into a true New York City landmark'.[23] Instead of 'institutionalizing the Avenue'[24] the decorations suggested by Graves could provide a rich pedestrian experience worthy of upper Madison Avenue and its diverse stylistic context. Architects argued that the proposed extension fitted into a complex city fabric with fine musical undertones, understood as composition, harmony and accord. Graves' proposal was perceived as capturing the city's rhythm, and attempting to harmonize its texture. Writing in defence of Graves, many renowned architects of the 1980s called the design 'urbanistically dramatic' and 'responsive', and judged his approach as possessing sensitivity, sophistication, brilliance, finesse, excitement, and civilized quality, and his building as spirited and handsome.

21   Letter of Diana Agrest, 12 May 1987, Whitney Archives.
22   Letter of Charles Jencks, 12 May 1987, Whitney Archives.
23   Letter of Robert Siegel, 4 May 1987, Whitney Archives.
24   Letter of Robert L. Bien, AIA Architect, 14 May 1987, Whitney Archives.

In this harmonious new composition, the main concern appeared to be 'not to menace the Breuer building'. Improving the existing building, complementing it while maintaining the symmetry, Graves extension plans were partly an attempt to 'tame' the Breuer. However, in contrast with the critics, architects argued that Graves' designs would enhance and preserve the original Breuer building and honour it as the predecessor, respecting its distinctive features within an impartial surrounding. They even claimed it *'dignified the Breuer'.* Even John Burgee, the architect who failed in the competition to design the Whitney extension, was now defending his former opponent by noting: 'I think the Graves design has been most sensitive in making its own statement, certainly unlike Breuer would make, but carefully integrating the original building into the overall design.'[25]

If Breuer made the Whitney museum look unlike the adjacent buildings in every possible way, and for him to add a new building to the city meant to break urban patterns, to differ from the New York City surrounding, twenty years later Graves regarded the extension as demanding to be 'sympathetic' to the old Breuer building and made an attempt to fit it harmoniously into 'the eclectic mix' of Madison Avenue. If, for Breuer, to add a building to New York City meant breaking symmetry, for Graves adding to the Breuer building meant re-establishing symmetry, making it become a part of a well-balanced equilibrated ensemble, synchronising it with the urban rhythms. For Koolhaas on the other hand, to add to the asymmetrical building initially conceived by Breuer meant *to continue* and *amplify* its asymmetry. With the NEWhitney ensemble, in which the Breuer building is one of three equally standing and functionally connected objects, the OMA design remains 'faithful' to Breuer's compositional principle. If Graves' design engaged in a process of drawing to a close an unfinished work by joining old and new with the hinge, Koolhaas's design reproduces the incompleteness of the initial composition. Adding to Breuer meant for Koolhaas 'to do like Breuer did', instead of seeking (as Graves did) to repair the 'deficiencies' of Breuer's architecture.

25   Letter of John Burgee, 19 May 1987, Whitney Archives.

For Graves 'respecting' the Breuer meant preserving features of the original museum: the Breuer facade, the interior of the galleries, and the feeling of mass and solidity. In contrast with Graves, Koolhaas's design reinvented entirely the notion of 'respecting' the old Breuer – by identifying connectivity, circularity and verticality as those distinctive features that made the building work successfully in the first place, and retrieving, detecting, integrating, and relating these features in a new architectural working ensemble. Thus, for Koolhaas, adding to the Breuer meant maintaining the way the building worked, rather than the way it looked relying on a definition of what the building does instead of what it means and symbolizes. In both extension cases to add meant *to redefine* the contextual elements and *to continue*, but in a different design fashion because the two architects interpreted the Breuer specificity and repertoire of actions differently.

More groups joined the controversy. The hope that 'a sizeable building will be designed that is appropriately *respectful* to Marcel Breuer's important architecture,'[26] was expressed by the museum professionals in their numerous letters of support. They considered Breuer's Whitney to be a great achievement in architectural history, unlike many of its neighbours. Museum directors from all over the country judged the design as being sensitive to the original building, and appropriate for the needs of the museum, drawing parallels with other Graves projects, such as the Newark Museum in New Jersey, without commenting on his particular architectural plans for the Whitney extension. Most of the museum directors expressed the belief that the expansion of the Whitney onto its adjacent property would create a 'new architectural heritage to be cherished by the future' and that fifty years from now the Whitney controversy would appear remarkable 'for the vitriolic nature of the public statements made about Graves' design'.[27]

Many neighbours raised objections to the first proposal because they believed that the size of the addition was too large and would overpower

26   Letter of Mitchell D. Kahan, director of the Akron Art Museum, 12 December 1986, Whitney Archives.
27   Letter of Jacquelynn Baas, HOOD, 2 January 1987, Whitney Archives.

the narrow stretch of Madison Avenue around 74th and 75th Streets. They argued that the extension would overwhelm neighbouring shops and buildings, blocking the view of nearby apartment owners and destroying the architectural integrity of the Breuer. The Ad Hoc Committee to Save the Whitney had been co-operating with neighbourhood groups such as the 75th Street Block Association and the Friends of the Upper East Side Historic District. Since the area was a magnet for discarded household objects and other junk, some of the neighbours said they would be happy to have a museum if it helped to discourage fly-tipping, but at the same time they were aware of the fact that a museum might bring buses, crowds and litter into the neighbourhood. Overall, though, the neighbours took into account the eventual positive impact that such a modern museum addition could have on the neighbourhood.

Aware of the public criticism aimed at the first design, the Trustees of the museum withdrew the proposed project early in 1986, and responded to the protests of neighbourhood and civic groups by initiating a revised plan. Over the next few years Graves revised and refined his design, working closely with the Museum staff. Sent back to the drawing board, he produced a different design for the Whitney – scaling it down, slimming it, adjusting it with the community's concerns in mind. As a chastened client, the Whitney Board carefully consulted appropriate community groups in the preparation of the second plan. Architect and client took into account the many different concerns of community and city groups and incorporated them into the design. For example, in the second scheme, Graves considered the concerns surrounding traffic, garbage and pollution and changed the plans for the loading dock that was supposed to alleviate some of these problems. Announcing the scaled-down version, the director Thomas Armstrong, argued that: 'The difficulty was to maintain the integrity of the museum programme and of the extension design and at the same time to respond to the community problems.'[28] 'It's heartening to know that there was a response to concerns raised by the community',

28   OMA Archives.

said Edith Fischer, chairman of the committee of Community Board 8. Commenting on the scaled-down proposal, Martin Filler argued:

> There is always a risk in sending an architect back for an extensive reworking of a proposed scheme. Since the architectural design process is one of the most rigorously evolutionary in any art form, the presentation of a final project, especially for a major public building, is certain to represent a high degree of *refinement* of ideas, strategies and solutions that have been evaluated, rejected and only then *accepted* after a very great deal of prior thought.[29]

The process of 'refinement of ideas, strategies and solutions', and finally of acceptance of the building design, required the neighbourhood residents and civic leaders to meet with museum officials several times as the revisions were being developed in order to encourage and approve the plans. People reacted emotionally for and against the huge Graves addition. Their opinions were so strongly expressed that, as one critic has noted, 'the stones were speaking through people'.[30] The publication of every new Graves design in the architectural press was inevitably followed by indignant letters to the editor from citizens, museum professionals and architects. They all played an active role in the process of reshaping the building and scaling it down. The design changed according to their demands, needs and fears, and this made them active 'co-designers' of the building along with the architect and the Whitney Museum. Following the 'firestorm of controversy' that engulfed the first design plan, the building's immense size was then subsequently reduced. Every new design plan began a slow and painful journey through a multitude of city committees – a long process of approval, in which the public and architects had to come to terms with each other and together reshape the building according to their mutual concerns. In some cases, for instance, when the design projects were presented to clients and proto-users, OMA architects also did 'like Graves', integrating the concerns and evaluations of these groups, going 'back to the drawing board' and modifying the design proposals accordingly.

29   Filler, Martin, 'Growing Pains', *Art in America* (July 1987), 14–21.
30   'Museum Piece. Joseph Giovannini on Architecture', *Artforum* (May 1987), 2–6.

The strongest support for Graves came from the Whitney's director Thomas Armstrong. The museum staff defended the project, because they were convinced that the right thing to do was just what an earlier Whitney Board had done when it selected Breuer – to entrust the museum's future to the cutting edge of architecture excellence. They wanted an architect who would make the new building as important a contribution to architecture as Breuer's original; they believed that another 'architectural masterpiece' should house the Whitney collection. Only two members of the Board of Trustees had doubts about the expansion. The other twenty-three members stood behind the plan, and were provided with a two-page summary of useful facts and arguments which they could use as verbal ammunition at parties and other gatherings, where they were frequently asked to explain why they wanted 'to spoil the Whitney'. In retrospect, some of the Trustees agreed that it was a great mistake to present Graves' design to the public mainly in the form of elevation drawings, since the public was not able to understand elevations and did not realize that the building would look different when seen from the street. Graves himself remained tenacious *vis-à-vis* the critics; on several occasions he presented his design publicly, and took a great deal of hostile criticism gracefully, incorporating the concerns into the subsequent proposals.

Thus, Graves' design move to embrace the Breuer building initiated a series of trials in which the Breuer building was defined anew fifteen years after it was built. Greatly disliked and disparaged by the public in the early years of its construction, it was now, in the 1980s, regarded as a beloved Manhattan landmark, and gained an unprecedented number of partisan supporters. As compared to the controversies surrounding the design of the Breuer in the 1960s when we saw a number of architectural critics, artists, pedestrians, museum goers and New Yorkers express opinions of support or protest, surprise or admiration, in the 1980s the variety of protagonists who enrolled in the controversies increased: new actors joined the discussions (like the museum professionals, the museum staff, The Board of Estimate, and even the widow of Marcel Breuer), while others formed different groupings (the architectural community, the neighbours and the Board of the Trustees were split by disagreement into separate groups). As a result the Whitney design divided more strongly the communities concerned, swiftly

regrouped actors in unpredictable ways, and reshuffled many established definitions. By so doing, it progressively increased its social capacity and provoked effects that spread over time and changed the quality, size and durability of the connections among the actors. As more letters of support and protest were sent, more petitions were signed, more city groups and commissions joined the controversies, more reports were written and more revisions of the architect's drawings and plans were made, the Whitney building created new bonds and its design became more social.

To Expand Horizontally

An extension adjacent to the old Breuer building and connected by means of a central vertical cylinder would unify the existing building and the addition, and would allow a horizontal museum space. By choosing *horizontality* Graves' design diverged from the principles of the Breuer building: to the vertical distribution of spaces in the original Whitney was opposed a structure, which facilitated horizontally displaced galleries. The programme also required the old and the new sections to be read as one museum, calling for a scheme that would bind together the two halves of the building both in plan and in elevation. Arguing that the museum had to expand if it was to fulfil its function of being 'the leading international institution devoted to American art', the Whitney director Thomas Armstrong endorsed Graves' design. 'It is our intention to present in the permanent collection the development of twentieth-century American painting and sculpture and works on paper,' he argued. 'We will show some works in depth, devoting whole rooms to artists such as Edward Hopper, Alexander Calder, Louise Nevelson, Willem de Kooning. This is not done anywhere in the country, or in the world.' As the president of the museum William S. Woodside stated in the 1980s, the addition would enable the museum to make these works available to both the public and to scholars.[31]

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31 Interview with William S. Woodside, 'Nuovo Progetto Per L'Espansione Del Whitney Museum', *Domus* (September 1987).

This unified horizontal space would provide appropriate rooms and spaces for the public to view a *chronological* presentation of the Permanent Collection. Graves' extension would also allow the museum to have its collection *on continuous display* (instead of having on view less than one percent of the Museum's holdings) and to supply a long-sought space for a full-scale installation showing the development of American art since 1900.[32] If we were to draw a diagram showing the path a work of art would take from the loading dock to holding storage to gallery, the result would be graphically interpreted in terms of linearity and logical sequences.

In this extended architectural ensemble the old Breuer would be transformed into a Kunsthalle, while the new wing would hold the permanent collection. While the distinctive appeal of the existing Whitney seemed to be its smallness, its easily negotiated galleries and relatively modest exhibitions (only seventy-two works from its Permanent Collection could be displayed) the Graves addition was supposed to provide larger galleries, which would host approximately 350 masterworks by renowned American artists (most of the Whitney's permanent collection of 1766 paintings and 707 sculptures would still be confined to the warehouse, however). In the new scheme, the most flexible, engaging exhibition space would remain the great fourth-floor gallery of the Breuer building, which was recognized as one of the premier exhibition spaces in New York City.[33] By transforming the Breuer into a venue for temporary exhibitions and events, Graves interpreted the old building as being flexible, a space that could be reshaped many times according to the museum content, while the new portions were designed to be more stable and predictable. Combining two types of display

32   The first design proposal figured out 40,000 square feet to be dedicated to new gallery spaces, and 8000 square feet to be allocated to the permanent collection. In addition, there would be 15,000 square feet available for offices, and 13,500 square feet for commercial space along Madison Avenue, including an expanded theatre, library, and study centre, and a new restaurant.

33   An alternative suggestion was to consider the opening of a new Whitney on a less difficult and controversial site, keeping the present one as Kunsthalle for temporary shows. But the museum director and the staff insisted on having one *integrated* Whitney.

the expanded building would be able to seize two distinctive rhythms in the development of American art. Thus, for Graves adding to the Breuer meant redefining it entirely to the extent that the original Breuer concept was radically altered and its verticality was transformed into horizontality, while for Koolhaas adding to the Breuer meant sustaining carefully its initial way of working, continuing and re-enacting its verticality. Extending meant for Graves converting the old into new to host new programme, while for Koolhaas the old became even older.

The 1960s' Whitney Museum was little more than a windowless box with white open spaces, in which nothing was supposed to interfere with the art itself, least of all the architect. With this anonymous all-purpose interior the Breuer building focused attention on the seriousness of the museological enterprise and did everything architecturally to make the building disappear behind the exhibitions, while Graves suggested a more playful attitude to art and made the building visible at every step of the visitors' experience. The use of terracotta and marble, and painted walls instead of plain white, would help to create distinctive internal spaces, using a palette of soft, muted colours. This, according to Graves, was the only possible way for creating value. In addition, there would be a highly evolved repertoire of wall forms and a complex decorative system for their surfaces. In short, this would be a building saturated in different colours and forms. Composed as a sequence of finite spaces, clearly bound with fixed walls running along axes or focal points, the extended Whitney would be in Graves' interpretation an artistically strong building, a building that could take part in the art world. Thus, both Breuer and Graves believed that the Whitney should offer comfortable and pleasurable spaces for viewing art, but each proposed a different means of communication between the museum's architecture (the architectural envelope) and the artworks on display (the museum content). While Breuer defined the museum as a container subservient to the works of art, Graves interpreted it as an envelope that takes part in shaping the artistic content.

Graves' design schemes also gave rise to a controversy over the function of the museum institution. The extended Whitney would have a new study centre and library, permanent collection storage and support, exhibition support, public facilities, staff offices, and building management.

This would mean that endowed with these spaces, the expanded museum would diversify its palette of activities and public functions: not only to exhibit, but also to conduct scholarly research and interpret the best of twentieth-century American art, as well as to provide spaces for the study of works on paper, for conferences and meetings, performances, lectures, and symposia. This would give the visitor a much more rounded museum experience. The questions triggered by the extension controversies touched the very nature of the museum institution: should the museum try to be a community centre as well as a research institution, a place of entertainment as well as a temple of high culture? Is public education part of the museum's job? As a result the museum was defined in the controversies surrounding the design of Graves as a multifunctional institution.

Simultaneously debated was the very nature of American art and its shifting role in the world. When the architectural plans were submitted the museum's programme underwent also a thorough re-assessment in the press and was widely disparaged for privileging visual spectacles. The Whitney's policy in the 1980s, according to its critics, was to show trendy rather than serious art. 'Trendy', meant that the Whitney experimented with different mixtures of art, video and film, played with a lot of electronic installation effects, and made a palpable effort to feature emerging art; it also exhibited forms of art that possessed some of the kind of 'entertainment value' found in popular culture. The Whitney biennial programme was judged to be degrading.[34] However, as the museum suffered serious budget and operational problems, it explained that by 'putting on the most interesting shows' they could raise more money for the museum's expansion.[35] The

34   Even the intention of the Whitney to become 'major centre for scholarship in America' was regarded by the art critics at the time as ridiculous and the institution as unable 'to serve the interests of either art or its public' (see Kramer, Hilton, 'The Whitney's new Graves', *The New Criterion* (September 1985), p. 1).

35   Whereas the main museum was tuned exclusively into the greatest hits of modern and contemporary art, the branch museums were seen as addressing important subjects without giving them proper treatment, and were therefore criticized as being unable to make meaningful statements.

architectural controversy also helped the museum to re-assess its strategy for dealing with the Whitney's permanent collection.[36]

Whitney's director Thomas Armstrong was strongly criticized for having lost contact with the history of American art and for managing too many superficial exhibitions of 'meaningful American artists', as well as for lacking a substantial curatorial presence. He was fiercely attacked for following a 'quickie-show-and-tell' approach while missing the opportunity to conceive an in-depth programme to explore the history of American art, and to undertake serious scholarly exhibits.[37] Armstrong's supporters argued that he had made systematic attempts to show work of high quality that was not presented anywhere else, and praised him for his commitment to the present. Yet, one of the reasons the Board of Trustees asked Armstrong to resign in 1989 was considered to be the 'frustration' with delays in the Whitney's expansion project, to which he was heavily committed.[38] The design move of Graves to expand horizontally provoked a large number of

36 Some deficiencies in the collection were pinpointed in the controversies surrounding the extension plans, and it was judged to be lacking in some important areas, such as early Abstract Expressionism. Critics also argued that the Whitney was lamentably late in recognizing Jackson Pollock, Willem de Kooning, and others from the first generation of American artists to achieve international renown, and until 1968 the museum took relatively little notice of Pop art, Minimalism, and other contemporary developments. It was also argued that the museum had to show American art in relation to the art of other countries, especially in respect to its relationship with European art. It should not restrict its activities to New York, stated the critics, since 'America is not Manhattan', and the museum should take into account the huge variety of social and ethical issues that preoccupy artists across the country.

37 Scholarship meant for the critics more shows with critical displays, instead of sensational effects, relating the present to the past and making more meaningful statements about the course of art during the twentieth century; it also meant profound studies, original thoughts and publications. For instance, the big show 'Image World: Art and Media Culture', organized as a survey of media-based art, was criticized for ignoring the social and cultural conditions that prompted the art.

38 This was the moment in the museum's development when the Trustees began to control the professional aspects of the museum. This triggered a controversy over art and censorship. Many other museum Boards, directors and staff subsequently experienced problems similar to the Whitney's and had to make hard decisions (see

reactions and further disputes among the protagonists in the controversies. As a result, the Whitney was defined as a multifunctional institution that should merge in a dynamic way the targets of education and serious scholarly research with artistic display, enjoyment and entertainment, its collection and approach to art were re-assessed and its director bore a large amount of criticism.

Recalling this decade of controversies as an important part in the social career of the Whitney museum, architects form OMA, again renounced plunging in the archives of the 1980s or into the vast literature on Graves and post-modern architecture, and found more relevant to their current design enquiry to follow the different design moves of Graves and how they led to new understandings of the Whitney mission, collection and display. The Whitney controversy started as a polite battle within the architectural community in the US and subsequently escalated leading to the redefinition of all the protagonists involved. Every time Graves presented a new plan for the extension, he did not simply propose an expansion of the existing museum, a new object into an old context; he engaged in an interpretation of a variety of contextual elements: the Whitney building, the historical buildings adjacent to it, the city's dynamics, American art and museum philosophy. 'What does it mean to add a building to the city?', 'What does it mean add a building to another building?', 'What does it mean for a museum to grow?', 'What is a museum of American art? – all these questions were raised and thoroughly discussed by the participants in the controversies surrounding the extension plans of Graves. Extending the Whitney meant for all its architects re-contextualizing it according to a long list of sometimes changing requirements and concerns, comparing and evaluating the designs of Breuer, Graves and Koolhaas and their consequences,[39] weighing them against each other, not through the comparative and linear lens of successive styles spanning over forty years of architectural history

'Battles in the Boardroom', *Art News*, 89/3 (March 1990), 59–61; 'War at the Whitney', *New York* (12 February 1990)).

39   In terms of effects and influences, not in terms of aesthetical experience as discussed by Hill, 1999.

('modernists' – 'postmodernists' – 'super-modernists'[40]) but through the number of battles they provoked, the controversies they aroused, the way they shook the neighbourhood, challenged the city, bugged observers, and struggled against circumscribed assumptions of what architecture means. To design an extension of the existing Whitney building meant to redesign it entirely, to reshuffle its history and question its future. What was at stake in these design controversies, along with the numerous structural and mechanical issues, circulation, programme and entrance features, was the way a new design object redefines the associations among a raft of heterogeneous actors. What OMA architects followed when recollecting the distinct design moves in a comparative fashion, was also the changing size, durability and type of these associations, i.e. the building's capacity to act socially.

What Buildings Do

Following the three Whitney architects who traced its social trajectory, one can witness that as soon as a Whitney design plan was announced and the project experienced a quiet historical moment, something happened (a disagreement among various groups of protagonists) and led the participants in design to reopen the 'black box' of the Whitney museum as a design object. Many actors gathered around it; many new disputes took place to determine its shape, costs, connections with adjacent buildings, and to redefine its programme. In every new attempt to redraw the profile of an extended Whitney, in every new design project, in every letter of support or protest against the extension, the status of the Breuer Whitney was modified and new definitions were added.

40   According to the style classification of the NAI in Rotterdam, Koolhaas is considered
      as being 'super-modernist' (ultra-modernist).

To redesign the Whitney, every architect was led to reopen the 'black box' of its first design, break it apart and identify all the components, actors and meanings that took part in it and recollect it again. Only because it was opened so many times, the Breuer design was considered good and bad, was liked and disliked, its architecture was praised and criticized, the neighbours were happy or furious, the City Planning Commission was enthusiastic to undertake an extension and then rapidly changed its opinion. In the extension trials the buildings changed subsequently their meaning, the protagonists in the story changed their opinions and gained new knowledge about design, architecture, museums, and American art. Following these controversies on the basis of selected press clippings and OMA archives, the designers from the office of Koolhaas gained new knowledge about the Whitney and its social career. As they did so, I also closely approached the design controversies, analyzing the protagonists, their groupings and dynamics, and how their statements changed with time. The Breuer building, but also the adjacent brownstones, the Madison avenue streetscape, and the community gained new characteristics and were endowed with new features because they recurrently took part in these controversies and were concerned by the statements of their protagonists and by the processes that reshaped the Whitney. The brownstones treated as 'neglected small buildings' without unique value, once threatened by the demolition plans in the 1980s, happened to be considered in the disputes surrounding the Graves extensions as 'an important piece of historically valuable architecture'. The Breuer building itself, largely disliked by the public in the early years of its construction, gained in the 1980s a greater public recognition as a beloved Manhattan landmark. Thus, Graves' design made it possible for the Breuer building to be redefined and valued again, and even to be considered as demanding special preservation status. Critics in the 1980s regarded it as being 'the most obvious piece in the Whitney's collection of the twentieth century', just as it was considered at the time of its construction to be 'the most important new work of American art of 1966'.[41]

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41   From this moment on the museum has begun 'to collect' extension proposals – a
      noteworthy collection that includes pieces by masters such as Michael Graves, Richard

That is what happened with the Whitney as a design object in the hands of so many architects: instead of extending the existing building, they questioned it and changed many times the interpretation of the Breuer building and its repertoire of actions. Every architect of Whitney added something to the initial conception of the building and pushed its design and urban position a step further. This process of *collective attribution of meaning* made the Whitney history so vibrant and contested that the Whitney building today cannot be explained or identified with any of its designs, but with what every architect added to it, in situations of peace or war, with its entire social trajectory. While designing an extension each architect of the Whitney had to reproduce the old Breuer and its numerous copies generated in the architectural proposals spread over newspapers and journals and in the architectural offices of the designers. They all made the Breuer building present and available through different media. If architects ever stop interpreting and reproducing the Whitney building the very existence of the original Breuer building will be at stake. It is of minor importance that many extension projects have been dismissed; the important fact is, however, that extension trials endure and constitute a stage in the verification of the Breuer achievement. What an extension does every time it is announced and discussed among the actors enrolled in the controversies regardless of whether it is considered a good or a bad design interpretation of the Breuer building, is totally dependent on the possibility of re-enacting the original well or badly. Following the changing interpretations of the Whitney Museum along its social career, architects from OMA realized that an extension is a part of the larger ongoing biography of the building.

Although at all the stages of Whitney's history there were groups trying to oppose the addition, disagreeing with each other and contesting the architectural plans, the Whitney's history witnessed calmer periods in which less actors were agitated by the problem of its inextendability. The discussions quit the public arenas of newspapers, escaped architectural

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Gluckman, Rem Koolhaas, and more recently Renzo Piano. Their design plans have often been defined as 'great pieces in the Whitney collection'.

critics and avoided open protests, and were scaled down to little battles: disagreements within the Board of the Trustees, quarrels surrounding the change of the Whitney director or controversies over its trendy shows. Thus, the building and its potential extendability manifested themselves as being highly *relational* even in quiet periods. They only changed scale, and the Whitney's transformations changed the peace of rate. The act of dismissing a design project was very often the culmination, but also the end of every controversy; the protests calmed down and the controversies flared up. Many humans and non-humans resisted to change their shape or minds in the controversies: the brownstones refused demolition, the Breuer building opposed itself to the overpowering extension structures menacing its existence, the zoning envelope remained recalcitrant to alternative ways of filling and overfilling it, the City Planning Commission, the Board of the Estimate, the communities of neighbours and other concerned groups (museum professionals, architects, visitors) expressed disagreements. As the resilience of all these actors became expressed, visible, and to some extent shared, the controversies slowed down and were subsequently closed (but only temporary). The closure was not reached because one particular statement or group has won over the others, but because all of them have exchanged properties, have managed to learn more about each other and altogether the technical aspects of the design proposals, and thus modified their positions as new actors and resources flocked in design. Thanks to the controversies new associations among them, unpredictable and heterogeneous, were shaped and made visible. The building showed its social character.

  None of the design controversies was solved by merely referring to *the nature of* a historically valuable or modern building, a particular zoning or city-planning requirement, or a 'relevant social group' concerned by the design. As the controversies proliferated, the protagonists were led to open more and more 'black boxes', produced more texts (letters of protests, petitions, and design statements), drawings and models, dug into the archives of the museum and the Landmarks Commission, and engaged in the interpretation of more 'technicalities'. The more they dissented, as we know it

also from studies of scientific controversies,[42] the more new actors were recruited as allies (community groups, city commissions, experts, museum visitors), the more files and papers piled up on the desks of the architects, the Planning Commission and the Board of the Trustees of the Whitney Museum, the more the presentations of the extension plans became technical and endowed with undecipherable for the museum visitors information concerning planning regulations, design aspects and budget figures, and the more they were translated into the architectural press and the daily newspapers.[43] Thus, the design controversies developed and got fiercer when more external allies were mobilized and more technical data about the design was gained, when design became more social. Every time a project was declined the architect's decisions, intentions, design approach and style were blamed for it. Yet, what really failed and caused the project to be dismissed was its capacity to mobilize the humans and non-humans enrolled to consider the importance and to acknowledge the capacity of the Whitney building to gain an addition.

None of the extension projects turned out to be simply architectural in nature: they were also cultural, political, and social.[44] The Whitney

42 On the method for studying controversies in science and technology see Latour, 1987.

43 The heated controversies in the 1960s and 1980s generated numerous technical documents – something that facilitated my research.

44 Architects, like engineers, are socio-technicians, using a particular form of 'heterogeneous engineering' (see Law, 1987). In contrast with social constructivists who assume that the social is *behind* the technical artefacts, and, especially that the social interests offer a satisfying explanation of the growth of technology, John Law argues that the social should not be privileged in the explanation of technology and technological change. The stability and form of artefacts, denotes Law, should be seen as a function of the interaction of heterogeneous elements, more obdurate than the social (natural, economic, technical) as these are shaped and assimilated into a network. Thus, technology is a method for the conduct of heterogeneous engineering, a method for associating and channelling other entities and forces, both human and non-human. The activity of heterogeneous engineering suggests that the product can be seen as a network of juxtaposed components. In a series of articles Michel Callon suggested that architects, too, apply a form of 'heterogeneous engineering' in their practices (see Callon, 1996, 1997).

example shows us that not the time and the context, but *the building makes the controversies*. The settlement of the design controversies cannot be explained by external social, cultural and political factors. OMA's designers were not able to deduce Whitney's architectural career by the contexts of the 1960s or the 1980s. Instead, architects attempted to explain the reactions of different protagonists in the Whitney controversies and the new groupings they formed by the specific shape, size and heterogeneity of the associations traced in design and the ensemble of the connections made architecturally. This led them to understand how approval and disapproval, collective support and violent opposition to design become possible at different stages of a building's career.

Making Visuals, Gaining Knowledge

Figure 8: The Whitney table (photograph by the author)

Rotterdam, Heer Bokelweg 149, the seventh floor. A one-room space, foam everywhere. Walking through the office you see a blue 'landscape' of different-sized foam blocks spread around the tables and bookshelves; you walk to the tables of models and then back and forth among piles of foam pieces, try-outs and models.

What strikes you as soon as you enter OMA in Rotterdam is the omnipresence of models and the particular arrangements of various materials scattered around on tables, bookshelves, boxes, in garbage containers, the kitchen, on the balcony and even on the floor. This ubiquity of foam as an

easy, flexible and tangible working material triggered my fascination from the very beginning. A newcomer would describe this foam world as 'dis-ordered'. After spending many months there, I began to understand that these particular arrangements are meaningful compositions – significant assemblages, able to generate important features of a building-to-come.

In OMA architects work primarily with foam-made models.[1] They spend their time in the models' environment: a design world straddling the borders of abstraction and reality. And so did I, for weeks and months, following the trajectories of the Whitney models and the architects from the Whitney team, conducting interviews, even trying to cut some foam myself in search of a better understanding of the design venture – a process in which the Whitney building would become defined and its extension real and known. As with drawings, foam models at OMA are portable and easy to reproduce and update – qualities which explain their prevalence in this architectural office. Zooming in on the Whitney table (Figure 8), one can discover numerous scale models, always on display and created in conjunction with thousands of drawings and plans, superimposed onto panels, collages, montages and renderings. In this chapter I will follow architects at OMA as they create, scale and modify the Whitney models, and witness the gradual process of gaining new data about the building and its future users. If in the previous chapters I took account of the suc-cessions of design moves in the social career of the Whitney building, here I will track, in an ethnographical fashion, sequences of material operations in design practice. The Whitney building, re-interpreted many times by a variety of protagonists during the controversies surrounding its extension plans (Chapters One and Two), will be considered here as an object that also becomes known as architects produce and circulate visuals.

Though scale models are important tools in architectural design, accounts of the use of models in architecture are not abundant when

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1   In OMA concept models are done *predominantly* in foam, and that is what defines all Koolhaas-signed buildings. However, foam is not obligatory for all projects. Foam was the preferred material for the Whitney project, and several other projects that were realized at the same time, but there were other cases, in which architects preferred to use mainly paper models.

compared with the noteworthy literature on drawings (Porter, 1979; Lebahar, 1983; Blau and Kaufman, 1989; Robbins and Cullinan, 1994; Evans, 1997). At the same time, interest in models has increased tremendously in recent years (Cowan, 1968; Knoll and Hechinger, 1992; Clarisse, 1993; Millon, 1994; Reuther and Berckenhagen, 1994; Kurrent, 1999) as have the interest in collections of architectural models (Schwanzer, 1994; Croy and Elser, 2001). Scale models are often considered to be *expressions* of the internal energies and fantasies of the architect's mind's eye.[2] These theories treat the model as an imaginary mechanism leading to built reality and refer to an *a priori* effort of constructing it; they rely on an idealistic vision of design that assumes a powerful subjective imagination in search of material expressions while ignoring the building.[3] A second corpus of interpretations treats models as valuable tools for *narrating* the building and as *a posteriori* representations meant to represent a complex reality resulting from its examination.[4] According to this understanding, buildings are taken to be defined/completed and models as nothing more than a means of imitating and replicating extant objective reality; yet the architect in the

2   Being a visualization of an imaginary project existing only in the head of an architect (see Clarisse, 1993) models are seen as the most efficient way to translate inherently subjective ideas into physical and tangible prototypes (see Busch, 1991; v. Gerkan, 1994; Croy and Elser, 2001). Design is considered to be a process of transferring ideas from a designer's mind to a physical form (see Porter, 1979) and fixing them momentarily in time (see Porter and Neale, 2000), in a moment of delirium and concealment (see Silvetti, 1982).

3   Following Canguihem, Philippe Deshayes identifies *a posteriori* models, which belong to the order of a representational epistemology, and *a priori* models, which belong to a constructivist epistemology (see Deshayes, 1999).

4   Models collect, articulate and memorize the precise spatial information about a proposed building (see Busch, 1991). They are used to replicate ancient Greek and Roman buildings and are displayed in architectural museums to create a comprehensive overview of architectural history (see Richardson, 1989). Paradoxically, models are both meticulous and stylized accounts of a building: they tend on the one hand to delineate the building precisely, while on the other hand they represent it in a pure and ideal state, without being able to seize time and symbolize style, urban life, and atmospheric qualities, the surrounding buildings or their changes over time (see Ahern, 1979; Busch, 1991).

model shop is forgotten. According to a third corpus of theories, models have an *artistic or conceptual*, relatively independent, *existence* (Frampton et al., 1981), which explains the growing number of attempts by contemporary artists to experiment with models and display them in museums. In this vision references to the building itself and the concrete model-making operations are avoided.[5]

Models at OMA involve aspects of these three groups of theories – they are expressive, narrative and conceptual at the same time. Relying on empirical observation of the routine actions of models' production and use in the design practices of this office, I will focus on the complexity of the experimental and cognitive work carried out through models and will discuss the connection between models and building – something that is paid little attention to by the theories mentioned above. Yet, I do not intend to depict the entire complex and meticulous process by which a model is created. Nor will I attempt to describe all the subtle tricks needed to imitate stone and wooden textures with foam or paper, the metamorphosis of the materials, the instrumental techniques, the invention of new procedures, which would reveal the hidden secrets of architectural design.[6]

Instead, I study the way architects are attached to beings like physical models and visuals, foam cutters and paper plans. OMA designers cannot conceive a building without being assisted and helped by them. And that is what makes them exotic and so interesting. Thus, the smallest inquiry

5   The architectural model achieves a quasi-independent status: 'it is not about representing reality, it's a reality of itself', argues Eisenman. Considered 'miniature dioramas', models are often displayed and appreciated as 'works of art' meant to communicate the ideas of an architect to the public. This has been the main role of models ever since the very first architectural exhibition featuring models curated by Philip Johnson at the Museum of Modern Art in New York in 1932 (see v. Gerkan, 1994).

6   Drawing on the example of the model of the Fallingwater house by Frank Lloyd Wright, Bonfilio shows the complexity of and the virtuosity present in the model-making that was required to produce a particular detail, to achieve for instance the dynamism of the moving water by rendering it with acrylics. He recalls the range of tricks required *to imitate* stone and wooden textures in the model by using acrylic and paper so as to produce landscape, site and materials that would be similar to those in the actual building (see Bonfilio, 2000).

into architectural anthropology, the tiniest experiment with materials and shapes shows to what extent an architect has to be equipped with diverse tools in order to carry out the simplest procedure of visualizing a new building, making it knowable, real. The main actors in design at OMA are the models built in-house, which by dint of continuous remaking and reshaping push the design process ahead. 'A lot of *the actual design is developed through the models*. Since they are the closest representation to reality ... At the same time a lot of the actual design really happens on the models. That's why most of these models are in *a fairly rough state, because nothing is first finished, and then built to represent, but everything is built and continuously destroyed and rebuilt ...*'[7]

What would correspond in spatial terms to an office where 'everything is built and continuously re-destroyed and rebuilt' and where all presentational models are working models? A room in which every single working table contains a little movable model shop sector equipped with a foam cutter, blocks of foam and various cutting and pasting devices. Often situated next to the computer screens, the transportable model shops facilitate cognitive activities with models that are conterminous with and in addition to the computer visualizations. Although an unmovable model shop with heavy machines and specific cutting devices is situated on the ground floor of the office and is separated from the other spaces, it is frequented only on special occasions by the architects. Model-making happens everywhere; models are scattered around every corner of the office so as to make the new building appear more real.

It has been argued that architecture has to synthesize knowledge from different fields, relying on synthetic practices of representation and design. It needs to address many perspectives of the building and requires the ability to take into account divergent and sometimes apparently contradictory requirements (Boudon, 1992). Though different typologies of architectural knowledge have been developed, they always suggest a process of knowing that accounts only for the *knowledge of* designing architects. The typology of architectural knowledge remains stuck in the rigid dualism of conscious/

7   Interview with Ole, April 2002.

unconscious, transmitted by a master architect/gained, factual/procedural (Piotrowski and Robinson, 2000). It is mainly classified as explicit knowledge, disseminated primarily through academia and as knowledge embedded in the process of making architecture, the so-called tacit knowledge that is learnt by doing (Polanyi, 1967). Most studies focus on how architects learn to design, and follow young apprentices in the studio (Schön, 1987). Little is known about the situations in which knowledge is gained and about the mediators of knowledge acquisition and transmission – the objects, the tools, the materials that compel and facilitate learning in design process, such as models, diagrams, foam, calculators, plans, cutters, presentation panels. The term 'mediator' points to the fact that a variety of non-humans take active part in design in the course of action that is overtaken by other agencies, this being a main postulate of ANT (Latour, 2005). A mediator can transform, translate, distort, and modify meaning; it is unpredictable and cannot serve as a reification of the social like many faithful and predictable intermediaries; a mediator can constitute, recreate and modify the social relationships established by design.

In what follows, I will reflect on how architects learn from their models *about* the building-to-be, and how various heterogeneous materials function in order to generate epistemological effects. Drawing on the way models operate in design, together with other visuals like plans, drawings and diagrams, I will question the specific ways of gaining knowledge about a building: How do architects *learn* by modelling, scaling, and circulating the plans? What is it that one learns when one makes a model, scale it up and down, or circulate the plans? What does it mean to design? Thus, I will acknowledge the epistemological process through which the participants in design interpret a building.[8]

8   An interpretation of the question 'Why do architects make models?', in the spirit of the fashionable architectural theory of the 1990s, 'Why do architects draw?' (see Robbins and Cullinan, 1994), can be provided, recalling the many functions scale models play in design and public presentations, as well as the rationale of the modeling process. Such a generalized account of the role of models in design venture goes, however, beyond the scope of my particular interest in models as important actors in the Whitney design process.

Following science studies and cognitive anthropology, we can assume that much of the internal organization and operation of architectural cognition can be directly observed in the activities of model-making as they relate to the social and material environment of the architectural office.[9] At OMA 'there is basically no shelf that doesn't contain in some way a model in different phases or stages'.[10] Drawing on comparisons with other offices, designers argued that what makes the treatment of scale models different at OMA is that models are important tools for thinking about, imagining and designing a building (like AutoCAD or Illustrator[11]) and a crucial 'means of studying the impact of design'; models are created on a daily basis so as to facilitate every move in design venture – they are *working* models; models are always produced as a collection, as a bunch of diverse presentations of the same building, not as one large representation of the whole; the nature of OMA projects and clients is such that a design process that develops through subsequent repetitive operations, continuous tentative transformations and further translations, facilitated by models, will best suit the client's requirements; model-making is a collective venture, in which architects work 'side by side' (they delegate this task to a professional model maker only in particular cases).

At the start of the design process, architects from OMA conceive fuzzy approximations of the NEWhitney and make small-scale models according to few known parameters and given conditions (as discussed in Chapter One); then, they engage in a long process of obtaining more information about the extension. Relying on simplification and approximation,

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9　According to the 'glass-box' theory, the design process in architecture is transparent and can be witnessed and even recorded (see Jones, 1970; Broadbent, 1973; Heath, 1984). In contrast, 'the black box' theory of architectural conception accepts that all significant parts of the design process are internal and unavailable for empirical discussion; therefore design is considered to be a hermetic and undecipherable work of the brain (see Boyd, 1965; Akin and Weinel, 1982).

10　Interview with Ole, April 2002.

11　Adobe Illustrator is a graphical editing programme used by architects to generate computer graphics, discover new ways to experiment with colour and produce printed images of a building.

models at OMA not only 'make statements', but they also ask or answer questions, give information, make assumptions, express wishes, reassure or warn, create anticipation, announce intentions. The Whitney models do not only describe the building, or state how it is done. They act as gestural, spatial and operational tools of investigation, which help architects *learn* more about the Whitney and interpret its features. Engaging in a dialogue with concrete materials, spatial figures, proportions, dispositions, and shapes, designers from OMA acquire more data about the NEWhitney.[12] It is this communication with non-humans that allows us to gain access to the forms of cognition architects deploy in the course of daily design work: in the operations of slicing the foam, scaling the models, observation and analysis of their effects, as well as in the many translations from 2D-to-3D, and 3D-to-2D representations, and in the circulation of the architectural plans.[13]

Translating Knowledge in 2D-3D and 3D-2D

A simple glance at the office walls is enough to see the extensive use of visual tools that aid the development of different kinds of representations and outline distinct ways of 'making arguments for the building'.

12   In engineering design, too, theoretical methods cannot supply the requisite data that will enable engineers to gain the empirical data needed to carry out design. In a study on the cognitive dimension of engineering Vincenti (1990) noted that engineering design knowledge is acquired in a day-to-day enterprise according to a systematic experimental methodology.

13   This communication was defined as a 'reflexive conversation with the materials of the situation' (see Schön, 1985), rather than a process in which the designed object appears to be the result of a social process involving lengthy negotiations and discussions among participants, whose meaning and final shape depend on various modes of consensus and whose realization is triggered after a shared vision is gained (see Bucciarelli, 1994).

Architects use *all* these visuals simultaneously: 'the more tools the better, because all of them are necessary', argues Sarah. Thus, models never act alone in design; they always appear within the fine network of diagrams, plans, sketches and collages, and act according to their performance and explanatory potential demonstrated in design.[14] There is no strict logic or sequential usage of these visuals: 'They happen *simultaneously*', argues Sarah. 'And *one informs the other* as you go along. Maybe the diagram will help clarify the physical model, or some sketch model that somebody did can actually inspire or compel you, and you go back and find that on the diagram and see what relationships exist between them.'[15]

Sketches, diagrams, models, drawings, panels and collages inhabit the office environment all together: they share the cognitive weight of the building-to-be and make it observable through a co-operative effort. There is no obligatory starting point: some architects start with sketches, others begin with models. Those who prefer the flatness of tracing paper create the model afterwards according to the outline realized by pencil. Those who like to start with the rich texture of a foam model try to extract ideas by slicing the foam, then outline it conceptually on a piece of paper, a sketch 'which can never be as nice as the model' (only Rem's sketches are considered to be nice). The sketches of the Whitney are schematic, since they outline the basic ideas, assumptions and constraints.[16] They resemble the conceptual models, but differ from them in the speed of their creation and in their capacity to trigger further design actions. As 'models can tell more', according to architects from OMA, than a simple sketch can, they offer clear directions in the design process by providing specific instructions

14 Many examples from science studies show that in order to enhance the didactic value of models of scientific objects and phenomena, they are often accompanied by 2D coloured drawings and presented in collections of 2D and 3D visuals (see Hopwood, 2002).

15 Interview with Sarah, April 2002.

16 They are principal means of communication among the architects, both when Rem is abroad and the architects from the office have to send him an update by fax; and also in the immediacy of the office discussions, when the chief architect very often draws quick responses to the team's proposals.

on *how to act*, whereas sketches are considered to be more conceptual and intuitive. Models and sketches constantly refer to each other on their way to visualizing the NEWhitney building, which becomes more defined as they proliferate in the office.

Diagrams refer to models, as do sketches and other visuals. The programme diagram of the NEWhitney shows the way the exhibition programme is distributed throughout the building. It presents 'more technical information on the building, or only one aspect of it', as Erez put it, as compared to the drawings, which provide more accurate descriptions of the building. The translation from this diagram as a conceptual sketch of the Whitney programme into the programme model can be directly followed across Figures 9.1, 9.2, 9.3: each shade of colour represents a different kind of programme and is transferred straight from the diagram to the model so as to maintain an identical designation of the distinct spaces and their distribution.

When the diagram explaining the programme distribution in the NEWhitney is translated into a 3D model, architects get a better idea of 'how much space they are actually taking up, and what the spatial relationships between different types of programme are'. The way the programme is distributed throughout the building is also translated into the architectural plans so as to visualize the exact locations of foyer, auditorium, escalators, galleries and shop, as well as their interconnections in a *horizontal cut* through the building. As seen in the sequence of images the 3D model can be cut at different levels and the shades of colour that represent the same programme are kept to designate distinct spaces. They also signify the way the buildings in the NEWhitney ensemble connect to each other: the Breuer with the Gluckman, the brownstones with the Breuer building and the new tower. The technical drawings of the floor plans are done using AutoCAD, with high precision and accuracy. In these programme-oriented plans the circulation is indicated by light orange, the core of the building by dark orange, a peach colour represents the auditorium, while a pale orange guides us through the foyer to the shop. Thus, every time there is a different programme a different shade of orange is used to indicate it. The particular shade of orange from the diagram has to match the one on the model as well as on the plan.
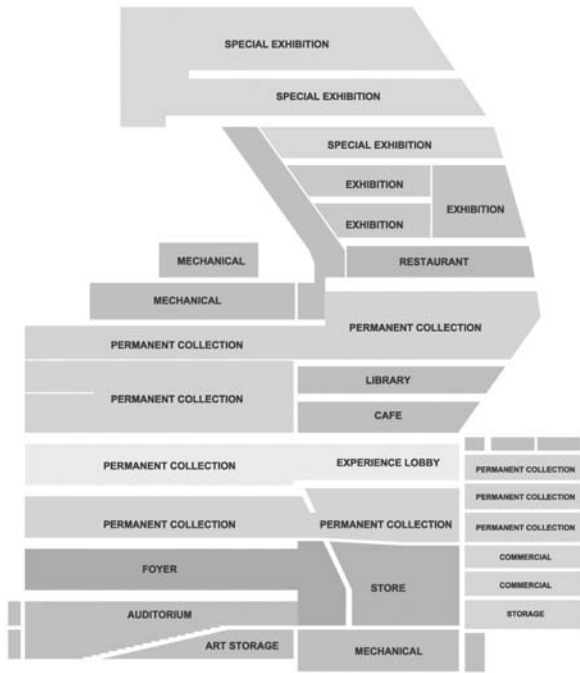
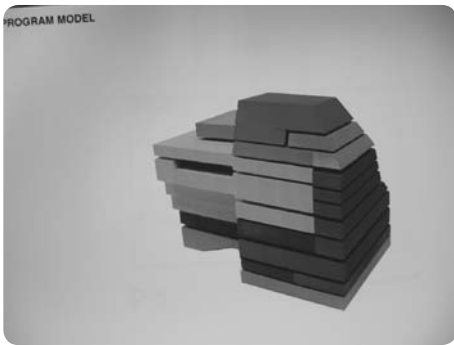Figure 9.1: Translation from programme diagram ... (© OMA)

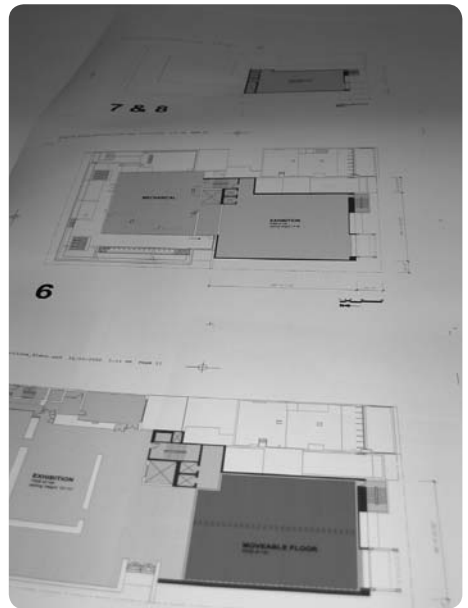Figure 9.2: ... to programme model ... (© OMA)

Figure 9.3: ... to a plan (© OMA)

What is translated from the diagram to the model and then again to another flat media – the plan – are the particular connections between the distinct spaces in the NEWhitney. The programme diagram, according to architects from OMA, does not show only one single thing, but rather highlights the mutual connectivity of spaces that interrelate and shape a working ensemble. That is, it shows the particular way the individual spaces are intermingled and produce 'a programme that works'. What is translated as you go from diagram to model, and from model to plan, is this mosaic of interconnections, which pertains even while the volumetric and spatial capacities of the building vary.

Very often the special volumetric information gained from the model is translated into flat images of different sorts: pictures, collages, photo-montages, or computer models. These images document the new data gained about the building and serve as protocols for carefully maintaining the traces of experiments with materials and shapes. On their flat surfaces one can find imprinted the 'faces' of the Whitney 3D models, the traces of their movements and transformations. Once a NEWhitney model is built, architects take a picture of it, and this is then transferred to the computer screen, where it can be corrected and manipulated again and again with Photoshop,[17] allowing architects to *see* the model up close. The proximity of the computer screens to the improvised model shops facilitates cognitive activities with the models that are conterminous with and in addition to the computer visualizations. There is a discrepancy apparent in the speed of the visuals' production: a model of the Whitney created in one hour requires more than five hours of additional Photoshop work for the production of a *good* image of it. The image on the computer screen can be manipulated to such an extent that architects are often surprised by the differences:

> I'm always *amazed* once you take photos of a model *how different they look*, and what different information they provide compared with the model itself. Even if you have the model sitting here and the picture here, you can have completely different perceptions of the space. I think that if you take pictures of this, you are able

17   Adobe Photoshop is a software that helps designers organize, refine, manipulate, and showcase digital images.

to get a better idea of the sequence of movements through the spaces, or the way the materials are applied to the spaces, and also the scale of the art in comparison with the spectators.[18]

I spent hours observing Erez in the silent process of manipulating images of NEWhitney models on the screen, and I wondered why architects do not begin modelling straightaway on the screen instead of engaging in the numerous time-consuming craft operations of foam slicing and shaping. Architects argue that screen models allow them 'to discover things', and to obtain new data about the building; they can extract an accurate description of a particular portion of the building, or even describe it entirely.[19] Screen models also serve as instruments for obtaining the technical information needed for the drawings or the diagrams, and facilitate the production of physical models. On the screen you can 'zoom in on the model and zoom and zoom, and you will have every detail that you want'. This process of unlimited zooming can continue to the extent that a minor detail such as a door handle can be defined with precision on the screen. When such details are being visualized, the computer model loses the capacity to take into account elements that are visible on the physical models, such as site specificity, relations with the adjacent buildings, street and cityscape. Another disadvantage of the fluid computer-generated models, considered to be 'weird' by the architects at OMA, is that they differ significantly from the building on the actual construction site. 'What appears smooth on the screen is fractured in the real production,' argues Olga. 'Foam models are closer to the final production', she says, 'they are more related to building technology.'[20] Thus, foam appears for architects at OMA to be the particular material that will make the model-to-building connection happen more quickly.

18   Interview with Sarah, June 2002.
19   Following the production of the economical models of Philipp, intended to visualize how the Kenyan economy works on the basis of similarities with hydraulic physics, Morgan and Boumans argue that in the passage from 2D-to-3D some *hidden* things are revealed, and 'a specific kind of hidden knowledge gets communicated only by using the 3D model' (2004, p. 371).
20   Interview with Olga, June 2002.

Hence, although physical models prevail in the office and are used as a tool for presenting the project to architects, clients and proto-users, there is a simultaneous process of modelling on screen and with foam. In this way all aspects of the building can be accounted for: details and proportions (on the screen) and spatial and volumetric capacities (in the immediacy of the foam model).

> You do not really get an idea about the scale, you just see it and *it's very different to see it on a real model*. I cannot explain it to you. *There is this feeling of scale that is for me immediately evident on the real model.* And it's different on the computer ... on the model you see all the relationships with the surroundings ... how the real masses are done. You can immediately put yourself outside and you can visualize 'oh, it's like that.' And it's really different on the computer. *It's just the way it looks.*[21]

If the feeling of scale and spatial presence that can neither be sketched nor drawn is so unique on the physical models and cannot be obtained with computer images, why do architects constantly go back to the two-dimensional presentations of the building? Why do they move back and forth so often between foam models and diagrams, sketches and models, screen and paper?

The interaction of drawings, models and photography provides a more realistic picture of the building. As Porter puts it:

> It is through the adoption of multi-views of its impression and its metamorphic testing along two, three and four dimensions that we allow a new conception to 'breathe' and simultaneously extend our power of visualisation. By making drawings from physical models and transferring graphic information into three-dimensional constructs we also *increase our knowledge* and experience of media which not only avoid the familiar stylism trap but, within a more creative and developing design dialogue, begin to harness an awareness of appropriate design vehicles to each individual and unique concept of architecture.[22]

At OMA I observed a continuous transmission of information among the different visuals, zooming *into* details and zooming *out* to the bigger

21   Interview with Abdji, June 2002.
22   Porter, 1979, p. 90.

representation with more contextual elements, converting the imperceptible traces of the image into the foam features of the model; context into content. The 2D representations of a model act as a microscope that allows architects to obtain a closer view of the model and discover things that cannot be seen in 3D.[23] A specific kind of hidden dispositional knowledge is revealed through the 2D-to-3D and 3D-to-2D translations. The knowledge discovered through the careful examination of flat images of a model lead the architects to go back to the physical model and modify it according to the minuscule changes perceived in the process of zooming in on the screen images. After the model is corrected and 'made up' during long hours of repetitive moves in Photoshop, architects produce photomontages in order to see how the building will look in the streetscape surrounded by buildings and how it fits into the city fabric. The photomontage accommodates more contextual elements and brings in further details about people, buildings, city, cars, and trees. On this basis a new site model can be produced.

One can see how the little knowledge that is obtained through the model *adds up* and facilitates the production of flat images that will gain dispositional knowledge on a different scale, and which will in turn send us, after the examination of the flat images, back to the models. Thus, flat images are tools for generating better models; models are tools for making better images. As Erez argues: '… *the Whitney building has been changing all the time*. It's not that you do something, and that's it. All the time we are getting data, and that's why it changes all the time. And we update the plans, which means the documentation of the building, we update the diagrams, we update the models, etc.'[24]

Acting complementarily and in cooperation, the 2D-to-3D and 3D-to-2D translations shape a process of *continuous knowledge transfer*, in which the building gradually becomes known. Just as the visuals are viewed simultaneously, so they change simultaneously. If there is any sequential logic

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23   Recent studies of models have traced the trajectories of physical models from the architectural studio to the construction site and analyzed the newly developed relationship between 3D physical models and 2D computer renderings (see Porter and Neale, 2000).

24   Interview with Erez, April 2002.

to a model fabrication, it is related to the degree of knowledge: architects start by cutting and modelling that part of the building they know most about; as soon as more data is obtained about the unknown features of the building, the architects can begin to create other parts of the model. The vector of gaining knowledge follows the simple logic of accumulation, or mathematical *addition.* As soon as new data is obtained about one area of the building, it is incorporated into it so as to be able to inform the adjacent visuals, which are connected with the one that has undergone changes. This process of information acquisition logically entails the actualization of other interrelated visual media. The continuous updating of the visuals in the network acquires a different speed when a deadline approaches; it accelerates the changes in it and enhances its referential capacities.

Knowing the Building by Slicing the Foam

Many actors take part in the painstaking model-making operations: foam cutter, rulers, foam blocks, architects and measuring instruments. The thinking about the size and the proportions of the model is rooted in the foam cutter – a special machine used by architects to slice the foam materials and produce different curved shapes. Composed of a heater and a scale, the machine can regulate the heat in order to cut various sizes of foam with varying intensity, while the scale can be adjusted to different measures. The foam cutting is carried out both by the foam cutter and by the architects manipulating it: they adjust their movements according to the different speeds of the instrument; they push the regulator button, adjust the scale, guide the piece of foam to the edge of the burning heat.

What is Shiro doing with his hands? He regulates the heat in order to cut various sizes of foam with different intensity (Figure 10); he adjusts the scale so as to be able to produce different shapes and thus starts eliminating parts of the foam's mass by burning its texture: 'It gets hot, and it burns and cuts the material; that's why it smells,' says Shiro. The heat regulator can be adjusted to cut in different ways: thinner, more refined

strips are cut faster with less heat and smell, while larger pieces of foam are cut more slowly with a higher heat and a repulsive smell. 'I'm sure it's not very healthy, but the models in the office are made more quickly with this material,' argues the architect.

Figure 10: An architect using the foam cutter (photograph by the author)

Using foam is the easiest way for architects to study the volumetric qualities of the new building according to the programme requirements of the client. While manipulating foam, architects feel that they are positioned *inside* the material, producing its curves and shapes: 'you have a mass, the matter is there, and it is transformed'. Thus, they engage in a craft process

of matter transformation, fighting with the foam, adapting their postures
to its requirements, leaving their imprints in its texture. While curving
the foam, architects can modulate and modify the shapes according to the
speed of the hand, the scaling of the foam, the technical performance of
the instrument, the intensity of the smell of the burnt material. Although
it contains a lot of individuals' marks from this craft process, the model
emerges as a collective product of the Whitney team, as many architects
intervene subsequently in the same process of model production. Architects
can produce shapes in foam that cannot be generated with other materials.
As Olga explained, this is because it is possible 'to change the angle of the
foam cutter and also the *speed* with which you cut. You can test with foam
much more quickly. And there is this technique of thin slices that helps
you to develop more plane buildings, because you can bend the floors super
easy. You can cut out pieces and put them together.'[25]

Thus, architects, instruments and foam share the process of creation
of the Whitney models. There is an active cognition *in* the foam-cutting
technique that brings into being the foam models. This technique possesses
properties that generate certain specific architectural forms that cannot
be produced with other modelling techniques. For example, the use of
cardboard confers rectangularity, planarity, and symmetry on its subject,
while foam cutting confers asymmetry, curves and twists. It partly explains
the unusually distorted shape of the NEWhitney. The building is directly
affected by the way its models are built and their constitutive pieces scaled
and shaped. It is meant to repeat, stabilize and reproduce the multifarious
effects achieved in the foam cutting and in the experiments with models.
The malleability of the model creates a building that is changeable right up
until the final construction. Existing simultaneously, the models inform,
alter and improve the building to the extent that even buildings in con-
struction are corrected together with their models.[26]

25   Interview with Olga, October 2002.
26   I witnessed this process on the construction site of the Dutch Embassy in Berlin (also
       designed by Koolhaas, and completed in 2004), where I was conducting interviews
       with architects from OMA, who were working temporarily in Berlin at the time
       of the construction. A collection of scale models, including a huge model of the

The speed of cutting the foam with variable angles is facilitated considerably by the properties of the foam itself. Foam is more flexible than resin, metal and wood – materials usually used for presentational models by a professional model-maker; it is soft, direct and versatile, easy to shape 'once you get your hands on the foam cutter'. It is also very interactive, mixing with different paints and chemicals to produce new textures. By cutting and adjusting the foam pieces, architects gain insights they might not otherwise have achieved: 'If you desperately want to find a smart idea, you go cutting foam', argues Olga. Thus, scale models of the Whitney are powerful settings for generating new ideas, and quickly capture the sudden occurrence of something new in the modelling venture. They are the perfect medium for rapid cognition: 'I can't say that you think first, and then

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Embassy building, was laid out in a mini architectural office next to the construction site. Under the pressure of the construction, and in front of the eyes of astonished workers and engineers, architects constantly moved back and forth between the building-in-construction and its models, comparing, correcting and simultaneously updating them. Models and building stood side by side, and were amended and improved at the same time.

This experience witnesses for a specific relationship of models and buildings, as seen into the OMA experience limelight. Building and models stand together as two simultaneously present competitive arrangements in architectural design. There is no way to get out of the model without getting into the building, there is no way to get out of the building without getting into the model. The model serves as a way of seeing, anticipating and envisioning the building because it 'carries a similar spirit or understanding'. Every change in it, every tiny adjustment is meant to 'influence' the building to a certain extent. As architects from OMA put it, the model is made in order to see '*how it affects the building*'. Models and building are associated in a way that once architects, clients, and public see the models, they think of the building.

Thus, the direction of the whole design process is not an ultimate Building: instead of beginning with models and ending up with a building in a linear, step-by-step progressing venture, design contains both models and building as two occurring events; each of them is a *moment* from the becoming of the other, each of them *emerges* under certain conditions from the other. Both models and building are defined as two states of an active matter, two pausing 'moments' of it. Rather than being a *terminus*, the building stands next to its models, coalescent or conterminous with them; that is why a composition of few models is always kept in the office and on the construction site.

you do the models', says Olga. 'Sometimes you slice something, and then another thing, and so on and so forth, and *ou-u-u-pppp something is there*. And you think, "ohhh, that's interesting."'[27]

Something new emerges as the Whitney building is executed via modelling, in the repetitive process of slicing the foam, after many routine gestures and reiterative adjustments. This particular 'ou-u-u-pppp' moment of surprise shows that the new emerges from many routinely performed actions and skilful operations, and from an in-depth dialogue with materials and shapes.

Thus, the foam is not just what the Whitney models are produced from. It *mediates* the very process of thinking about the Whitney extension. Foam slicing is more appropriate for rapid thinking and tests, as compared to casting, which is often used for office presentations. Special preparation and a period of anticipation is required for this technique, since a precise mould has to be fabricated, which then has to be sanded and polished. A laborious and complicated technique like casting is time-consuming and can be used only for the creation of final models, when ideas have stabilized and more characteristics of the building are known. As this technique is complicated time is also needed for the preliminary calculations. 'Sometimes you need a few hours to see where you are before reaching the final result', state the architects. Stable materials are used when architects have a greater degree of certainty in predicting the building's features. With foam, architects from the Whitney team think *in the moment* of cutting instead of anticipating in advance; the cognitive process runs more smoothly, with a smaller risk of breaking and dispersing the materials. Yet, in the process of this tentative manipulation of the foam a lot of unexpected events occur, accidental interim models emerge and flood the architectural office.

Foam guides the way designers 'cut a straight line', argues Shiro, and allows more shaping, boxing and enclosing of things. Thus, architects delegate to the material the power to enfold to the extent that at a given moment the foam can begin to dominate the model-maker and the 'knowing architect' loses mastery over the building he is striving to understand:

27   Interview with Olga, February 2002.

'... the foam is really fast and direct, and it's really good for working in masses, and it's so *soft* but you can cut it really sharply and in small pieces. It is also a material that you can apply *without having total control*. This is like painting three-dimensionally; we created a lot of curved forms by melting the foam with tools and aggressive paints. By doing so we created a lot of nice textures.'[28]

Engaging in communication with foam as a direct and very interactive material, architects *feel* the effect of every new model they make. Slicing and manipulating the foam, they are not completely aware of *what* exactly they are doing and *where* their work is going. Nevertheless, they experience each particular effect of doing and undergoing in relation to the whole that has to be produced. Thus, architects discover what they are doing and thinking in the course of doing it. The malleability of foam makes it difficult to cut it at a particular angle and so entails tentative and accidental gestures, even failures, in the execution of numerous model-making operations. Yet this is also the reason why architects use this particular material to think with – as a quick mediator of both successful and unsuccessful execution. Mistakes are significant because they redefine the experimental conditions, and allow new configurations of assumptions. To understand this relationship between making models and making mistakes, between doing and undergoing, is to think architecturally.[29]

Once the building shape is generated, meticulous plans and sections are needed to reproduce the shape of the first models. Rotterdam: a late afternoon in September 2002. I follow Abji as he makes a scale model of the new Whitney extension. He cuts out the little plan from a bigger sheet of paper. He takes a ruler and begins measuring the section again, then he measures it with a set square, as if the dimensions are to be discovered in the process of measuring the little pieces of paper; then he takes a cutter

28   Interview with Alain, April 2002.
29   Mistakes allow new shapes to be created and open up new possibilities for the building by triggering scenarios unforeseen in the initial architectural plans and sketches. They point up the delicately achieved balance between the manipulation of matter and its result, which combined with differences in the dexterity of execution make the scale models of the building extremely diverse.

and cuts out a part of the section. After that, the paper cut out is applied
to the vertical side of the foam cube. Its contours are carefully marked on
the foam block with a cutter scratching out its exact profile. Abji starts
meticulously cutting out the foam according to the scratches left on the
foam surface as imprints from the section dimensions. Abji points to the
model and asks Erez: 'Am I cutting according to the existing conditions?
This height?' Erez nods and watches how the foam material is being sliced
according to the paper cut out so as to be able to get its exact outline. Dif-
ferent foam pieces are produced in the same way and are then assembled
and glued together to compose a coherent entity – a model. How exactly
does this happen?
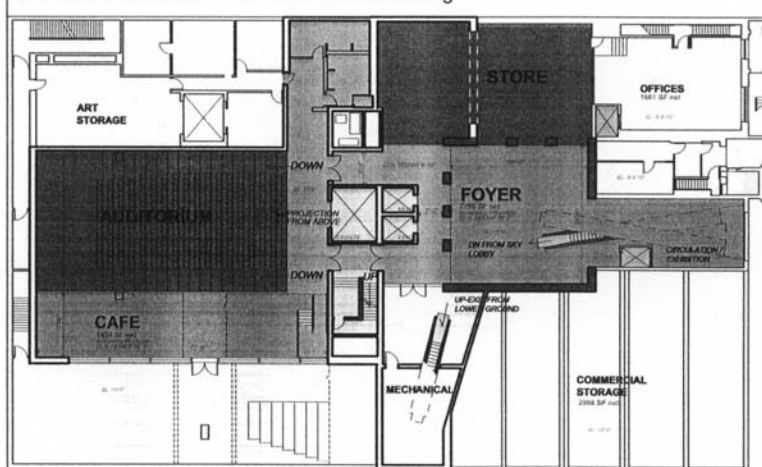
Figure 11.1: Sequence of operations of cutting-and-pasting: phase 1
(photograph by the author)

Figure 11.2: Sequence of operations of cutting-and-pasting: phase 2
(photograph by the author)
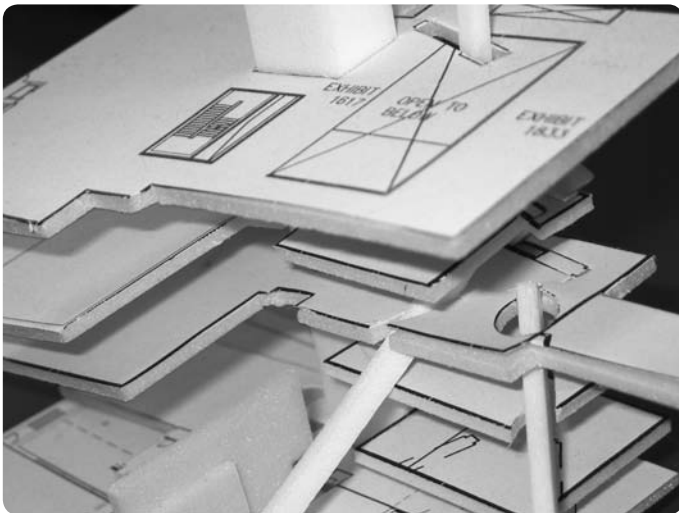
Figure 11.3: Sequence of operations of cutting-and-pasting: phase 3
(photograph by the author)

There is a specific rhythm that we can observe: many simple procedures of printing, cutting out, sticking, pasting, marking the contours, foam cutting, gluing and assembling the building follow one after the other. Detached from the texture of the architectural plans, and applied to the foam (as seen in Figures 11.1, 11.2 and 11.3), the paper cuts act independently and are used as significant material support in model-making. They become material matrices facilitating the direct translation of numeric data gained on the computer into volume and proportion data gained through the shaping of a model. In the chain of translations the same proportions are kept but the degree of detail and concreteness varies. Thus, the model arises out of a particular sequence of physical operations, as it is handled, measured and altered. These manipulations are performed when *more* is known about the building and therefore a higher degree of precision is required at this stage to reproduce the shape generated by the foam cutting, as opposed to the very beginning of the design process, when architects brainstorm with materials to produce the experimental models.

As we follow the foam slicing and the cutting and pasting – those constitutive parts of the model-making venture – we can see that the Whitney models are produced in a highly-skilled way. Genuinely experimental rather than being merely descriptive or artistic tools, they are collective craft products executed through manual labour and repeated actions. Following architects from the Whitney team at work, we witness the transformations of the foam matter, as well as those of the architects' bodies and instruments in the search for the most suitable model shape of the Whitney extension, which becomes gradually more defined as the foam is sliced, pasted and assembled. The Whitney models come about not just through thoughts inside the architect's head, but in active operations *with* and *upon* things.

Gaining Knowledge by Observation of Models

If doing is the active phase of model design, defined in terms of skilled action, and ability in execution, appreciating, perceiving and enjoying is the other phase. The numerous Whitney models generated throughout the design process provide architects with a variety of ways to *observe* the Whitney building. Invisible, undetectable, and vague at the very beginning, the building exists in visible and tangible models throughout the process until its final definition. Although the Whitney is a highly-complex building, knowledge of it does not require the architects to shatter it into fragments. Instead, a comprehensive observation of the building as a complex entity is furthered from the very first brainstorming. As Sho argues: 'We take these models seriously and try to analyze the intention and always try *to look for new and interesting ideas in the very naïve-looking models*. I'm sure that some architects laugh when they look at them, but we are pretty serious in using them to analyze what is really good and what is bad, and to create new things.'[30]

Knowledge about the building advances through direct observation of the scale models (Figure 12), when, in the process of inspecting the 'naïve-looking models', new ideas emerge. Some design theoreticians have stressed the important role of observation and appreciation in architectural design (Bonta, 1979; Akin and Weinel, 1982; Heath, 1984; Porter, 1988; Boudon, 1992; Lawson, 1994). According to them 'appreciation' is what the designer engages in while observing a site in order to detect those elements that should be part of the design; it opens up the interpretation of different architectural elements and enables their transformation. Thus, the architect is seen as a skilled observer who tries to convey the appreciation of sites and buildings in the design process. The inner logic of design appears as quasi-independent of context, and is defined as 'a dialogue between the architect's appreciation of a site, on the one hand, and his images, prototypes and principles, on the other' (Porter, 1988). However, such a

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30   Interview with Sho, April, 2002.

definition cannot be applied to the 'inner logic of design' at OMA. Here, architects, engineers and model-makers live in a world where appreciation is framed, triggered and enacted by models. Architects from the Whitney team rarely left the office to visit the site; for them the models constituted the real buildings.

Figure 12: Architects and visitors engage in model observation
(photograph by the author)

At OMA the Whitney building is examined by designers via models as if it were a slide under a microscope or a cadaver on the dissection table – their work is directed strictly at the observable. Models allow the not-yet-existing building to be perceived and appreciated. By reacting to models, and allowing themselves to be surprised and acted upon, as well as by presenting the models to clients, external visitors, and colleagues, architects can detect the consequences of the models' actions, and their effects on those who will experience them later. Thanks to the physical models the

Whitney building is not only observable, but can also be *experienced* in a tactile manner.

The Whitney building first appears in the design studio as an object to be experienced sensually: it is perceived by some architects as beautiful and gripping and by others as ugly and weird. Its advantages are described by the architects in sensual terms: they talk of its tactility, its visual richness, corporal accessibility and easy manipulation. This is another reason why the physical models of the Whitney act in a different way to the computer models:

> I think that you can see a 3D model and really understand it from every side, I mean a *physical model*, whereas on the computer model you never *sense it* because you are still looking at the flat images. I don't think you ever get the same. You always discover a new thing on a computer model, that you may not be able to see on a physical model; but the physical model – you can *hold it*, you can have this tactility, and you can *manipulate it* quite easily.[31]

Since architects can touch physical models and turn around them, they can sense them; and the models can *tell* them more. The Whitney building as an ultimately overwhelming reality is first conceived as a tiny graspable piece. Moreover, it can be literally held in the hands like a piece of jewellery. Through models the Whitney building can be seen from different vantage points. The tactile, sensual and easily modifiable physical models are much more powerful tools for *sparking* the architects' imagination than other visuals in the studio. They have a strong spatial presence, whereas the computer models remain hidden on the hard drives, and the sketches and plans share the flatness of the tables and the drawing boards. Physical models actively intervene in the various design operations and interact with the office environment. They capture time and space and the attention of humans, and they assemble architects in the physical space. All foam models, even the unsuccessful ones, are kept and accumulated in the office; thus the elements needed for the building to be defined are gradually collected together. As architects act in this very dense 'foam'

31   Interview with Carol, April 2002.

environment, every single encounter with foam try-outs, models and materials from different projects can spark their imagination and serve as the cognitive jumping-off point for a new shape or a new option. This is the particular moment when 'something' in the model compels the architect to seize a new thought. In the act of appreciating the models, architects enter into a dialogue with them, which in turn triggers new possibilities for the building.

The indefinable 'something' in the model is also what provides the opportunity for the master architect to grasp the latest development of a project in the space of a few minutes, which is usually all the time he has, since he supervises many projects at the same time. It also denotes a very distinctive feature of design – its reversibility. Models are kept because this makes it possible for architects to always go back to them: 'there is *something* in a small model, and after two weeks, going back to the model, you can *see* this thing'. Another architect can go back to the same model with different assumptions and interpret it in a different way. 'Perhaps in the team everybody will find some model distasteful, or not very nice,' says Kunlé. 'And that model suddenly becomes the most important model for somebody who can *see some potential in it*, an idea … Sometimes the models that are the most grotesque or repugnant may gain some interesting qualities in the *process of inspection*.'[32]

The foam environment stimulates new readings of the existing models in a collective venture of inspection and interaction. In these dialogues architects can often misinterpret models produced by someone else.[33] Such experiences favour a flexible experimentation process in which a tiny diversion from the initial experimental scenario can instate new experimental

32   Interview with Kunlé, September 2002.
33   For instance, part of the model of the Seattle Public Library (OMA and Koolhaas, 2004) was misinterpreted by an architect in the office and was literally taken for the whole building. This accidental misapprehension turned to be a successful design solution. Another example, often mentioned in the office, is the Porto building design. In this case, a model of a private mansion, recovered from the office archives, was successfully transformed into a public building – the Casa da Musica, Porto (OMA, 2005).

conditions and new interpretations, often considered after the fact to be acts of invention. The model does not act as a single isolated object; rather it demonstrates the emerging characteristics of a series of transformations: interacting with the model, an architect triggers at the same time the conditions for the actions of other models-and-architects. Physical models carry this special potential, which often surprises the architects. There is always some new feature, a new quality that emerges and changes the model's profile in a way that cannot be foreseen.

Thanks to the models, and the direct observation of an interaction with them, the building becomes present *in* the office. Observation does not report *by fiat*; it is checked and rechecked by many architects and visitors in the course of their own work. It is a process of inspection conducted with respect to the observing architects, the models that are being investigated and observed, and the process of observation itself. Observation is set free, and it progresses with postulatory appraisal: it is a tentative and enduring process, in which architects *push* the process *forward*, probe different scenarios for the creation of the building and the gaining of knowledge about it, then *go back* to evaluate them.[34]

Knowing by Testing the Models

The Whitney models are subjected to various tests, assembled, probed, measured, and mobilized in order to gain knowledge about the building-to-be. Thus, in addition to the various functions scale models possess, they act as important cognitive tools.[35] Without establishing *a priori* condi-

34 The term scenario is used by architects to describe the possible ways the building (or its features – structural, programmatic and so on) may be developed; whereas the scheme is already a well-developed and established design proposal, and the plan for achieving it (i.e. Scheme A and Scheme B).

35 In science, scale models are also used as *research aids* applied to understanding unknown mechanisms and predicting possible reactions by giving them visual

tions, architects immerse themselves in experimentation.[36] The tests aim to probe the parameters and realities of the Whitney building. They set the conditions required for further operations, raise a whole raft of questions concerning the unknown elements of the Whitney extension, and take into account the ability to cope with the new variables that are added to the existing experimental conditions:

> In scheme A of the Whitney, we knew a lot about what was difficult, but *we did not know necessarily the answers.* So, one question would be: 'OK, where is the entrance?' The question of the entrance is a difficult one in the Whitney, because there is already the Breuer entrance. So, do you have a second entrance? Do you keep the Breuer building's entrance? We had all these issues, and we went through all of them, tested them.[37]

A model is quickly created to answer the questions 'What are the conditions for the entrance?' 'What should the entrance look like?' This completely unknown feature of the Whitney extension has to be defined, and additional knowledge about the entrance possibilities in the building should be gained through modelling. Thus, knowledge about the building

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plausibility. Embodying the results of scientists' investigations, models form the starting points for further steps of theory refinement, and trigger new directions of scientific exploration. Models are autonomous agents, functioning as instruments of investigation and experiment, measurement and correction (see Morgan and Morrison, 1999). In the process of modelling a molecular structure, an embryo in wax, or a complex hydraulic machine new knowledge is *obtained*, as recent studies on the 'third dimension of science' have shown, drawing on the importance of models as research aids in scientific enquiry (see de Chadarevian and Hopwood, 2004).

36   In a recent study, John Law shows how aircraft designers engage in a sequential proc-ess of prototyping and testing to learn what is acceptable for establishing the best wing design, in terms of a relatively stable and determinate shape. Through different *tests* of the extent to which the wing passes through vertical gusts of wind, the way it bounces up and down, and the way it experiences turbulence, they find a strategy for modelling the factors that might affect gust response. These factors refer to a variety of external realities: the weight leads into the realm of 'bureaucratic politics', the size of the wing, 'to the Russians' (the need for short take-off from camouflaged airstrips) (see Law, 2002).

37   Interview with Carol, October 2002.

requires continuous tests on models. Every newly obtained feature of the building is quickly visualized via models so that architects can witness the materialization of their assumptions and can see how exactly the model, as an entity, will look with this particular element changed. The 'entrance model' is the visual answer to the question 'what does the entrance look like?' Architects make assumptions, then build the model and test it, and by doing so they get an answer to their question. They extract dispositional rather than factual knowledge – the 'how' and 'where' rather than the 'what'. The models themselves also probe the different scenarios for the entrance and pose new questions about the entry conditions, thus operating as powerful interrogative and testing devices. The dual nature of this process, simultaneously defining and answering design questions, shows the 'epistemological uniqueness' of design (Schön, 1983).

In the series of experimental tests with models the gross fact of a huge and unknown building is progressively broken down into a number of independent questions referring to different variables: issues of circulation, entrance conditions, structure. Some of these had never before been asked or even thought of in connection with the building. As each question is asked, new models are produced and staged on the table; thus, new facets of the building and new scenarios are defined. Experimentation with models is the chief resource for architectural reasoning about the Whitney building. It is instituted by varying the conditions on the basis of new assumptions, queries and given conditions, and by instating the observation of the material outcomes afterwards. This thorough observation is a very powerful tool for identifying the experiments' results and triggering new experimental directions: tests are carried out 'to *see immediately* how it looks'; contemplation of models in the office environment often stimulates new experiments with variable conditions. Thus, through models knowledge appears to be observable in exactly the same sense as the things that are known; there is no 'something known' apart from its knowing and identification, and there is no process of knowing the Whitney building apart from the features and aspects that are being identified.

The interaction with the models is a form of empirical thinking very specific to architects at work. Depending on the questions that are addressed in the process of testing, and which are answered and posed anew by the

models themselves, designers are perforce adopting different points of view and mobilizing different means of gaining knowledge in order to fully understand the Whitney building.[38] Once the model is made, a new feature defined or new data gained, architects confront the models according to the criteria and site parameters that are already known. Carol explains: 'You test a model if you have an idea and there might be something in that idea that you like and that is compelling, and you may not be sure what is it that you like about it, and *testing is judging it by parameters* that apply to the specific site, to specific programmes, to specific requirements of the client in terms of size or height. So testing is putting it against the criteria *that you already know*'.[39]

Every single model of the Whitney that extracts new knowledge is constantly confronted by the given conditions and parameters that are known (as discussed in Chapter One). At that moment architects say: 'now, we *know* more'. But, what does it mean to know *more* about a still-distant object – the Whitney extension? What does it mean to state that *more* knowledge is gained in a new configuration of variables, at the very moment of confrontation between freshly obtained data and already known criteria? There is an important cognitive dimension to the process of gaining new 'answers' to queries related to the building and confronting them with old parameters. When architects say, 'now we know more', it means that new data is gained and added to the existing data, and that this is what will lead designers to the final building. To know a distant object – the Whitney extension – is to come to it via the numerous models that simulate,

38   That modelling as a process has triggered changes in three-dimensional representa-
      tions of molecules is one of the major contributions of chemical model-making, for
      instance. Building, looking at, and manipulating models are crucial to appreciating
      the results of crystallographers, which are hard to convey in words and pictures.
      Mixing serious science with children's toys, manipulating tin boxes or tinkering with
      little spheres and toothpicks, chemists in the nineteenth century used models not
      only to visualize theoretical chemical notions, but also to *testify* them (see Meinel,
      2004). Even in a field like economics, which is far from being a model-based science,
      models are used to *test* particular phenomena (see Morgan and Boumans, 2004).
39   Interview with Carol, October 2002.

anticipate and generate properties of the building. When, as mediators in this process, models develop harmoniously towards the reality of the building, it means more features of the building are defined, more unknowns are being transformed into knowns, and architects feel that one direction is being followed, and finally one process is fulfilled. This process of *adding up* new data is all that architects mean by 'knowing the building'.

Knowing the Whitney by Scaling

Architects also learn about the Whitney building by shifting the scales between small-scale and large-scale models.[40] If the small model of the Whitney is undefined and abstract, deploying rough figures and approximate relationships, the large-scale model is meticulous and enriched with more data and concrete details (Figure 8).

These details emerge only after numerous procedures of repeated *scoping in* the small model and replicating it on a bigger scale. In this reiterative process, the knowledge gained by an architect inspecting the small Whitney model is subsequently articulated and cognitively shared with the team; monocular inspection is followed by binocular examination of the large-scale model. The bigger model has the advantage that it can be seen by many architects at the same time, and it can change the cognitive properties of

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40   Here, I refer to my previous study on scaling in architectural design (see Yaneva, 2005b). In this essay, I took into account the cognitive dimensions of the scaling venture and described the rhythm of scaling as relying on procedures for *partial seeing*: scoping, rescaling, stepping up the scale, 'jumping' in scale, extending and reducing the material features of scale models, inspecting and overseeing various aspects of the building. Scaling requires special equipment, instruments and embodied routines for manipulating models, as well as meticulous work with foam and paper for seeing and defining details.

the team.[41] Since concrete details (such as transitions, escalators, thresholds, and stairs) cannot be viewed adequately in small models, architects scale up to define and clarify more aspects of the building's interior. Such repetition with scale variations is how working with the small model leads to details becoming incorporated into the large one. The larger and more differentiated model does not differ in a quasi-evolutionary fashion from the small one; rather, it is a tool for seeing better, gaining new knowledge, enrolling more actors and refining the small-scale model. Although it is a mediator in the scaling process, not its final goal, it is not an ephemeral visual device. It is kept on the table of models along with numerous small-scale models, drawings and collages, and foam and paper try-outs. Although stabilized in a given shape, none of the models is completely defined; any of them can be materially changed, thus triggering a chain of modifications.

During the scaling up there is no reference to the parameters according to which the first models of the Whitney have been created – the existing site conditions, the zoning envelope, the adjacent brownstones and Breuer building, the city fabric, urban density, and district fragmentation. Thus, the upward scaling move produces a double detachment – from these given parameters, and at the same time from the small-scale model. The large model is brought into existence by reference to the small one; the small model points to the large one. This is a particular moment in which models refer only to each other and trace a circular trajectory (instead of adopting an external factor as a centre of meaning). This circularity is important, as it provides possibilities for re-examining again and again the different presentational states of the building before further development and definition.

I followed architects from the Whitney team in the process of designing a huge exhibition hall for the museum extension, having as a particular design task to find a specific position for a red escalator. From the very

41   As shown by Hutchins, the cognitive properties of the group differ significantly from the cognitive properties of an individual member (see Hutchins, 1991; 1995). On cognition as embedded in social practices and distributed within group activities see also Lave, 1988; Lave and Wenger, 1991.

beginning architects did not understand what designing this particular escalator position would mean. This is why the art of thinking architecturally about space seems elusive and mysterious, as though burdened with epistemological paradoxes.[42] Without knowing the spatial features they are looking for in the new (or, rather, not-yet-existent) exhibition hall of the NEWhitney, nor what exactly they need to know in order to be able to conceive of those features, architects take a plunge into the scaling circuit and rely on only a few stable parameters. In this circuit, one can observe an important degree of abstraction from the building programme. Likewise, some problematic issues are solved in the scaling. Thus, the fundamental features of the building are grasped only in the process of designing it – by scoping *in* on the small model and subsequently transforming what is seen into a bigger model, architects gain knowledge about the spatial dispositions of the NEWhitney exhibition hall. The modelscope[43] provides them with direct access to an unknown (and sometimes disputed) state of affairs on a small scale, supplying resolutions to the particular design issues that are then transferred to a larger scale model. As the design process develops, the scales are shifted and new data about the building is gained:

> We work on a model and a drawing at the same time. Sometimes the drawing will *tell you more* than the model and you go back and forth between the two. And then,

42 By following architecture students as they learn to design, Schön (1985) defines an epistemological paradox of the architectural studio: on the one hand, students need to learn a new competence, and they do not initially understand what they need to learn; on the other hand, they can only educate themselves by beginning to do design work.

43 The real name of this instrument is a borescope. It is primarily designed for the observation and inspection of the inside of machines, equipment and structures. Since in the architectural office it is used to inspect the interior of the scale models, it is called 'modelscope' and is largely used at OMA. Sometimes the viewing experience is mediated by a camera with tiny manoeuvrable lenses, which is able to enter the model and to document the static interior in the form of a moving image. If the first reason architects from OMA enter the small model is to experience the space and to use this immediate knowledge for the physical transformation of the model, the second reason is to obtain images of the building that will be closer to the ways in which people will experience it (and to use them for presentations).

you go back to the model and this *tells* you something different and you have to change the drawing. And I think it's the same for the large scale as it is for the small scale. Once we get further on in the process, into the design development, *we know* the shape, *we know* where the floor levels are, *we know* where the windows are, but then you start to look at more interior spaces and you might make a much larger model which is proportional to that space. But that in turn may *affect* the smaller one. And you might say this window has to be like this to get this kind of light, and that means changes, and we have *to take it back down* to see how it looks. So, it's back and forth between the scales.[44]

As architects shift between scales they enter into dialogue with physical materials, far removed from any mental models (Gorman, 1997). These materials offer resistance and opposition and set up tensions within. The architects thus acquire more knowledge about shapes, dispositions, locations – not factual knowledge, but knowledge about spatial transitions: it is not a case of 'knowing that', but 'knowing where'. In the translation from the small to the big, a special connection is maintained between the two types of models that makes it possible for changes in the large model to 'affect the smaller one'. Architects 'take the changes back down' to the small model and update it. That is, data are transmitted back to the small model, but always schematically, so it can account for an abstract and broad-spectrum method for presenting the state of the building. Moving up and down in scale allows us to discover two hologram-like faces of the Whitney building, which correspond to two arrangements of models – paper cuts and foam models – kept on two adjacent tables in the office. They account for two distinct states of the Whitney building. One table contains tiny, fuzzy and abstract models, which present a state at which *little* is known about the NEWhitney. Fewer actors are mobilized in this model, but the modelscope allows architects to gain more information about the building. A second table, situated nearby, contains larger and more precise scale models of the same building, as well as paper and foam figures, cutting instruments, glue, and drawings. This table provides a distinct presentational state of the building – a state at which *more* is known about it and more actors have been gathered by it. These two tables are part

44   Interview with Carol, November 2002.

of a rich network of mutual representational dependencies. Each borders the other and is part of a continuum through which the scaling venture takes place. The states of 'knowing less' and 'knowing more' about the building are simultaneously maintained within the cognitive unit of the Whitney team. Architects constantly move from one table to the other, i.e. from a small, stabilized composition towards a composition with a larger scope, with greater cognitive and representational power; these movements and flexible connections make it possible for the NEWhitney building to emerge in the architectural office.[45]

The Whitney models are small and large, abstract and concrete respectively, possessing distinct cognitive powers. While the large model deals closely with things such as recalcitrant materials and their properties and adjustments, the small one stands apart from them. No translation is needed to understand the position of a window, an escalator or a plug in the large model of the NEWhitney exhibition hall. However, the meaning of the small model can be grasped only by calling to mind a few evocative features of the building, and tracing out connections between them. While the small model, as a first approximation of the building, has the purpose of facilitating knowledge, inquiry and speculation, the large model is associated with practical concerns. Therefore, since the small model is employed simply as a means *to encourage more thinking*, it is considered abstract; since the big model is used as a means to define figures of the building, it is a concrete presentation of it. However, the development of the practical cognitive power of the large model does not weaken the abstract

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45 This circular movement contrasts with the chronologically successive steps of an evolutionary design process. According to evolutionary theories (see Pye, 1978; Forty, 1986; Basalla, 1988; Petroski, 1993, 1994, 1996) a new design product follows from earlier products through successive functional changes. To elucidate the multiplicity of technical tools and the drive for their improvement, these theories argue that novelty appears through continuously evolving artefacts. They explain how the new design object comes into being in relation to an external factor (social context, cultural atmosphere, economic or political factors, society), being always the starting point of a new process of transformations: that is, a linear and temporal succession of finished and limited events.

properties of the small one. Created in order to know more about the building, the abstract model also aids the architects in achieving concrete results in the large model; regardless of what these results turn out to be, the small model remains an abstract tool for defining and perfecting the NEWhitney building.

After much scaling up and down the escalator is placed in the middle of the exhibition hall in such a way as to enable museum goers to enter the new Whitney gallery; thus the space usually used for circulation is now designated for art display.[46] The decision to move the escalator is triggered also by the museum's requirement to have 'more space for the permanent collection', as well as by the users' expectations of a larger building, the architects' attempts to maintain historical continuity by providing a similar principle of circulation to the one in the old Whitney building, and the museum's agreement that art can be accommodated in support spaces. At a given moment in the process, a few models are detached from the scaling circulation network. They are stabilized at a certain profile and start working on their own, taking new, independent, and straightforward linear paths of development. Thus, the scaling process ends up with 'stabilization' – architects stop scaling and 'fix' the building.[47] Contrary to all expectations, the scaling venture fails to deliver a huge, detailed 'realistic model of the whole' or a mock-up in scale 1:1 of a part of it. Its final product remains instead a particular assembly of a few 'one-shape models' of the NEWhitney detached from the scaling continuum and its circular network, and carefully kept on the table of models.

46   This is related to the concept of 'Experience ©'. Compared with the principles of art display as envisaged by Breuer (neutral) and Graves (competitive to art), Koolhaas' design proposed to blur the distinctions of art and non-art space and merge them in a new congestive formula called 'Experience ©'.

47   I am referring here to the architects' definition of stabilization: a momentary pause in the scaling up and down process, a clarification of the building's profile that slows down the versatile scaling course.

Gaining Knowledge as Architectural Plans Circulate

The NEWhitney building is further defined as architectural plans circulate and become enriched with new data in the daily work of architects, structural engineers, and cost evaluators. Instead of considering the architectural plans as an invariable 'essence' or a 'conceptual table of the building'[48], I will follow their circular trajectory as well as their transformation into numbers, sizes and costs. The trajectories of the plans, their numerical and paper life, provide unusual insights into architectural design. Amid the many interesting design questions, the issue of how plans are mobilized in discussions and negotiations among engineers, cost evaluators, designers and client, and how they are used for calculation and data extraction, remains insufficiently explored in design theory. A full account of these questions, however, goes beyond the scope of this section of the book.

Produced on paper, and reproduced in numerous copies throughout the design process, architectural plans keep a faithful record of it. They partake in the making of NEWhitney as a material support to the design venture (as we have seen in the model-making example). Following the circulation of the Whitney plans, I was able to distinguish two main types of trajectories: (1) between OMA and the office of the structural and mechanical engineers Ove Arup in London; and (2) between OMA and the office of the cost evaluators DCI in California. The plans travel also to the offices of other contractors, to the client, and the office of the local architect DBD in New York.[49]

48 I am referring here to Le Corbusier's definition of architectural plans (see Vogt, 1998).

49 As the building requires a variety of issues to be explored related not only to technical feasibility but also to constructability, buildability, availability, and market conditions, architects engage in many contractual relationships with other partners from the very beginning. As a result, they involve all the parties that contribute to the design and the construction of the building as early as possible. This collaboration with other actors (*contractors*) in the very early phases of the design process allows them not only to think about architectural and engineering solutions, but also about

Here I will trace only the most frequent trajectories of the plans, connected as they are to valuable cognitive changes. The main questions that will guide me in recalling these trajectories are: what is gained and what is lost in the travels of the plans, how do they change and what kind of modifications do they trigger? The fact that architectural plans travelled very often from Rotterdam to London and back again, gives us the chance to outline the profiles of other actors in design process – the structural and mechanical engineers, who were engaged in an intensive collaboration

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construction and process-related solutions at the same time. This creates an awareness of the difficulties they will face and the degree of feasibility, and introduces a reality check when the actual realization of the building is taken into account. The exchange with the different contractors is always mutual, since the contractors *learn* about the architectural assumptions, and in exchange the architects *learn* from these contractors, each of which has a different competence, about the structural, mechanical and construction parameters. At the same time this exchange informs the architects about the strength of their design schemes and makes more intelligible the project's advantages and disadvantages.

DBD is a New York firm with a solid track record of building in New York City and significant experience in dealing with the kind of complicated design issues that faced the NEWhitney. DBD acted as a valuable advisor on the project, consulting architects from OMA on local issues regarding city politics, historical buildings in New York, and Landmarks issues, as well as on tiny, but strategically important technical issues, such as what size the rooms should be to satisfy the Landmarks Commission, what kind of stone is used for the Whitney's windows, and how to restore it. As local architects, they followed closely the design progress of OMA, and often sent their staff members to oversee and take part in the design process. Entitled to take responsibility for the building when the NEWhitney models move to New York during the construction phase, and to carry professional liability together with OMA, they served as a valuable source of local knowledge and practice, and provided connections to various departments and sources of information. Architects from OMA developed the Whitney project in close collaboration with their New York partner. As Ole argued: 'We are not interested in the classical model of design architect and executive architect where the designer does the design and hands over a package and the executive architect then interprets and adds details to the design, and implements it. So, there is a process of rewriting the story, and we are really looking for people that have been involved since the beginning and who keep us involved until the very end' (interview with Ole, September 2002).

with OMA at the time of my ethnographical observation. 'Intensive collaboration' means for the architects the regular presence and intervention of engineers in the ongoing design process, as compared to many offices in which engineers intervene only at the very end of the process to execute the plans of the designing architect. Even when engineers are not in the office they remain in touch with the architects, exchanging fax messages, spending hours discussing the building on the telephone, sending information back and forth between London and Rotterdam. One can sense their weekly presence in the office, and see the tangible results of their interventions and discussions with the architects on the plans and the drawings.[50]

Once in the office, engineers engage in active discussions about the actual design plans, discuss the overall building concept and structural approach, comprising issues such as the implementation of the mechanical systems, environmental control, stability and vertical support. Thus, they engage in assumptions and predictions regarding different scenarios for the NEWhitney's structure that will correspond to the concept. It is an even-handed dialogue between architects and engineers, in which architects display the latest plans and models, the engineers give the architects certain information to be implemented, and the architects check it and come back to them. Thus, they engage in negotiations regarding concepts

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50   There is a tradition of collaboration between OMA and the engineering company Ove Arup in London. The two offices had a very intensive phase of collaboration in the late 1980s and in the early and mid-1990s. A quieter period followed in late 1990s, but at the time of the Whitney project the two offices were again starting to engage in much more active field of communication. The engineers from Arups were coming from London at least every two weeks, and sometimes every week, and were spending time at the OMA to work on one or two specific projects in progress. In addition, they were also spending extra time on smaller projects as advisors, and were involved in competitions together with OMA architects, participating in design on an equal basis. There were two types of Ove Arup engineers involved in the OMA projects: mechanical engineers, in charge of all electrical and plumbing issues, as well as air conditioning and storage space, and structural engineers mainly concerned with the problem of how the building will stand.

such as 'how the building works', 'how much space it takes up', and 'what the concept of the circulation is'.[51]

> SARAH: 'So, we have the exhibition space and they [the engineers] tell us to retain this much for the electrical closets and mechanicals traps. Basically what they were saying is that they *need this much space for the equipment*.'
>
> EREZ: 'Yes, that is also where the *negotiation happens*, because they [the engineers] tell us, "*we need this much space*" and we say "*well, you only have this much*", which is usually what happens, because they need more space and we squeeze them. But that's the way it goes.'[52]

Engineers rethink the structural and mechanical aspects of the design, while trying to preserve its main features. While designers look for new ways of accommodating the exhibition programme and hosting a bigger portion of the Whitney's permanent collection, structural engineers seek an adequate space to integrate the mechanical and electrical aspects of the building, the air-conditioning, and the plumbing. In this 'bargaining' for space, each side attempts to find a creative way of accommodating both the programme and the mechanicals. The ways these systems 'run through the building' and are made visible in its very texture can contribute to the rethinking of the design concept as much as the concept can stimulate new ways of integrating the mechanicals. In these discussions, engineers show a good deal of 'interest in and understanding of architectural issues' and enjoy working on unusual solutions that 'go beyond standard limits'.

51   For more on negotiations in design see Bucciarelli, 1994, who argues that design venture is a process of achieving a consensus among the various participants with different 'interests' in the design, which derive from their technical expertise, experience, and responsibilities. Thus, design process is necessary social and requires the participants to negotiate their differences and construct meaning through direct, and preferably face-to-face, exchange. Participants in design achieve in the process of designing a socially constructed shared vision of the artefact-to-be – how it is to be made, how it will work, how much it will cost. Like Bucciarelli I account the negotiations in design, but I show in addition how a variety of non-humans take part in these negotiations and redirect the course of the design process.

52   Discussion with Sarah and Erez, June 2002.

Using the models, drawings and diagrams, engineers and architects engage in brainstorming sessions together. They attempt to interpret the plans in such a way as to suit both the architectural ambition and the latest functional inventions that can be utilized to redefine the structural integrity of NEWhitney. Plans and sections are the main mediators in this dialogue. Architects send the plans to the engineers (at the beginning they often also send photographs of the first models and in some cases even the models themselves) with the hope that once they 'get the structural elements [from the engineers] they will *know more about the building*'. Engineers from Arups try to extract from these materials information that is not immediately apparent and sometimes not obtainable with architectural tools. This information then returns to the architectural office, together with the plans. Often, in exchange for the plans, architects receive tables with numbers and dimensions that are incorporated into the plans. Thus, the plans flow to and fro; they are faxed and scanned and commented on over the telephone; they are the sum of every single trace of discussion and negotiation among the engineers and architects, and are continuously updated with new data about the structural and mechanical parameters of the NEWhitney.

I followed Sarah and Erez in their communications with Caroline and George from Arups. They call the Arups engineers almost daily to discuss the latest changes on the Whitney project. They often engage in telephone conference sessions; with the plans in front of them on their desks they can draw on them as they talk, taking in the new numbers communicated by the engineers from Arups.

> We really need to see how this information will change our plans, and then they will send them back to us, and will say: 'that's impossible in that point or in that point, and we need to rethink'. At some stage it's better when they are here, *so we can really think together and see the model*; there are stages in the process like now when they are working alone and just come here from time to time. If we have to talk too many times per day it's easier for them to come here. There are stages in the process when it's better to work closely with them.[53]

53   Interview with Erez, July 2002.

As structural parameters and numbers flow to and fro, the architectural plans become enriched with more and more features, becoming ever more detailed and structure-specific. After a telephone conference with Caroline and George, Sarah and Erez write down the numbers that have been given to them and look at the plans together to figure out possible changes in design; they say: 'now, we *know* enough'. This means that new data has been gained through the process and added to the existing plans, thus leading slowly to the definition of the NEWhitney. This new knowledge, extracted through the daily circulation of plans, differs from the data obtained from the models: it is a 'what' knowledge, not a 'where' knowledge.

Architectural plans are also sent to the building's cost evaluators, a company called DCI, based in California. If in the engineer–architect exchange the plans are transformed into numbers that measure structural property, stability, stiffness, robustness, resistance, and stress, which once incorporated into the plans trigger changes in design – in the cost estimator–architect exchange, the plans are transformed into numbers that correspond to dollars. The communication with the value engineers will lead to an overall cost model, which in turn can influence the design with new cost solutions.

The value engineers from California knew the Whitney scheme B only by the plans, and saw it for the first time when they came to the architectural office in September 2002. The first thing they did when they came was to try to understand aspects such as what is going on at each level of the building, what is new in scheme B. They showed a lively interest in design issues, and in the public trajectory of the project, the publicizing of it, and the design precedents. Together with the architects they looked at the plans again, trying to identify the different versions (updated and actualized), clarify some measurements, and adjust the different metrics according to which they were produced in the two engineering offices. They compared at the same time numbers, structural elements and ways of calculating.

> We *convert the areas of the programme into numbers* [costs]. This one, for example [points to the plan], and then we price it up according to the type of space. And then we code each space according to the cost model. I mean, we price them according

to structures, finishes: frames and walls that are not seen. And, then, also according to all the fixed furniture in the space, the mechanicals, high protection, electrical. Then, we start looking at the bottom of the cost model and we look at the square foot foundations; then, we move onto the acoustic elements of the job. Then the size requirements, the exterior's scheme, stairs, elevators, plumbing, all the heating equipment is basically down here, electrical; and this takes us up to another level of costs, which is here [points to the right hand side of the plan]. And I am coming to the particular GCC [general conditions costs], the performances. *As we get through the jobs, it gives you new data*. And we have to start from what the architects together with the engineers have done and to *convert* it into a philosophy of measuring which encompasses everything they need. We also include an allowance of 10 per cent. As we go through the other stages of the job, we will reduce that, as *more and more information comes up*.[54]

The cost estimators *learn* from the architects and the structural engineers and from the plans; every new trace made on the paper plans during the discussion process is then rapidly transformed into numbers. Negotiations between architects and the DCI people take the form of question and answer sessions, in which the architects ask, 'What if we do it like this?' and the DCI experts answer, 'It will cost this much'. They look at the plans together and start changing them slightly: new lines are drawn on the plans, and then transformed into numbers through various mathematical formulas and parameters; after the calculation they are added to the cost model on the computer. Thus, the cost evaluator's small calculating machine becomes the mediator between the lines on the plans and the cost model. Without this instrument, the mediation between image and data would be impossible. Once the calculation is completed according to the new traces on the paper, the numbers appear on the screen and then are returned to the architectural plans as new numbers and measures. This is how the paper plans mediate the conception of the NEWhitney's numerical cost model.[55]

54 Interview with a DCI expert, September 2002.
55 Although DCI could have communicated directly with the client to perform an evaluation of the budget before the selection of an architect, this was not done in the case of the NEWhitney. Therefore, every attempt to redesign the building extension was related to new cost estimations and budget reassessments.

All the actors meet over the plans, draw and calculate together and inscribe new lines and numbers. Gathered around the plans, the DCI people argue with numbers, the structural engineers talk in terms of sizes, sketches, length and structure; while architects discuss with visual tools in hands. The same plans are simultaneously present on different tables in the office: on the 'calculating table' they reflect new calculations and drawings; on the 'model-making table' they are used as a material matrix for the creation of scale models. Since they are used differently on the two tables, they create a different type of disorder on each one: the engineers' table is a mess of plans, calculators, computers and numbers; the models' table is full of paper plans, foam, cutters and plaster. In the first instance, chaos arises from the loss of one's calculator under the pile of paper plans; in the second, the loss of a paper cut or a pen cutter can cause confusion. While the plans on the first table overflow with new lines, numbers, calculations, notes and refreshed data, on the model-making table the same plans undergo a more radical physical transformation as they are cut, adjusted and pasted.

Like the plans, scale models also play an important role in the discussions between architects, engineers and other contractors. Discussions are guided by and revolve around the physical space created in the vicinity of the model staged on the table: all participants in design touch it, point at it and stare at it while drawing the structure and calculating it. Through these interactions the models provide the architects and engineers with more information, and the human actors respond to the models. As models can be discovered from different sides, architects and engineers literally turn around them. All traces from the collective discussions are incorporated in the models, thus helping to solve problematic issues debated by the participants in design and stabilize the latest decisions in material form. Scale models also aid the production of the structural model, conceived by the structural engineers, and the cost model, designed by the value engineers. Both of these are produced according to the changes in the physical models. After every discussion the intern Narjit is asked to make a model in order to visualize immediately the very latest changes in the project and capture the new ideas and data obtained in the discussions. A structural change of 8 feet, for instance, is swiftly visualized on a physical model so that all actors can 'see what it really looks like'. Then it is translated into

costs. Through the models design changes are made quickly accessible to all the architects in the office who take part in the development of the NEWhitney project.

How is a Building 'Obtained'?

It is not by chance that in the analyses of the different processes of knowing the building I used reiteratively a term commonly used by designers at work – 'to obtain a building', instead of 'projecting' or 'anticipating' it. That is how architects from OMA describe the way a building first becomes visible, present and real in the office. Anticipation means that the emergence of the building is expected and foreseen in advance; it is strictly planned and architects are prepared for it. They know what is necessary for the building to happen, without relying on unexpected and randomly occurring events to intervene accidentally in design. For the visuals to anticipate the building would mean to imagine it and to create it before the building becomes real. Achieving or obtaining a building points instead to another attitude to design. For a visual (model or diagram) to 'achieve' the building means that it is possible to bring about a building – by making numerous visuals of it and imagining it while making them, thus obtaining both models and building in the process. Thus, through the trials with visuals the building becomes more and more thinkable, more 'obtainable'; it is possible to get it, to achieve it. And if a visual obtains, it exists, and it triggers effects. As seen here, a building is not obtained in an astute double-click moment of invention, but through numerous little operations of visualization, scaling, adjustment of materials and instruments.

The follow up of the design process shows that design's distinctive feature does not consist of projecting a reality into the future (although most of the architectural products are known as *projects*); it is not a venture of anticipating and foreseeing with precision the specificity of a building-to-be. Design is equally driven by numerous 'backward moves', witnessed in the design enquiry with visuals. Striving to 'obtain' the suitable shape of

the NEWhitney, designers from OMA repeatedly went *back* to history to evaluate previous design interpretations of the same architectural objects, requirements and given conditions (Chapter One) and the specific social trajectory of the building (Chapter Two). During the visual trials with materials and shapes numerous study models, try-outs and options of the extension have been generated, kept and staged on the tables of models in the office so as to make possible that architects *get back* to them in the process of design to discover the indefinable 'something'. Thus, to design means stepping back in order to be able to *re*design. Instead of departing from a well-informed and predictable historical enquiry that would be later on incorporated in and would serve as an inspiration of clever design solutions, design process manifests its nonlinear course. Architectural conception appears as being guided by 'drifts', and driven by 'ruptures' and 'modifications of details'.[56] Designing a building requires much more skil-fulness, craftsmanship and obsessive attention to the minute details than it relies on the flight of subjective imagination and the grand gestures of emancipated creativity. Architecture as a practice takes place within the interactive networks that comprise human and non-human actors and constitute complex social spaces organized through a variety of communicative and productive activities.

56   This argument stands against the well-established view in design theory that the process of design and planning takes place in a *finalized space*, having a strict economy of goals and means (see Boudon, 1991, 1992, 1999; Buchanan, 1995) and is intentional and directed by clear objectives, but never unexpected, and involuntary (see Lebahar, 1983; Rowe, 1987; Shoshkes, 1989; Allen and Agrest, 2000). It is considered that design practice is of predictable, anticipated and intentional nature, the foreseeable constraints (expected, carefully calculated and estimated) are in the core of the architect's professional expertise (see Raynaud, 2001).

Multiplying Options, Meeting the Public

Figure 13: The table of options (© OMA)

After a meeting with the client in May 2002, design scheme A was considered to be too expensive and a design with a smaller budget had to be produced at short notice. Architects engaged in a process of cost-cutting investigations, a process that changed and redefined every single part of the building from a budget perspective. This was an exercise that some

architects defined as a 'diet' exercise: *fitting* the building into the new budget
requirements of the client and scaling it down, as Graves did many times
in the 1980s. Architects define this venture as 'an option process', a proc-
ess in which they guess, assume and bet on what will save money. I made
an ethnographic study of this tentative design exercise in the summer of
2002. Over the course of a couple of months the NEWhitney building
(scheme A) was split into different parts, and a detailed cost evaluation
and reassessment of the museum's needs and parameters were carried out.
As the design developed, a variety of new models appeared on the table
of models and new scenarios for a cheaper NEWhitney were elaborated.
Some models from the old Whitney collection disappeared, while others,
new and astonishing, joined the table of models and remained there until
September. As we saw it also in the previous chapters, architects do not
produce 'one huge realistic model of the whole', one successful prototype
that will endure throughout the design process and be gradually trans-
formed into a building. The NEWhitney exists as a collection of different
scale models, of different options, that are changed and reshaped many
times as the design develops.

   In this chapter I will follow the process of generating numerous alter-
native scenarios for the building, called 'options', as well as the tentative
venture of stabilizing the building and its interpretations through the col-
lection of visuals staged on the office tables. I will also focus on the vari-
ous techniques used by architects to make the models talk and act, and to
provoke reactions in the participants in the design – the client, engineers,
contractors, proto-users – whose complex networks extend and prolong
the work of the architects. I will show how they gather around the tables
to evaluate the various options, compare design scenarios and judge the
alternative design schemes.

   The table of options and models contain traces of the design opera-
tions of modelling and scaling, and form an important environment for
the organization of the team's cognitive activities at the OMA (as seen
also in Chapter Three). It is impossible for the architects from this office
to imagine the building without having all the models and try-outs on the
tables. All changes are made with the materials left on the tables, as the
building emerges out of the multitude of presentational states. Just as they

make the Whitney team's cognitive moves visible, the models also render the building accountable: exposing options, possible scenarios, failures and design decisions. As architects move from one table to another, they pass from the small model to the large one, from the tiny detail to a larger spatial arrangement of the designed museum, from the placement of an escalator or a painting by Hopper,[1] to the overall circulation principle, mechanical engineering, and the philosophy of artistic display. The arrangement of models on the table (as seen in Figure 1, Introduction) corresponds to a frozen picture of the Whitney project, where the building becomes visible, a plural distributed in the shape of each of the models, obtained through the connections of the adjacent images and prototypes.

Deploying Scenarios

Regardless of the individual knowledge of architects from the Whitney team about the NEWhitney project, they all engaged in modifying the models and making new assumptions about the building. New options were created according to strict parameters of programme, circulation, and the new budget restrictions, instead of following a random process of experimentation and multiplication. Options were meant to allow the architects to rethink the given conditions, test the building against the changed parameters and, as Sho put it, 'to see how far they can go, and how many changes they have to make to carry out each option'. The option process is not conducted only for the sake of multiplying the building's potentials, but also, as Rem stated in a team discussion, because 'creativity

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1 The Whitney is famous for possessing a huge collection of paintings by the realist painter Edward Hopper. It began showing his work in the 1920s, when he was young and not so well known, at the Whitney Studio Club, the Whitney precursor, and continued to exhibit him at the Museum itself. Today, the Whitney holds the world's largest collection of Hopper's art – more than 2500 oils and works on paper.

comes from the exploration of all possibilities'. He advised the members of the Whitney team: 'You should explore what is possible at all levels. Otherwise we are tied to one possibility only!'

> *A list of options*: 1. Retain brownstones; 2. Auditorium in new building; 3. Auditorium in brownstones; 4. Facade retention only of brownstones and Gluckman;[2] 5. No sub cellar at brownstones and at new tower; 6. No work at Gluckman; 7. No work at Breuer; 8. Facade retention only at Gluckman; 9. Elevators vs. escalators; 10. Facade retention only of brownstones; 11. No sub cellar at brownstones.

Starting with a 'what will happen if ...' query, each option questions an already stabilized interpretation of the NEWhitney ensemble: the Breuer building, the brownstones and the new tower. One option for architects from OMA was to rethink different possibilities for intervening in the Breuer building:

> *What will happen* in the basement *if* we change few things in the Breuer itself? *What if* we just keep it so that there is no work in the Breuer? *What will happen if* we go to an existing building and start demolishing and adding new parts? Right now we are looking at *all these combinations and permutations of 'this with this, and that'*. For instance, there might be five things you can do, but the fourth thing and the first thing fit together, etc.[3]

As we saw in Chapter One, the NEWhitney scheme A aimed at creating an ensemble of three buildings in which each is transformed by and adjusted to the other buildings in the ensemble. The seventh option in the 'list of options': 'no work at Breuer' tries to figure out what the extension would look like *if* the Breuer building is not submitted to any modifications at all. This could turn to be a cost-effective scenario.

'No work at Breuer' means:

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2   The 'Gluckman' designates the renovation of one of the brownstones realized by the architect Paul Gluckman in 1996. He removed all the mechanicals from the Breuer building and added permanent collection space in the portion previously occupied by offices. The Gluckman extension was discussed in more detail in Chapter One.

3   Interview with Alain, July 2002.

1. 'No auditorium'. The auditorium would be moved into levels seven and eight of the new tower so as to eliminate the cost of renovating the Breuer. The consequences of this would be that when the auditorium is relocated to the NEWhitney, the exhibition programme would be replaced by auditorium activities, while the increased numbers of visitors on the upper floors would require wider staircases.
2. 'No opening from Breuer'. The pass-through elevator east of the Breuer would be eliminated, thereby retaining the shaft as it is. This would mean that the circulation between the Breuer and the NEWhitney would be limited to only one opening.
3. 'No plant room reconfiguration at level 5.5'.
4. 'Plant to be relocated'. If the plant room is moved to the new tower some programme area would be lost to mechanicals, while if it is relocated to the roof of the Gluckman some neighbourhood objections would be expected.[4]

Although these changes might save some costs, they alter the interpretation of the entire NEWhitney ensemble. They also change the very meaning of *addition* as it is defined in the first OMA design. If 'no work at Breuer' is needed the old building would remain unchanged, and a new part would be added. In this way the binary logic of old-new will be maintained, and that is exactly what the Koolhaas scheme tried to avoid. Through these options the NEWhitney is fragmented into separate scenarios that redefine the major issues of the initial design. Every option creates a series of changes and tries to imagine the possible alterations to the overall concept, and it does so in minute detail. The 'What if …' question, is, however, not a rhetorical move. Its answer is unknown for architects at work. And as it is a cost-saving exercise, the implicit question remains: Would this move lead to a reduction in the total cost of the building? Yet architects learn the answers to these questions only at a later stage of the design process – after testing the options, and after gaining additional data

4   OMA Archives.

from engineers and cost evaluators about what these alternative scenarios mean for the building.

Designers from OMA explore a variety of options, even those that have been already considered extremely damaging to the Whitney, such as 'to retain the brownstones completely' (option one in the 'list of options'):

> This option is probably the one that is most detrimental to the building, to the concept, to the circulation. If we retain the brownstones completely, if we do not demolish any part of them, *it means* that the footstep gets reduced. And that *means that* the structural implications and the structural concept both have to be revised, because the size of the base would change, as would the size of the foundation. And also we would have to rethink all the issues of the circulation and the way you get into the building and the way you move around the buildings, because if we retain these brownstones entirely it would mean that the escalators that go along the building would no longer work.[5]

This option assumes that the brownstones should not be modified before being integrated into the new ensemble. We can also see from it that one simple change in the initial configuration of elements triggers a chain of tiny alterations right up to rethinking the entire circulation concept of the addition. The circulation principle, as seen in Chapter One, was considered by designers from OMA to be one of the main mechanisms for maintaining the specificity of the Breuer building. It was supposed to be carried on into the new addition. Thus, by immersing themselves in the meticulous option process, designers again engage in a process of re-interpreting and re-defining the Whitney's meaning.

The given conditions defined in OMA's first design proposal also underwent numerous changes. The stipulation 'to retain the brownstones', crucial for Koolhaas' theory of addition, is multiplied during the option process into mini-scenarios, such as 'partial demolition, partial basement', 'maintain all but non-contributing', 'demolish all but the facades, and rebuild', etc. These very different scenarios also triggered a whole raft of interpretations of the given conditions.

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5   Interview with Erez, September, 2002.

> What we propose is to go below that level. This is the new part, right? So, we can go to -30 feet, but these existing buildings probably only go 20 feet below ground. So we would have to change the foundations over here, and the foundations and the excavations are the most expensive things. Because you have to keep the walls, you have to support the walls somehow, and then dig below, and then, when everything is cast, you remove the temporary supports, and it's just too much of a laborious process. You have to underpin the wall. And it's complicated.[6]

Thus, the retention of the brownstones would mean their partial demolition and substantial changes to the foundations of the building so that a larger part of the footprint can be used for the extended Whitney. This option also delegates to the single architectural element of the brownstones' facade the responsibility of maintaining the historic fabric. As they create new cost-saving options, architects reflect again on what it means to maintain the historic city fabric. The connections with the surrounding buildings are analyzed here on the micro-technical level of the construction: connections at the sub-cellar levels, the foundations and the facades of the buildings. The option 'to retain the brownstones facade' develops a new scenario for combining parts of the new and parts of the old in an addition: the old brownstones are kept by virtue of their external appearance, but are substantially modified inside and made new. This also shows the technical difficulty of preserving portions of the old brownstones, and altering them in order to be integrated into the NEWhitney complex.

Thus, the 'option process' is a repetitive venture of changing and redefining the models, and consequently the very meaning of addition and of the buildings involved. It is a means of rethinking the actual building on the basis of scale models kept on the table of models, *going back* to previous design moves realized at the beginning of the design process, then measuring the difference between the not-so-distant past and an ever-changing present – a move that is reminiscent of the vector of reinterpretation of the Whitney building as described in Chapters One and Two. The models-to-building transformation can be also followed in the option process: architects deploy new scenarios for the building-to-be in

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6   Interview with Alain, September 2002.

the same way that former Whitney architects did in designing extension projects. A *series* of design projects was also produced, for example, after a similar 'option process' in the Graves architectural office in 1987 and 1989, when his design plans from 1985 were subsequently re-evaluated in order to re-assess both the budget and the architectural parameters. Starting with a new combination of concerns and requirements, architects at OMA modified entirely the collection of models that were presented to the client at the beginning of the NEWhitney design process, and by doing so redefined the most important features of the building extension, and the very meaning of *addition*.

Although the option process begins with a number of assumptions that dismantle the stabilized collection of models and add numerous new models to the table, architects do not produce an unlimited number of scenarios. Rather, they generate only the ones considered to be the most probable, and it is with this first restriction that a pre-selection of possible design moves is outlined. The options are later reduced following the interventions of the cost evaluators and structural engineers, and finally, after the client's feedback. So, we can witness a two-step process: (1) multiplying the scenarios for the building (scaling up as Graves did in his first proposal in 1985); and (2) progressively scaling down, making the design options more specific, adjusting them to the parameters, and making them fit the given conditions (as Graves did subsequently in 1987 and 1989).

Most of the Whitney team were reluctant to make changes and felt 'emotionally' attached to the existing design, believing as they did in its 'perfection'. Blaming the client for having provoked the 'option process', the Whitney architects even declared themselves unable to design 'a comparative scheme' for the Whitney and repeatedly claimed that the original design was the best one and would remain the most developed proposal. They even viewed the option process as being nothing more than a deliberate strategy aimed at demonstrating to the client the disadvantages of other options when compared to the existing design, showing that a variety of possibilities have been explored and the best few options discovered, and proving that 'a lot is wasted when costs are saved'. Others remained optimistic and believed in the option exercise as a process that could lead to the building realization: '... we do this exercise in order to make this building happen. It's

not just a matter of being polite to them [the clients]. I hope it will happen and now we are really excited. Again, it's a different process, dealing with a lot of numbers and more details, and it's nice. And we learn quite a lot. It's fun: new people, new competences, everything is new. I want to finish Whitney; I don't want to work on other projects ...'[7]

The option process is also meant to prepare a *show* for the clients to enable them to see and understand the Whitney scheme, as well as to make the building intelligible for the architects in the team. It was a laborious strategy for convincing the Whitney Board of the advantages of the actual scheme, since the option exercise also attempted to prove that every element of the existing design scheme was worthy of inclusion and could not be easily changed without overlooking other aspects of the building and the very meaning of its addition. It was defined by architects as a *feasibility study*, which deploys architectural thinking, displays comparative accounts, tests the feasibility of the concept, and creates arguments about 'intelligent' design. Thus, the various options are meant to make a statement as to whether the building is *feasible*, and *argue* about the meaning of building extension.

In addition, thanks to the option process, the client was able to witness the *process* of defining and redefining the Whitney: the behind-the-scenes development of architectural cognition and the successive design steps in the models-to-building venture. In the studio and on the table of models, the building appeared as a controversial piece, a disputed assemblage of issues, concerns, and possible scenarios, defined and redefined with pros and cons, gains and sacrifices. At the same time as designing architects were engaged in option-making, the client engaged in a process of reassessing the actual museum's needs. As one architect put it: 'when the client changes things, you have to change the building as well'. The client of the Whitney changed its requirements and concerns many times, as did many other protagonists in the Whitney story, and remained actively involved in the option-making venture, generating new concerns and evaluating the options.

7   Interview with Erez, September 2002.

Stabilizing, Eliminating

Although the process of multiplying options for a cost-reduced building accelerates tremendously as the design develops (that is, at least, the impression an observer of the option exercise would have), their number does not increase in an arbitrary fashion. The deployment of a few particular options, as in the examples listed above, already denotes a preliminary selection and a reduction of possible scenarios to modify the building, including assumptions regarding what can and cannot be changed. Reduction does not come after-the-fact, as a secondary procedure of rational decision-making. Rather, it goes hand-in-hand with the process of generating the options; it is continuous and conterminous with it. Architects work out and present only few out of a hundred possible options to the other members of the team; they often apply the same method of options development to their individual design work – that is, they develop a few options that serve as design aids in the process of articulating them before discussing them with the other Whitney architects. Thus, production and elimination of options happens at every single level of design: (1) when an architect works on the options alone; (2) when the Whitney team gathers and discusses the options; and (3) when the few successful options are solemnly staged on the table of models and presented as huge images on the office walls, and are then collectively discussed and reassessed by OMA architects. A manageable number of options, rather than an overwhelming array of scenarios, is kept and circulated at every stage of the project development, programmatically analyzed and subsequently tested.

Sho describes this process of changes as one in which different elements are progressively dropped while something invariable remains – the extension concept. It is a process of continuous reinterpretation of the Whitney, as every option is judged and evaluated according to the changes it entails and the degree to which it modifies the initial interpretation of Whitney as stated in the first design proposal. This is also indispensable for the production of more articulate design scenarios, argues Erez:

> Yes, but also we need to find the line, because if you *have too many options you can*
> *never find your way.* That's what we are trying to do now. We have eleven options.
> It's too much for the client to understand the *differences* between each one of them.
> I am sure that when we get some cost input we will be able to *reduce these options*
> *to five or six, something more manageable.* We are trying to build the matrix with
> all the information about the options. But if we have too many options, too many
> parameters, *we will not be able to see*.[8]

The graspable ensemble of options has also to be rendered eloquent, as it is meant to communicate the differences between the distinctive scenarios for changing the building. Thus, if the ensemble includes 'too many options' these differences will remain imperceptible and the viewer (client or visitor) will never be able to find his way through the various possibilities, and, moreover, will not be able 'to see' these scenarios as being different. The various types of input in design (from the cost evaluators and the chief architect) will provide designers from the Whitney team with more criteria for differentiating the options, thus rendering the scenarios more specific. The chief architect intervenes in the team discussions with newly informed results 'to overthrow or re-inspire the option process'. As Ole argues, 'That is quite often what we do. It is a way of continuously challenging not only our client, but also ourselves.'[9] After Rem's intervention new options flood the tables of the Whitney team, while some of the previous scenarios are sent to the archives; again, production-and-reduction guides the process.

In addition, further parameters are introduced by the client: 'We need a lot of *input* from the client at this stage. What we are doing now for the next meeting in July is a clear presentation of all the options. The purpose is *basically to give the clients tools to decide.* And then, *they give us input*, and then we are able with their input and our knowledge about the options to make one good scheme that would produce a good building.'[10]

Architects and client exchange options and inputs. By 'input', architects mean information about any changes to the given conditions, and

8   Interview with Erez, June 2002.
9   Interview with Ole, September 2002.
10   Interview with Erez, June 2002.

any redefinition of the client's requirements. These new concerns and updated given conditions will trigger a new production-and-reduction design process. Once the differences among scenarios have been articulated more fully, the options generated will help the client come to a decision. The options are also evaluated by cost engineers from DCI and structural engineers from Ove Arup, and are thus enriched with more specific data, which make the architects 'know them better' and which at the same time help to differentiate the options to a greater extent. At this stage, again, when the differences among options are made more visible, some of the scenarios are considered to be 'too expensive' or structurally unfeasible, and are dropped.

Figure 14: A reduced number of options (© OMA)

Thus, after every input from the chief architect, client and engineers, some options are forgotten while others emerge and are staged on the table of models (Figure 14). One can see that the option process develops by following a cumulative itinerary of small evaluations, reductions, and reassessments

that leads slowly to a smaller number of good options, and with time, triggers a better scenario for the building. The production-and-reduction part of the option process involves meticulous work on the minute differences between options. Later, those options that endure and are included in the small ensemble of successful ones, will generate bigger cost differences and will be submitted to further evaluation by proto-users.

These subsequent evaluations by client, chief architect and engineers are at the same time procedures for producing and generating new options, since the parameters for evaluating them emerge in the course of their creation; the same parameters also serve as the criteria according to which their number is reduced. Thus, when we say that production and elimination go hand in hand, it means that the same conditions that generate new options will also be the ones that make them disappear from the design agenda. The reduction of options is viewed by architects as being possible only from the stance of 'looking back': 'It's basically when you *look back*. You can never look forward. You cannot really anticipate, and predict.'

If exact anticipation and prediction of the successful scenario for a building-to-be was possible, designers, engineers and client would never engage in the long and painstaking process of option making, progressing only via jumps and disjunctions, elimination and new production. None of these actors has free choice in deciding the options (and we will see this again in the process of public presentation in the last section of this chapter). The option process develops as a move *backwards*, back to the palette of possibilities, and a deliberately augmented range of optional scenarios for the building extension, and then a move *forward* to the actual design dynamics, measuring and calculating the differences in the same fashion as we saw it when architects engaged in a retrospective design enquiry (see Chapter One).

As the various actors intervene in the option-making process and express concerns according to which the options are created time and again, new models are generated accordingly. The models kept on the table represent the materialized state of the collective nature of design and its highly experimental character. Options enable models to become more articulate, to illustrate different solutions to a problem, to generate different answers to a question, to make statements and to argue differently. Every

single option presumes that 'the building will act and look differently'. The
option process is reminiscent of a chess game, in which the figures remain
the same but the moves vary: 'Not touching the Gluckman will save a lot
of money',[11] 'putting the mechanicals in one part of the building will save
more than putting them in another part', etc. Positioned differently accord-
ing to each option, the 'chess figures' configure new possibilities for the
building, and by doing so generate new repertoires of actions. It remains
difficult to predict the exact consequences of moving these figures; through
the option process architects can only assume, bet, guess and suggest. Only
after the collective evaluations and design modifications are completed can
the options and their effects be fully perceived.

Thus, triggered by the client's input, new cost-saving options were
extensively generated and assessed, leading to a cheaper design scheme,
which was compared with the first, more expensive scenario and discussed
by a variety of protagonists. Despite being cheaper, the second scheme was,
however, also declined by the client for reasons unknown to the Whitney
team. In July OMA architects began to design an entirely new scheme –
B – a block-building structure at the same height as the Breuer building,
intended to be built in place of the brownstones and to maintain floor
connections with the Breuer:

> I don't know what happened at that famous meeting when they suddenly decided
> that scheme A was not good enough, or too expensive or whatever. But at that meet-
> ing they had a verbal brief, not anything that I've seen written down: 'Ok, we have
> to have a building at the same height as the Breuer, no brownstones, floor extended,
> etc.' So, it was a basic assumption since July that we could start from the given condi-
> tion 'Let's take the brownstones down.' There wasn't any discussion about that. The
> discussion in this case was about keeping the Gluckman brownstones.[12]

11　　The reasons for following this option are (1) the Gluckman has greater historic value,
　　　and therefore the buildings mean more to the Landmarks Commission than the
　　　Madison Avenue brownstones; (2) it is considered more valuable by the neighbours
　　　since Gluckman is part of the neighbourhood fabric; and (3) keeping the Gluckman
　　　means that the offices can be kept open during construction.
12　　Interview with Erez, September 2002.
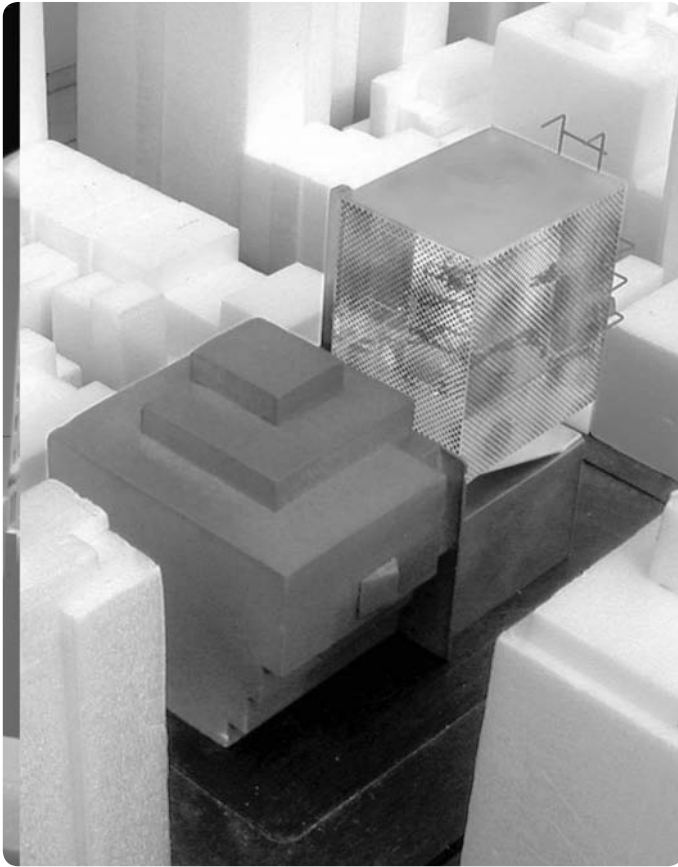
Figure 15: Scheme B of the NEWhitney (© OMA)

Scheme B, seen in Figure 15, had to start with different design assumptions and client's given conditions. Thus, the interdiction to demolish the brownstones was translated, as in Graves' time, into 'Let's demolish the Madison Avenue brownstones'. Moreover, the same requirement, which triggered ferocious debates in Graves' time and which was widely discussed in the first Koolhaas scheme, was now taken to be an unproblematic condition since it was the only way to produce a design that would *differ*

considerably from scheme A.[13] The new scheme did not replace scheme A, but rather stood alongside it, by way of comparison, sharing office space with the (already) old NEWhitney models, and attracting the attention of architects and clients. Instead of the new one replacing the old, as happened with Graves' projects (the 1987 scheme replaced entirely the 1985 one, and was afterwards replaced itself by the third proposal in 1989), the two NEWhitney schemes were placed side by side. They stood not as two competitive design proposals the client had to choose between, but in a comparative setting, in which the new scheme would be given the chance to prove its validity.

The new scheme stands next to the old one on the table of models so as to allow architects and visitors to measure the differences between the two designs and validate the distinctive approaches. As the first scheme has gone through more development than the second, which had to accommodate rapidly the latest cost changes, the two schemes can only be compared indirectly. Here we find again this *backward move* in design as being crucial to Koolhaas's approach – to go back in history, to assess the previous design proposals of Graves and Breuer, and to measure and evaluate the differences between these design solutions and the OMA design in an even-handed manner (as seen in Chapter One). To design a scheme B means to redesign entirely the initial scheme A and make them sit together in the repetitive continuum of design venture. B does not come after A with a linear logical step-by-step move. Every subsequent Whitney extension project, instead of ignoring the *difference* between the successive design schemes in the historical and current collections, will rather continuously underline and

13   The second scheme followed the 'Leonard Lauder given conditions', named after the main sponsor of the project: to have a new building at the height of Breuer, next to the Breuer (in place of the brownstones), to have floor connections between the buildings, to retain the brownstones' facade. Therefore, the site diagram (discussed in Chapter One) was redefined, and indicated the portions proposed for demolition, stating that the new scheme would rely on the fact that although the Madison Avenue brownstones contribute to the historic fabric, 'alterations of these buildings can be proposed and they should be reviewed by the Landmarks Commission'.

embrace this difference, and measure it again and again in a continuous process of comparison.

The option process gradually led the architects to the production of an array of scale models illustrating the many changes to the building's profile – the concept, structure, circulation, site conditions. What one can see on the table of models is an assortment of models-in-progress, models that 'talk' differently about the building, models that act differently; they acquire more details, more layers, and more fields of action. Arranged next to each other on the office shelves, staged on the tables of models, distributed in the client's quarters, they present different claims about the building and define its repertoire of potential actions. As we will see, around this table numerous presentations are made and various protagonists meet and exchange concerns, opinions and estimates. The simultaneous production and display of models and options makes it possible for architects and visitors in the office to see, feel and experience the building.

Making the Models Talk

Even though the Koolhaas NEWhitney project (in contrast to the projects of Graves) was never made officially public, many external actors were involved and their active engagement drew degrees of public attention to the project. As seen in the historical interpretations of the Whitney building, many protagonists entered the story at different stages and their input, estimations or critiques influenced the process of the design. The making of the NEWhitney showed also that the dynamic process of reinterpreting the Whitney – through model- and option-making – happened with the active participation of engineers, stage designers, the client, artists and museum professionals. This process was continued in the numerous presentations of the project.

To make the various options and the two comparative design schemes visible and their differences perceptible and understandable for the client and proto-users, architects from OMA spent a huge amount of time planning

and designing different presentations of the Whitney project, employing a variety of strategies to present the building in such a way that the client could *see* its complexity, demonstrating how the client's requirements are being taken into account; and striving to persuade proto-users of the proposed design's perfection. I never attended a meeting with the Whitney client in 2002; representatives of the Whitney visited the office in Rotterdam only a couple of times, and the meetings in New York were not public. While Rem and Carol were attending these meetings, the rest of the team stayed in Rotterdam, impatiently awaiting news from Carol about 'how the meeting went' and 'how the client reacted'. Thus, I learned about these meetings only through the periods of anxious preparation of the materials and the presentational strategy, when architects could only anticipate potential reactions, and in the time after the meetings, when architects, either disappointed or satisfied, commented on these reactions. I only witnessed in-house presentations of the Whitney project to curators, artists and museum professionals, as well as some informal office tests and rehearsals.

A survey of the archives of the presentations of the not-yet-public NEWhitney design in the period from March 2001, when the project kicked off, until May 2002, when architects were engaged in an intensive stage of modifying the existing design and producing cost-saving options, shows that there were 24 presentations to Whitney museum fellows (curatorial meetings, programme meetings, meetings with the Whitney staff, meetings with the Artists Advisory Committee, meetings with the main sponsor Leonard Lauder, Trustee's presentation) and 12 presentations to city officials (Landmarks, Mayor and Deputy-Mayor, Board of Standards and Appeals). Thus, although the project was put on hold for three months due to Mayoral Elections (November 2001–February 2002), it travelled often and was presented to a variety of actors, all of whom made it talk, and had requirements and concerns that needed to be incorporated. As they did so new associations were traced among the actors.

Discussing the materials the team needed in order to present the Whitney at the Budget Presentation in May 2002, architects composed an inventory: 'beautiful small model(s) suggesting different possibilities; small selection of study models; circulation model, highlighting the technical zone and Breuer core; programme model: didactic model where given

conditions are 'glued' and can be moved; street collages; money; books? ...'[14] This is how the preparation for a meeting usually starts: a morning meet-up around the table of models, a discussion about the inventory, and then hectic preparation of models, days full of team meetings with or without the chief architect, nights busy with model-making, updating of drawings, collages and diagrams. Sometimes, Erez says, in these periods of intensive design and presentational work 'the building changes entirely ... the taxi is waiting and you pack everything and you realize it's a different building'.

Architects pay equal attention to the format of the public presentation: not only the timing of it, but also the location, physical décor, spatial setting and even the architecture of the room where the presentation will take place. To prepare a panel for the Landmarks Commission, Whitney architects need to know ahead of time what the size of the room is. They consider very precisely the design of the internal space: whether it is to be a round table presentation, which will allow them to show models of a particular size, or a podium presentation where the panels will be more visible. Discussing the preparation of the upcoming presentation to the Landmarks Commission Carol said:

> It's kind of a horrible room they have – a big table, and they have a speaker, it's like a little lab. So to make any kind of grand presentation is difficult, but we are still allowed to do that. So, we need to figure out the best way. We also have to know the timing – for instance, whether we are presenting first thing in the morning or first thing after lunch, so that we have time to set up. We will only have about three minutes to clear up, so the presentation has to be easily removable.[15]

The number of people attending the presentation, the scale of it, the time needed to set up and to clear up, the disposition of the actors and the entire physical spatial setting in which the building is presented – all these make a big difference to the understanding of the architectural project. In the preparation meetings the materials are discussed along with the presentation scenario, the elements of the building and its various meanings.

14   OMA Archives.
15   Interview with Carol, April 2002.

Thinking about the building and how to present it – with what kind of materials and what strategy – are inseparable parts of a rhetorical scenario intended to convince the client. Thus, designers are concerned with the very spatial architecture of the architectural discussion, with the details of the space in which space is tackled and commented on.

Besides the question of what to show and where to show it, designers also reflect on what exactly to present at every stage of the design venture. For instance, they do not show the bigger Whitney models to the client in the early stages of the design process if the concept is not yet defined enough; in these cases they prepare smaller models for the presentation, which are quite suggestive, so that the model cannot be extensively questioned by the viewers. If the purpose is 'just to create the impression that the building is feasible' the small models can achieve this better than the larger models. By meticulously watching over both the visuals and the particular arrangements that allow the visuals to 'speak' in presentations, architects become the designers both of the building and the appropriate contexts for its apprehension, of the architecture and the architectural conditions in which it can be understood.

Designers from OMA also engage in long discussions about the various strategies for presenting the building to clients and users:

> We need to show that there is a continuous exhibition space. I think *they read all these images as being like a box and a box and a box, with no connectivity.* So, part of it is just how to combine them ... This section is really very important. Max [the museum director] said that almost all we need to show is the exterior and the interior and then a plan and an image of the interior showing the connections. Willard [Willard Holmes] said they don't appreciate metaphors on the exterior of the building like the airplane. Maybe, we just have to get rid of that kind of things. Because basically our brief was that it shouldn't be higher than the Breuer, the floors should be continuous, and the airplane shouldn't be there.[16]

The building is to be shown in such a way that the important elements are *seen* and the crucial messages *understood* by the client. If the clients see 'a box next to a box', architects should explain to them how to connect these parts of the building in order to see how the building works.

16   Interview with Carol, September 2002.

Effective time management is often discussed in minute detail before a presentation and is considered to be an important factor in furthering the client's understanding of the building: 'a thirty-minute presentation is not enough for the client to understand how the new extension is going to be connected to the Breuer at every floor'. Afraid of overwhelming the client with the complexity of the Whitney project, architects carefully conceive a presentation that will help the client understand how the building works, and what the architects intend by designing it in that particular fashion. It remains impossible to visualize the building without anticipating the many possible ways the building can be seen and without figuring out the ways it can be understood.

Being constantly concerned with the client's responses to the building, architects engage in rethinking the visual strategies of making the OMA interpretation of Whitney comprehensible to the client. Presuming that it will be very difficult for the members of the Board of Trustees to understand how the scheme works, and to comprehend the logic of a museum with a vertical design, the Whitney team engaged in series of tiny corrections and visual 'make up' so as to improve the verbal capacities of models, diagrams and images. Architects did a lot of axonometric diagrams[17] to visualize the circulation in the building and to make understandable the programmatic arrangements of the spaces.

> We are doing it *by arrows*, but of course we are testing different ways of doing this. The main thing is that it has to be very simple; as it is, the plans, the sections, and the drawings have their own levels of complexity. It's always important *to be very clear*. Otherwise *the client will get lost in the things we are doing and what we mean*. Arrows, probably arrows, but right now I wouldn't say only arrows. We have also discussed other arrangements, such as having it laid flat on a sheet with overlays. So, we will probably print the levels onto a transparency and then overlay them, adding layer after layer until we can say 'ok, the next layer is.'[18]

How are the different layers of the building presented?

17   The axonometric diagram shows the building as viewed from a skewed direction in order to reveal more than one side in the same image. In the axonometric representation one axis of the building is typically shown as the vertical.

18   Interview with Kunlé, September 2002.

Figure 16: Presentation of the Whitney project (photograph by the author)

As one can see from Kunlé's explanation, the setting with models, collages and visual panels, imply particular rituals of presentation and perception (as seen in Figure 16). It relies on the clarity of the visuals, and a variety of ways of presenting them: from simple arrows through to arrangements involving layers which represent the building's complexity. I will call it 'speech-generating scenery' that engages architects to work actively to stage a setting that will allow the visuals to act in an *illocutionary way*: to spell out the building's concept and articulate its repertoire of actions.[19] Designers think simultaneously about the way the visual media are done, the format of the presentations that these media make possible and the specific concept of the building they communicate.

19   Here I refer to the term of Austin, 1975.

Working hard as they do to improve the readability of the building through models and other visuals, architects expect the client to gain a better understanding of the design.

> I would say that in certain cases there are clients that are able to understand. Sometimes it is not so much a question of ability, but something more complicated – a question *of willingness, and of fear and courage to take such a step.* I do believe that among our clients there is a number of people who understand quite well what we are trying to do, but who unfortunately do not dare to take something on ... We work a lot on improving understanding, and our way of communicating is one that is very much related *to simplicity and series of simple arguments to construct eventually a very complex whole.* At the same time, there is a lot in this whole that no longer meets any explanation.[20]

The panels are meticulously prepared so as to enable the client not only to *understand*, but also to entice him to work for the realization of the building's concept. In a situation of limited time and space, the particular arrangement of compelling visuals with a strong *illocutionary* force should allow the client to 'see' the building. Within a very short space of time, the client has to be able to go through a variety of issues of concept, circulation, structure, and cost estimation. Thus, to 'understand a building' means to immerse oneself in a setting that embraces a variety of representational states of the building – a 'speech-making scenery' that relies on the *illocutionary power* of models and visuals, and which will demonstrate again the capacity of the building to do things: generate effects and trigger thoughts and reactions (its *perlocutionary force*). Through inspection of and interaction with this setting, clients and proto-users should be able to hear a meaningful speech while observing an assortment of visuals.

Deploying different presentational approaches, architects develop a variety of strategies for convincing the clients. One of them is to show 'that something similar has been done before' and that the particular design proposed is not anything new or vague. Thus, a variety of well-chosen precedents is enlisted and discussed together with a stage designer from France, who was invited to consult the Whitney team on the feasibility of

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20   Interview with Ole, September 2002.

scheme B, and more precisely the movable stage. A few examples of realized buildings with a similar stage system are given: the Congress Center of France, Opéra Bastille, the Opera in Genova. Designers from OMA need exact prices and images to show the client that what they propose is doable and realistic. Or, as Erez argued in a team discussion with the stage designer: 'It's good to have these images, because we need to show that it's not just something in our heads'. The different examples prove the feasibility of scheme B's movable floor, and the various consultants mobilized in the design process offer incentives for a better presentation of the building concept. They improve the quality of the 'speech-generating scenery', taking into account the client's background and expectations, and making it a powerful instrument for convincing the client.

Another important strategy is to make the model and its surroundings 'look real' to the client and proto-users. Following Sarah, Erez and Shiro in their preparations for a series of upcoming presentations of the Whitney project in New York in April (a meeting with the mayor and meeting with artists and curators from New York City), I witnessed many of the operations needed to make a model look real. In order to replicate the interior of an exhibition hall, architects painstakingly cut out images representing a random selection of the permanent Whitney collection and stuck them on the internal walls of a large-scale model:

> The pictures have been selected already, I have just to put them on the walls. We choose how to display them in the museum hall. I hope the curators are not going to laugh at this. [She is pointing to the model.] *For us it is the real building, but we know that these models are not real buildings for the curators and the client*; that's where their laughter could come from. The stagier informed me that he tries to imagine certain practices in the different parts of the building and puts in the figures according to that, so it's not an absolutely random arrangement of the fictive public.[21]

21   Interview with Sarah, April 2002.
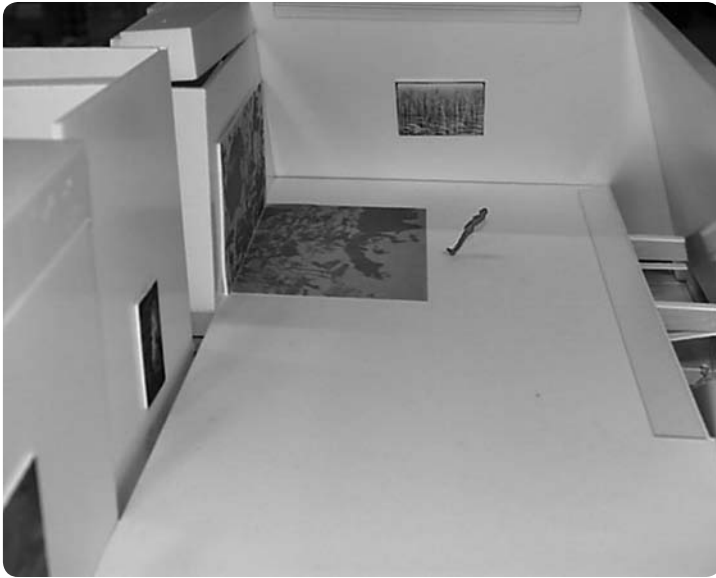
Figure 17: Interior of the exhibition hall in the NEWhitney model (© OMA)

More figures are added to the model, as seen in Figure 17, to represent the 'fictive public', and show different characters. 'It's like the cartoons, you see the Japanese guy with the camera,' says Erez. In addition, in order to avoid a random arrangement, the figures are placed in the model according to specific practices that would correspond to the types of programme envisaged in the different parts of building. Architects also discuss various tricks to make the space look bigger: to present a corner without internal walls instead of series of walls, for instance, so that the space looks larger. Then, pictures of the internal display in the model are taken and placed in Photoshop so that Erez can manipulate and improve their quality by correcting the little imperfections. After spending hours disguising the foam traces left on the images, he then proceeds to introduce the city into the model: 'I'm going to put an image behind the windows, a view of the city to make it look real.' Thus, by having pictures *like* those in the Whitney

museum, making the windows look out onto the city *like* in New York City, and 'hiding the blue foam traces to make the model pictures on the screen more real', models can achieve a degree of reality in the eyes of potential viewers that will be closer to the degree of reality they hold for the architects, for whom models remain 'the real buildings'.

As they work on the preparation of models and images for presentations, on the choice of materials and the presentational format, architects are continually trying to anticipate what the clients and proto-users will say, and how exactly they will react to particular proposals and suggestions. 'I hope the curators are not going to laugh at this', said Sarah while placing some 'Whitney paintings' in the model of the exhibition hall. Architects also expect that during the presentations the Whitney Trustees will express other wishes ('Can I have a gallery here?') and raise new questions that may alter certain elements of the existing design and may even redirect the course of the design process. Therefore, preparation also consists of guessing the possible reactions that the models and the entire visual scenery will generate. In this way, the client is continuously present in design discussions as an invisible imaginary figure to whom models and visuals are supposed to talk. In order to prepare the presentations, the Whitney team also needs to have more interim reactions from the client at different stages of the project's development instead of waiting for the big meetings with the Trustees in New York where important decisions are taken. The clients' visits are important for giving direction to the design: 'they have been here, and they said, yes, yes, yes, and go ahead, and we did it'. Architects also regularly send the different plans, models and drawings to the Whitney Board (and to its director) and expect feedback in return. Sometimes, during the work on the Whitney project, input was given via an exchange of letters, e-mails, and briefs, sometimes it reached the Whitney team via informal communications with Carol or Rem, and sometimes it never arrived at all. Reacting to the second scheme in September 2002, the museum's director, Max Anderson, wrote to the architects from OMA: *'Please tell Rem and the team that I'm very pleased with the direction. The current scheme has excitement and magic while answering the siren's call for*

pragmatism.[22] This little message provoked excitement in the office and inspired the team enormously at a time when, following a very exhaustive option-making process, they had little motivation to deal with any eventual further changes.

Presenting the Building

Designers from OMA usually put on display in the middle of the office a fanciful variety of models; they thus expose the sheer density of the building's requirements. Each Whitney model takes into account in its construction the adjacent buildings, the tiny slot allocated to the site, the eclectic features of the New York City fabric, the zoning fragmentation, the museum's philosophy, the marks of history, and city politics. It welds together heterogeneous parameters and concerns in a coherent composition.[23] The models are arranged on the office tables in such a way as to make them 'talk together' about the building. The structural model of the Whitney, for example, *talks* about a particular method of stressing the upper middle part of the building so as to make it hold the upper bulk on a tiny footprint and make it stand independently. It tackles the challenge of establishing the stability and autonomy of the new tower in the NEWhitney complex. Illustrating an agglomeration of concerns of stiffness and robustness, the model reflects the laborious work of numerous structural engineers from Ove Arup; it goes as far as problematizing the height of the concrete structure, and even the changing prices of the concrete. To take another example, the circulation model *talks* about the

22   E-mail to Carol of 6 September 2002.
23   These elements and experiences, when transplanted into the model, point to the moment of 'coming together into a new whole', and show how well the model is able to 'accommodate an almost random number of things'. On the composite character of models see Yaneva, 2006.

NEWhitney in a different way by tackling the distribution of the floor space in the three portions of the building, the disposition of the escalators, the way visitors get into the building and the way they move around it. In sum, the model argues for an articulated mechanism of circulation in the complex ensemble of three buildings. This model demonstrates different circulation paths to and through the space, showing 'where' the visitors are allowed to move and how exactly they are meant to traverse the buildings.

Placed as 'neighbours' on the table of models, the structural, circulation and conceptual models form an adjacent relationship, and architects rely on this in the design process and in presentations. Although related, they are not deducible from each other – the zoning model cannot be anticipated or conceived from the circulation model, the circulation model cannot be derived from the structural model. Having external and accidental connections only, they remain logically ignorant – they stand for themselves. There is no way to get out of the structural model without getting into the site model or the circulation model; the structural model prolongs and completes the site model, the circulation model extends the programmatic one. That is why *all* models sharing the table of models are continuous: one leads to the other, borders it, prolongs it and passes to it without requiring an interrelation. Being mutually adjacent, or contiguous, they form a collection of visuals that are meant to generate arguments about the Whitney building in public presentations.

On the table of models no model is the 'original' prototype of the building – models find themselves in a relationship of 'nextness' rather than in a linear, temporal sequence. There are no predecessors or successors, only neighbours; they are not dependent on each other, but they must be *associated* in order to exist. The tie that binds them is that of a common time and space; their form is a collection, an additive entity, rather than a system. In other words, they offer a plurality, 'a large range of starting points of view', which reveals the building through a cumulative process of adjoining, setting and re-adjusting, staging and re-staging, displacing, bringing together and accumulating models and other visuals. 'It's *more user-friendly to have different models for different points* that we want to show,' argues Sarah, and

she goes on: 'As the building is complex we need to show several models at the same time in order to make the clients understand.'[24]

What architects do in a presentation is *add*: the circulation model is added to the structural model, which sits on the table along with many other models, samples and options (Figure 16). It is placed adjacent to other visuals in order to increase, complete or improve the assembly in such a way that the building refers to all of them. Each of these models says more in connection with the others than it would in isolation. Disparate things are added together or collected in such a way that it becomes difficult to count the number of things that have to be physically assembled in order for the building to emerge and be enabled to talk to architects and clients. To show the building over and over again, designers have to *re-collect* it – to displace several models from the working table to the presentation table and back again, from New York to Rotterdam. In displaying, reassembling and re-adjusting these models and visuals the building appears afresh.

The fact that two different collections of models present the building in two separate parts of the world shows that no logical dependences, inner fitness or coercive sequence can 'glue together' the models from the two collections. One assortment of Whitney models remains displayed on the working tables at the OMA in Rotterdam. Another travels frequently to New York to meet the clients and to convince them that the building would actually stand up or that it will please both artists and curators. In what follows, I will let the reader witness what happens around these collections of models: *what models do*, how the viewers react to them in New York and in Rotterdam, and how they learn about the Whitney project from the models.

24   Interview with Sarah, February 2002.

Rotterdam, February 2002: curators and artists meet the NEWhitney

Curators and artists visit the office to see the NEWhitney project (as seen in Figure 16). Passing from one table to another, they discuss a variety of topics, such as recent extension projects, different museum philosophies, and some ongoing museum projects of OMA: the Hermitage in Las Vegas, the LACMA project, etc. Pausing at the Whitney table of models, Rem commences with the words: 'I am very curious to see what you think about the notion of museum. We are going to work on it now'. Arguing that the museum space cannot be conceived without the curators and that its design should be the result of a collective decision, Rem actively questions the participants in the meeting, cautiously watches their reactions, and seeks particular feedback on thorny topics. He presents the NEWhitney project by going through the collection of models, panels, and presentational books on the table. Passing from one model to another, from a diagram to a large scale picture, the chief architect *adds up* different explanations as to why certain things were done in certain ways: 'the brownstones are listed and cannot be removed' (pointing to the site diagram); 'the transparent cover on the model is the New York Zoning' (touching the zoning envelope model); 'in the brownstones the paintings are exposed on a domestic scale' (pointing to huge panels on the wall displaying the domestic conditions of the brownstones); 'the elevator goes in this space and you see people going up, but nobody coming down' (taking the circulation model in his hands and showing it to the others in close up); 'the building is constructed around this up and down movement of elevators' (pointing to the circulation diagram). This is how the NEWhitney is presented and becomes visible and comprehensible for curators and museum professionals; it gains more layers as the chief architect adds more and more strands of interpretation as possible starting points to the Whitney design. Tackling a variety of heterogeneous issues – the issues of renovation and museum extension, the development of modern art, the rising price of concrete, the circulation principles in the architecture of Le Corbusier, and the very notion of what a museum means today – alongside the building concept, the Whitney is conjured through the many connections between the visuals displayed on the table and on the walls. Responding to the models and other visuals, the curators and artists

express judgments and estimates, and share fears and concerns. They discuss different types of visitor experience as well as mechanisms for constructing museum narratives in these spaces. The artists comment on the building's potential to act and generate artistic effects for particular exhibitions, while various ways of modifying the interior of the exhibition rooms with architectural tools are tackled. Specific suggestions are taken into account by the chief architect and later incorporated in the design process.

New York, April 2002: the mayor meets the NEWhitney

Back from the meeting on 15 April with Michael Bloomberg in New York, Carol informed me that the meeting went 'incredibly well':

> CAROL: 'The mayor was mostly concerned with whether the NEWhitney is going to get the money to be built, because there is no city money right now in New York because of the financial situation … and he said "OK, I can't give you the city money, *but I can take the heat.*" So when it becomes public, because no matter what we do there will be controversies, it may be just the neighbours complaining about losing their view, etc. And so he said, "There is democracy here, of course there will be a lot of controversies, *they are right to express their views, but I can take that heat*. New York needs this, and this is a museum for American art." …'
>
> ME: 'And he didn't have any questions about the design?'
>
> CAROL: 'Not really. I think *he understood it*, and the presentation was very quick. We had some 45 minutes scheduled with him, but we really met for only 30 minutes. So, he spent 10 minutes talking about the Whitney's need to extend, the history of them trying to extend, the economic need to the city, and what art does for the city. And then he said 'What does it look like?', so Rem gave a presentation that was also 10 minutes long.'
>
> ME: 'With slides, or?'
>
> CAROL: 'No, we had a small model that Rem used didactically, and he showed the footprints, and the shape and the zoning envelope, and there is a new model that we had made that was with the zoning box, which he could pull away to show what is going to happen. So, he used that, and then we had one view of the city, and a panel, just a reduced version of the city. A panel, I don't know probably, like 2 or 3 feet. We showed one of the Graves' building and we said, "see what they tried to do" (ha-ha-ha) and then we did a programmatic description of our scheme, the display of art, and how we understand the shape programmatically,

and where the entries are and how we are still using the Breuer building, and the
relationship between the Breuer building and the brownstones.'
ME: 'And he ended up calling the design "brilliant" after the presentation?'
CAROL [very happy]: 'Yes, right!'[25]

Designers from the Whitney team prepared mainly images for the
meeting with the mayor, including some pictures presenting the internal
display, and others showing the relation to the city and the site and how the
NEWhitney shape was generated: 'a section to explain where all the differ-
ent programmes happen'; 'a diagram to show how people move through
the building'; and 'the structural diagram to explain the skin, and the way
the skin was created'. In addition, images illustrating Graves' design solu-
tions, and diagrams demonstrating the smallness of the actual Whitney in a
comparative perspective, and showing its relationship to other museums in
New York, were generated and added to the presentational materials Carol
took with her to the meeting. In the presentation to the mayor, a variety
of starting points are again presented in such a way that the main aspects
of the complex NEWhitney are recalled in a concise manner, and in a very
short time. Architects again mobilized the whole assortment of visuals
to create a 'speech-generating scenery' that allowed viewers to seize the
building quickly and understand it. In this setting, again, models, images,
architects and the mayor exchange arguments and talk to each other.[26]
    In these two presentations the Whitney was staged on a table as
an assembly of a few models and visual panels, tentatively adjusted and
arranged; each of them presents the museum building, each of them con-
tains it, and only through their collection can the building extension exist.
It does not emerge through anticipation or mirror projection, nor does it

25   Interview with Carol, 22 April 2002. After this successful meeting in April, the
     anticipated schedule for the project was to present the building to the Landmarks
     Commission in May, to make it public two weeks before the Landmarks, so that
     there would not be enough time to build opposition against the project and to
     start a schematic design on 1 June (to determine the structure and to specify the
     materials).
26   In engineering design models also serve as tools of communication in presentations,
     as a 'social glue' among engineers, clients and users (see Henderson, 1999).

exist outside its models and visuals; rather it is conterminous with them.[27] The building manifests its multi-faceted specificity both in design and in presentation. It emerges both on the tables of models in the studio and in public presentations, and gains a reality only through *all* the visuals that are arranged in the 'speech-generating scenery'. In order to recall the building architects pass from one model to another, from one representational state of the building to the other; that is, *they add* more and more visuals, further layers and fields of action in order to make the building visible, able to talk and to act. In the process of producing-and-selecting options and in the situations of presenting, recollecting and re-enacting the building in the eyes of its first public, the building gets knowable, real. When evaluating the first reactions to design, incorporating them and improving the building, architects also test its capacity to act socially and to enrol supporters or critics.

27   On the building as deriving from a collection of models that are additive, from a 'multiverse', see Yaneva, 2005a. On design objects as assemblages, see Law's study on aircraft design (see Law, 2002).

Towards a Pragmatist Approach to Architecture

Although a building has its own strengths and inner logics, it is usually assumed to reflect the specificities of a style. Its design is often understood as mirroring the shifts in politics. While architectural projects develop according to their own inner drives and competitive logic in order to be better comprehended they are commonly associated with the social contexts of their creation, the cultural and the political climate, the specific institutional developments. In spite of the fact that architects painstakingly struggle to answer client's briefs and communities' concerns by a set of distinctive design moves, their designs are often said to pertain to differences in their individual creative approaches, backgrounds, styles and visual languages. Even if the design process of extending the Whitney museum unfolded according to its proper logic, as seen here, architectural critics still try to explain the reasons for dismissing the Whitney addition projects by referring to the chronic identity crisis of this cultural institution or engage in causal explanations of the museum's history (Weinberg, 1997). Aloof from any interpretative functionalistic frameworks, requirements of the context, or any type of cultural references of humanistic nature the design of a building was analyzed in this book as an entity in becoming whose design process could not be apprehended by factors *outside* architecture in addition to its inner logic.

One way to understand buildings would be to envelop design processes, architectural objects and artefacts in as much frameworks and context(s) as possible. To explain a building would mean to return to the ambition of mainstream social science – and namely to produce a 'social explanation of' architectural projects, buildings, city dynamics, urban networks, design controversies, and by so doing to sociologize every object and phenomenon that can be named 'architectural' or 'urban', thus ignoring or destroying their specificity. Such an approach inspired by the critical theory will inevitably

suffer from one main deficiency: it will not be empirical enough, as empiricism is considered a blatant attempt of trivializing architectural practice. That is, a very narrow definition of empiricism that relies on the division of natural and social, of architecture and society. The programme suggested here is rather inspired by William James's project of radical empiricism that implies a different sense of the word 'empiricism'. Empirical would mean to be faithful to what is given to experience and the numerous connections that are revealed in it. Following what is given to the experience of designing architects at OMA, the particular Whitney case provided a situation to tackle the pragmatics of design.

Here, a 'pragmatist approach' to architecture rather than a 'critical' one has been advocated.[1] Pursuing such an approach permits to witness and describe the modes of existence of various architectural objects and account for numerous architectural connections that flow out of the streams of experience. By so doing architectural theory would focus its efforts on accounting and understanding, not replacing, the objects of architecture and built environment, its institutions and different cultures. That is, a methodological ambition inspired by STS.[2] Drawing on such a pragmatist approach, architectural theory should strive to understand the *architectural specificity* of architectural objects and networks, instead of trying to provide by all means, a stand-in (social, psychological, historical or other) explanation of architecture, city and urban life, i.e. a psychological explanation of the creative energies of the inventor-architect, a psychoanalytical

1   Architectural theory successfully borrows concepts from the critical sociology of Pierre Bourdieu and the two other contemporary critical projects of the philosophers Jacques Derrida, recognized as deconstructivist, and the archaeology of Michel Foucault. Known as critical social theory, these projects assume that the main operation of science consists in *revealing* hidden mechanisms, constraints or representations, and these revelations have an important political dimension. Only recently design theory began to tackle the 'pragmatist imagination', and attempted to define 'alternative ways of design thinking' (see Fisher, 2000; Ockman et al., 2000).

2   Although the project of pragmatist sociology was constituted on the basis of the numerous studies of a specific object – science and technology – and defined progressively itself in contrast with the 'classical' approaches of sociology of science, architectural studies could follow it with a great deal of success.

explanation of the relationship client-architect-user, a historical or economic explanation of the social context(s) of buildings. Another way of approaching cities, urban networks and architectural design will be to state that: there are no 'social dimensions or factors' of any sort explaining the success and failure of architectural projects or urban manifestos; no 'social influences' that would condition the emergence of an architectural style or would explain design failure; architects are not simply 'mere informants' embedded in a 'social context'.

Such an approach to architecture consists in investigating the architectural culture and the practices of designers rather than their theories and their ideologies (Callon, 1996, Yaneva, 2005, Houdart, 2006). It follows what architects, urban planners, developers, designers, engineers, and clients do in their daily routine actions, in spite of their interests and theories, thus constantly prioritizing the pragmatic content of actions, not of discourses, in the light of a distinction between 'architecture *in the making*' versus 'architecture *made*'.[3] Architects are to be studied not because they are important with their theories and values and not in opposition with architecture, but because they make possible the existence of numerous institutions, buildings and artefacts, instruments and theories that constitute architecture and the built environment. Yet, such an approach does not consist in the simple description of architectural practices or discussions and analyses of relevant architectural and urban theories. It rather aims at making explicit the performative or pragmatic dimension that connects architects to buildings and at accounting their shifting associations.

Overlooking society as a sufficient source of explanation of the architectural and the urban, the pragmatist approach does not limit itself to the study of the social connections, factors, relations, and identities that shape and are shaped by architecture. It argues against the traditional view that buildings, architectural institutions, products, and ties are due to the diffracted presence of Society above the built environment. It rather explores

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3   Following the well-known distinction between 'science in action' versus 'cold science' (see Latour, 1987), or 'finished' versus 'unfinished' science (see Shaffer and Shapin, 1985).

the 'architectural associations'. Or, as Latour has put it: 'we should shift from the study of "social" factors to the study of "associations".'[4] Buildings are not projections or representations of the social. They *are* social (as seen in this book) because they possess an immense capacity of connecting heterogeneous actors: in the design controversies many important associations and ties are traced architecturally; new associations are shaped in the process of circulating plans, cutting and scaling models, and presenting them to the public.

The Whitney controversies enrolled a large number of heterogeneous actors and re-connected them differently through its trajectory: community groups, gravitation laws, clients, historical buildings, architects, zoning requirements, street walls, museum philosophy, preservationists, and neighbours. More recently the design schemes of the NEWhitney enrolled also a variety of actors: value and mechanical engineers, foam models, stage designers, the mayor of New York, program diagrams, museum professionals, and architects. The bigger the number of actors and resources mobilized around the Whitney extension plans got and the associations among them increased, the more social design became. New associations were traced between the three architects that contributed to the Whitney career and revised and redrew the plans and sketches of the same building in a different time-space; without having to re-open the same controversial design object, they would have never 'met'. This particular capacity of a building to *associate* both human and non-human actors, and in different periods of time, makes it an important social actor.

Following meticulously the sort of objectivity architecture provides between scattered elements like design thinking, historical enquiries, results from experiments with materials and shapes, measurements with physical models, presentations for clients and users, protests to design, I argue that a building cannot be defined by what it is and what it means (Jencks and

4   According to Latour 'society has to be composed, made up, constructed, established, maintained, and assembled. It is no longer to be taken as the hidden source of causality which could be mobilized so as to account for the existence and stability of some other action or behaviour' (see Latour, 1990, p. 113).

Baird, 1969; Bonta, 1979; Goodman, 1988; Venturi and Brown, 2004), but only by *what it does*: what kind of disputes *it provokes* and *how it resists* to attempts of transformation in different periods of time and according to the variable geometry of different human and non-human actors. Only by enlisting these trials, and accounting carefully its pitfalls and tribulations, would one be able to state a building's existence; its existence would equal to the extensive list of controversies and its design performances over time. A building exists if it acts, resists, affords, compels, challenges, mobilizes, bugs, and gathers different communities of actors, and not because it is being narrated and re-interpreted – discursively made anew, as argued by constructivist studies (Gieyrin, 2002). It manifests its agency in design; far from shaping social identities and relationships (Galison and Thompson, 1999), *it simply connects architecturally*. A building appears as being the unexpected and improbable result of a slow process of hesitant and non-linear historical comparisons and interpretations of what a building does, of daring and sometimes arbitrary design experimentations and trials, and many different actors contribute to it as the architect's initial choices are subjected to modifications due to a variety of constraints. That is how design can attain unpredictable, and sometimes, accidental results. It often requires negotiations among all the participants in the design that play a part in this complex and long-lasting process (designing architects negotiate with the design history at hand, with the value and structural engineers, with scale models and foam materials, with the representatives of the client and the proto-users).[5] Design has a proactive power to incite public controversies over thorny issues and generate social effects.

A building exists not because its builders have laid down the foundations of a construction that grew up and stood firmly, but because many architects, neighbours, community groups, client and proto-users have been incited to act according to it, and have reappraised it many times. That is, a building exists, not because it happens to be materialized and con-

5 Works on sociology of conception have shown that conception, design, and creation are negotiated, negotiation and compromise being key terms in sociology of science and technology (see Callon and Latour, 1991).

structed, but because of the turmoil it triggers; not because a lot has been done to make it happen, but because it can *do* a lot. And since a building does not equal a number of structural and programmatic features or symbolic meanings, to understand the Whitney architecture it is not enough to question its inherent properties, the specific figurative languages of its architects, or the social contexts of its design plans. One should consider *the whole process of transformations* of the building in design. As a result the Whitney building is defined by particular *abilities to act*, and *performances* demonstrated in design. Only such an understanding of buildings can bring more awareness of the ways architectural design is made and how it participates in the shaping of the social, of the associations established between buildings and their publics.

The Whitney case inspires also a different understanding of the various undertones of the meaning of 'design', and more specifically of architectural design. To design (a building) does not mean to go forward and break radically with the architectural tradition; it is not an expression of the search for absolute certainty, for radical departure from the past. As seen in this book, there is nothing genuinely foundational in design; it shows no need for the creative process to be entirely revolutionized, no absolute mastery over the materials, no precise prediction of experiments, no grand gesture of radical departure from the past. In fact, design relies on a cognitive and experimental move of going back, rethinking carefully and re-collecting, re-inventing, re-interpreting, re-looking, re-doing everything once again in a new combination of conservation and innovation; it means to *re-design*.

Rather than breaking the rules, inventing new fashions from scratch, designing a building means that one never starts from a *tabula rasa*: designers re-assemble existing bids in a new combination of old and new, test them and put them together, re-interpret existing historical meanings, redefine site conditions, scale down budgets, re-assess material constraints. Numerous given conditions, museum identity concerns, previous design proposals, community protests, constraints of a growing collection all exist first in a design project and are to be rethought, reshuffled and transformed into something bigger, updated, more lively, more commercial,

more acceptable – an addition. In other words, there is always something counteractive in design.

The design of a building is often analyzed in terms of symbolic meaning. In architectural theory, design easily lends itself to semiotics: it is made to be interpreted in terms of language of signs. Yet, the Whitney case demonstrates the irrelevance of modernist opposition between what is social, symbolic, subjective, lived, and what is material, real, objective and factual. It shows that there are no distinctive ways of grasping an architectural object, i.e. one through its intrinsic materiality, the other through its more aesthetic or 'symbolic' aspects. To design is not simply to add meaning to a brute, passive, and technical matter. The materiality of every scenario for the Whitney extension, of every distinctive design scheme, of every programmatic or structural model, of every single cost reducing option, spreads a meaning with it, and changes the interpretation of the initial Whitney.

Design also requires a meticulous attention to details: to the specific features of the carrier of the object designed, to the minute movements of the foam and the angle of the cutter, to the reactions of users at presentations, to the tiny derivations from the initial scenario, to the options, to the series of dismissed projects. Designing a building requires much more skilfulness, craftsmanship and obsessive attention to the minutiae instead of relying on the flight of subjective imagination and the grand gestures of emancipated creativity. A building is not obtained in an astute double-click moment of invention, but through numerous little operations of visualization, scaling, adjustment of instruments, options' production and selection, office presentations, historical comparisons and interpretations. This explains the immense abyss that exists between creating and designing; what is suggested by the old notion of invention as construction after destruction, as radical overtake, is the exact antidote of design. Architects as designers are far from being creators; working with precaution, crafts, meanings, and careful conservation they recollect the social trajectory of a building, re-enact design moves, produce and circulate visuals, present and discuss them with a variety of proto-publics, i.e. they are the re-designers of something that is already there.

A building is less an artefact, a construction, its design is less conceivable as modernist object; it is more conceivable as a 'thing', to use Bruno Latour's language, that is, a contested assemblage. The best illustration of the 'thing' character of a building is the Whitney – a complex assembly of contradictory issues – the brownstones destructibility, the zoning filling, the neighbours' vulnerability, the narrowness of the site, the museum professionals' fears, the perennial Breuer building inextendability. Made in a situationist, pluralist, and associationist fashion, the account of the Whitney design presented here has chosen to seize the erratic behaviour of the foam matter in the model–making venture in the office of Koolhaas instead of analyzing the impact of Surrealism on his thinking, followed the painstaking ways various publics were enrolled to evaluate extension plans and the various interpretations of the building trajectory in a comparative historical enquiry, instead of swiftly evoking the social and cultural influences upon architects, developers, clients and publics. A new task for architectural theory is to be put on the fore: following the particular associations, ways and actions, individual moves and collective groupings, through which architects, engineers, clients and users shape buildings, gain design knowledge and produce design objects, a richer repertoire of studies of buildings, architectural practices, institutions and architectural ties is to be generated. Only by producing such accounts that trace pluralities of concrete entities in the specific spaces and times of their co-existence, instead of referring to abstract theoretical frameworks outside architecture, will architectural theory contribute to the better understanding of architecture.

Epilogue

Little more than a year after Koolhaas's scheme B was declined, The Whitney Board has started the process again. The Italian architect Renzo Piano had been hired after a six-month search by the Whitney's architect selection committee to design the expansion. His plan was considered as far more modest in size and scale than the proposal of Koolhaas, defined as ambitious and expensive. One of the main requirements discussed in the press as soon as the Whitney Board announced the selection of the new Whitney architect, was to design an extension that will not compete with the Breuer building. Piano's initial design proposal figured a 178-foot-tall building that would rise behind the historic brownstones on Madison between 74th and 75th Streets and connect to the museum's original 1966 Marcel Breuer structure with a series of glass bridges. Preservation groups opposed fiercely the expansion plans with the angriest objections focusing on the move to demolish two brownstones next to the museum on the Upper East Side of Manhattan to make way for the new entrance. From the other side, a well-organized contingent of artists, architects and museum directors supported the expansion and countered the arguments of preservationists and neighbours. Piano's expansion plan aroused also considerable opposition among East Side neighbourhood residents, which escalated after the building expansion has been approved by the Landmarks Preservation Commission and by the Upper East Side Community Board in January 2006.

In July 2006 the Whitney Trustees began reconsidering their decision to proceed with the addition as they feared that this project might not get the museum sufficient additional space for the money. This was the third time that the Whitney museum has commissioned a celebrity architect (after Michael Graves and Rem Koolhaas) to design a major expansion to its landmark building, and his design plans were highly controversial, and subsequently dismissed. Meanwhile the Museum started to discuss the possibility of opening a more modest satellite in a downtown location –

a site in the Meatpacking District at the foot of the High Line – where the Whitney could have larger-scale exhibition spaces than a Madison Avenue addition. In May 2008, the Whitney Museum released detailed plans to add a second Whitney Museum site to the cultural and civic landscape of New York City with the construction of a new, six-floor, building in the Meatpacking District.

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Index