

NARRATING ARCHITECTURE

A RETROSPECTIVE ANTHOLOGY | JAMES MADGE + ANDREW PECKHAM

Narrating Architecture

The Journal of Architecture is jointly published by The Royal Institute of British Architects (RIBA) and Routledge. An international journal committed to advancing architectural discourse in its widest sense, its aim is to seek diverse views of the past, present and future practice of architecture, and to attract a wide variety of perspectives from the architectural and related professions, as well as from academics.

This anthology brings together in one volume a selection of papers that stand out after ten years of publication. The editors give readers access to international contributions in a carefully structured book, bringing coherence to a wide range of topics. The book is divided into seven parts: Architects and the practice of design; Architecture and the discourses of science; Issues of materiality; Narratives of domesticity; Problems of building; The sociology of architectural practice; Identity and the appropriation of place. It offers those teaching or running seminars in this subject area a readily available collection of recent research in several key areas.

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Narrating Architecture

A retrospective anthology

Edited by
James Madge and Andrew Peckham

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Introduction

This book is a collection of material which has appeared in volumes one to nine of *The Journal of Architecture*. It celebrates the first ten years, during which this publication has provided a platform for original investigations in the field of architecture both within the UK and internationally. In placing this material under the generic title of 'narrative', we intend to locate it within a conceptual frame which has persisted, in a variety of guises, throughout the second half of the twentieth century, and in narrating, specifically, architecture, we attribute to this particular narrative a characteristically spatial implication.

With every new twist and turn in the development of architectural, and more generally, cultural theory during the later twentieth century, one may detect an impulse to displace or, at least, to suspend narrative as the dominant mode. That is to set in its place conceptual structures, either more normative, or more critically provisional. There are those, for instance, who would see in architecture primarily the tangible necessity of an abstract and transcendental intuition; and those, on the contrary, for whom architecture and its narrative are merely a mask to be stripped away in order to reveal a disguised material reality (not to mention those for whom the manipulated surface, the appearance of the profession at its 'face value'; is epitomised in architectural journalism). Though these amending voices have not necessarily enriched it, they have unquestionably complicated

the plot: in any case, their cumulative effect has been, precisely, to constitute discourse as narrative.

Writers of architecture, then, tell (to themselves, to each other and to the world) stories of what architecture does: in which architecture, however defined, is the leading protagonist. These stories, whether enshrining compositional or operative principles or revealing experiential or ethical sensibilities, develop as spatial narrative, a characteristic mode of thought in both 'familiar' and self-consciously 'avant-garde' architectural practice and experience. Taken in this context, the variety of perspectives adopted by contributors to *The Journal of Architecture*, reflect an editorial openness that provides an unbiased outlet for critical investigation of the subject. Without declaiming any particular slant, *The Journal* has accepted the narrative variety of architectural discourse, not explicitly promoting the more arcane manifestations of contemporary theory but restricting itself to the task of narrating architecture.

All the work which is collected in this volume, like much of the work which has appeared in *The Journal of Architecture* during its first ten years of publication (whether or not produced within an institutional academic framework), may legitimately be described as research within the field of architecture. The issue of research within the field of architecture has been, increasingly, a matter of deep anxiety in the world of architectural education. Schools of architecture see their future threat-

ened by institutional prejudice as to what, in terms of their own discipline, academic research ought or, indeed, is able to be. Technical building research, carried out generally by non-architects, has tended to concentrate on the evaluation of available products and procedures in the light of, or as a basis for, building legislation. As such, it falls short of the criteria for pure science, out of key with the intellectual ethos of academic life. Research in architectural history or theory is an activity typically pursued by (and vigorously defended by) academics whose formation has been in History or Art History and who, for the same reason, can, on occasion, have an ambivalent role within schools of architecture. While the issues explored in Cultural Studies are widely perceived as relevant in the specific field of architecture, it is by no means clear how such relevance is to yield a form of research which architects would be particularly fitted to carry out. Neither, in the fields of management and law, crucially though these may impinge upon architectural practice, is there an academic expertise specific to architects or one generally cultivated in departments of architecture, which is likely to develop these fields of study substantially in academic terms.

What, then, is the nature or the source of this 'research' which we confidently claim to have discovered in the first nine volumes of *The Journal of Architecture*? To be sure, it touches in various ways on building science, history, cultural studies, law, management, as well as numerous other related disciplines, but its centre of gravity lies elsewhere. If the term 'discourse' may have been overworked and over-loaded with pejorative overtones,

it need signify no more than collective intellectual endeavour, shared in a specific field of activity. One characterised by salient questions, dilemmas in need of resolution, circumstances calling for the reappraisal of previous assumptions, or emergent data to be absorbed into an operative body of knowledge. Architectural discourse exhibits all of these features, along, no doubt, with many others common to groups whose economic interest is closely bound up with the maintenance of public credibility. Only a small part of any discourse falls under the proper description of research: small, that is, in relation to the persistent background noise with which the self-image of a profession is fabricated, nurtured, fetishised and propagated in each new generation. Research might be characterised as a part of that which remains of a discourse after all the gossip, narcissism, attention seeking and striking of postures have been boiled away (implicated though it may well be in all or any of these activities).

Research in science (or any other academically 'respectable' field of research) is, first and foremost, for the benefit of those who are regularly engaged in it. The supposed benefit to society at large is a happy, though not a necessary, outcome. So the research which is produced within architectural discourse be primarily of value to those whose regular concerns are architectural. Society will, no doubt, benefit in the long run if the discourse of architecture is lively, relevant and well-informed; hopefully, the benefit would be in the form of more coherent architecture. But there is certainly no need to apologise for the fact that research in architecture is likely to be of greater interest to thoughtful

and reflective architects, than to members of the general public. The belief, so often expressed among architects, that their activity and concerns ought, necessarily, to be extended so as to embrace and, even, to merge with the activity and concerns of the public at large, is a delusion. This can only lead to anxiety and frustration within the profession (and to a degree of irritation in the world outside). The writing collected in this volume is research, which will, properly, be of particular interest to those involved in architecture.

What unifies this collection of writing, then, is that it belongs within the discourse of architecture: what diversifies it is the variety of questions which have been addressed, the sources from which architectural knowledge has been produced. The immediacy or the comparative abstraction of the matters investigated, and the variety of thematic relationships to adjacent or complementary discourses and disciplines, adds to its cogency. It has been our intention to present the widest possible range of material (if only to establish, for the record, the range of issues which have surfaced within architectural discourse during the last ten years), as far as is possible, without imposing upon it a preconceived form or agenda. This, as a narrative rather than an hierarchical structure, parallels the editorial practice of *The Journal of Architecture*.

The seven headings under which we have assembled the material were not conceived as a 'shopping list' to be matched by the selection of suitable examples in each case. On the contrary, the headings were identified in order to give coherence to the range of the papers which we found ourselves wanting to include; they arose from the nature of

the more outstanding work. The reader should not expect to find, under any given heading, work of a uniform nature but, rather, that the clustering of work underlines the diversity of thought which writers have brought to apparently comparable topics. None of the sections is intended to be taken as a definitive or, in any way, comprehensive review of its subject. The research, which has illuminated the discourse of architecture over the last ten years, is to be understood as 'work in progress', of which the selection presented in this book may provide a snapshot.

We are presenting this material to reflect preoccupations which have figured significantly in the thinking of architects, and their critics, during the period under review, but also to lend substance to the notion of research in architecture which is not merely the shadow of research in another discipline. This is to empower, as far as a single publication can do so, the reflective, self-conscious and self-critical elements within architectural discourse. Inevitably, there was work of high quality worthy of inclusion but which, given the textual constraints to which we have been working, did not achieve the highest priority. These, inevitably difficult, decisions have been made in the light of consistent criteria:

- 1 The work was, in some way, surprising, substantially unlike anything, whether or not by the same author, which the reader would be likely to have encountered before or which is already available in a comparable publication. It could be seen to amount, in its own right, to more than an account of the content of

another piece of published work or the extrapolation of parallel or pre-existing work on a similar subject.

- 2 Irrespective of its topicality at the time of its first appearance, the work had retained its relevance in terms of the questions, preoccupations, hopes or anxieties which are alive in the discourse of architecture at the present time and likely to remain so in the foreseeable future. Much that may, at one moment, have seemed to be critically important – and the ‘debate’ concerning the architectural future of the city of Berlin is a case that comes immediately to mind – failed, in the event, to transcend its local and provincial import.
- 3 While drawing, as any critically self-conscious writing will, on concepts originating in a variety of discourses, a specifically architectural dimension – the architectural engagement of the ideas presented – was decisively recognised and embedded in the work.
- 4 The work was, in some sense, exemplary: either in the power of its discursive structure, the precision of its analytical method, its ability to

construct a coherent field from apparently inchoate material, or its effective use of unconventional procedures. It was able to stand as a model beyond the scope of its immediate content.

- 5 The writing was lucid, accessible, convincing and pleasurable to read: we have promoted that which was open-minded, generous and forgiving while tending, on the contrary, to pass over fractious or petulant writing whose critical objectivity was tainted by particular or general sentiments of superiority or disapproval.

But then outstanding pieces of writing have a way of demanding attention irrespective of one’s preconceptions. Subjects are seldom endowed with intrinsic interest; rather, any subject has the potential to become interesting or to remain imaginatively inert. The vitality of architectural discourse can be measured in its power to reveal significance in aspects of the subject previously assumed to be without interest, and *The Journal of Architecture* has, from time to time, supported such insights.

Foreword

In my practice, we have always valued research as a key contributor to success, so one of my first actions after my election as President was to help establish Research and Development as one of the principal committees of the RIBA. In its first year, that committee made important strategic contributions to the UK Government's latest Research Assessment Exercise (RAE), initiated an annual Symposium to discuss leading research in selected areas and created a new scheme of awards for excellence in research. Thus the RIBA's duty as a learned and professional society to foster research is receiving a higher profile.

However, the need for this had already been recognised by the establishment of *The Journal of Architecture* over ten years' ago. This lifespan and last year's increase from four to five issues a year, together with substantial recent rises in web access to its articles, mean that we can now be confident that this unique international research journal will exist for the long term as a vital feature of the RIBA's contribution to architectural activity and knowledge. This Anthology of some of the work published in *The Journal* since 1995 celebrates and identifies a proportion of the great range of interests represented in practice, schools of architecture and cognate disciplines throughout the world. Our aim for the future is to reflect the wide span of the RIBA's interests and its worldwide network by attracting an even greater number and variety of contributions from colleagues in all countries.

Finally, I pay tribute to Allen Cunningham and Peter Gibbs-Kennet, the co-founders and co-editors of *The Journal*, whose determination over many years to create such a journal and stewardship of it since 1995 place the RIBA and the profession worldwide considerably in their debt. I also extend the RIBA's warmest gratitude to our highly supportive publisher Taylor and Francis/Routledge and its staff, and to the co-editors of the Anthology, James Madge and Andrew Peckham, for their shrewd choices and introductory texts.



Jack Pringle
President, RIBA, 2005–07
Partner, Pringle Brandon Architects

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Part 1

Architects and the practice of design

This section is identified with contemporary preoccupations related to design as an activity. Taking issue with different aspects of Modernist orthodoxy, a set of interests intersect.

One paper is informed by themes associated with the cultural legacy of Gottfried Semper. Gevork Hartoonian's elaborate exegesis on *Frank Gehry: roofing, wrapping, and wrapping the roof* concludes by addressing the 'formal voyeurism vested in computer-generated images'.

The other two contributions are concerned with different interpretations of what might be termed 'creative' wilfulness (displaced, internalised or contextualised). Karin Jaschke in *Architecture as artifice* revisits the 'configurative design' (misconstrued as 'structuralist') of van Eyck and Hertzberger. Its surreal connotation, and Situationist affiliations, are seen to promote a psycho-spatial playfulness (cathartic or otherwise) at odds with structural 'discipline'; reassuring to its architects, as much as its occupants. Robert Levit's *Language, sites and types*, in contrast, judiciously interprets Siza's compositional strategies, which are seen to be informed by a series of ambivalent dualities. Identifying archaeological metaphors intrinsic to a 'nagging self-consciousness', a complex set of 'uncoordinated orders' are revealed in his work.

In Hartoonian, Jaschke and Levit's texts, one might tentatively identify a critical perspective, or the subject of an architectural practice, that embodies a sense of unease about its own plausibility. This prompts a discursive inquisitiveness about the consequences of a particular logic, narrative explanation, or articulation of form. While wary of appropriating, too literally, aspects of literary metaromantic discourse (theorised by Paul Hamilton), a common reflective mode and sensibility informs their practice of criticism, and the qualities of the architectural design presented here.

Language, sites and types: a consideration of the work of Álvaro Siza

Robert A. Levit

Siza's architecture is remarkable for its precise accommodation to sites. Since the 1970s it has shown a more explicit reliance upon typological forms. Both aspects of his work suggest an architecture anchored to history. Yet, for all the importance that site and type seem to play in Siza's work, they emerge as strange protagonists. Although tightly calibrated to site, Siza's architecture reveals the remoteness of the past, establishing an intricate contrast between itself and the underlying site. Types are deployed, but the hierarchies of our movement through them, of implied architectural promenades, seem to occur against their grain – as if the historical orders manifest in types were inherited instruments of a remote and somewhat alien past. This article delineates these phenomena in Siza's work, and reveals their genealogy in the historical milieu out of which Siza emerged.

I would like to start my discussion of the Portuguese architect Álvaro Siza's work by first considering some texts frequently cited in discussions of his projects: one by Siza himself, one by his mentor Fernando Távora, and another, a poem, by Portugal's most celebrated poet from the first half of the twentieth century, Fernando Pessoa.

'My architecture does not have a pre-established language nor does it establish a language. It is a response to a concrete problem, a situation in transformation in which I participate. . . . In architecture, we have already passed the phase during which we thought that the unity of language would resolve everything. A pre-established language, pure, beautiful, does not interest me.'

Álvaro Siza, 1978¹

'Those who advocate a return to styles of the past or favour a modern architecture and urbanism for Portugal are on a bad path . . . "style" is not of importance; what counts is the relation between the work and life, style is only the consequence of it.'

Fernando Távora, 1962²

Tenho tanto sentimento
Tenho tanto sentimento
Que é frequente persuadir-me
De que sou sentimental,
Mas reconheço, ao medir-me,
Que tudo isso é pensamento,
Que não senti afinal.

Temos, todos que vivemos,
Uma vida que é vivida
E outra vida que é pensada,
E a única vida que temos

É essa que é dividida
Entre a verdadeira e a errada.
Qual porém é verdadeira
E qual errada, ninguém
Nos saberá explicar;
E Vivemos de maneira
Que a vida que a gente tem
É a que tem que pensar.

*I'm so full of feeling
I'm so full of feeling
I can easily believe
I must be sentimental
But when I mull this over
I see it's all in thought,
I felt nothing whatsoever*

*All of us spend
One life living it,
Another, thinking it.
And the only life we have
Is split between
The true one and the false.
But which is true
And which is false
Nobody can explain.
And as we go on living,
The life we spend's the one
That's doomed to thinking.*

Fernando Pessoa³

All three texts reveal currents of feeling and thought that are distrustful of language. Pessoa poses his point, in his broad appeal to the reader – ‘all of us,’ that is – as a general human condi-

tion. He suspects that in all of us thoughts run like a parallel stream beside a ‘life that is lived’. Language has its own independent logic. We tell stories about ourselves, define experiences, judge events, and give voice to our feelings. Yet what we tell ourselves follows on the structure of language as given to us. The murky liquid dynamism of life is poured into the ready mould of language without convincing us that something is not left out in the shape assumed. The events of our life take on the form of known narrative structures. We see taking form in ourselves the shadow of a *bildungsroman*, a cinematic melodrama or life as advertised. Ready words name our sentiments, and we love, we miss, and we grow angry according to the elaborate histories connected to the words that name these sentiments. Meaning – even that conveyed by a rudimentary individual word – is divided up in certain arbitrary ways, as a simple attempt at translation from one language to another readily demonstrates. Although inevitably and endlessly falling prey to the preformed patterns of thought, intimations of another life shimmer out of thought’s reach on the horizon of consciousness. (Pessoa’s trickiness lies in not calling that sense of the incommensurate the glimmerings of a truer life, but pointedly supposing that no such judgement is possible: ‘But which is true / And which is false / Nobody can explain’.)

Álvaro Siza’s and Fernando Távora’s statements suggest that something analogous has occurred in architecture. Távora rejects what he calls ‘style’, which is really expression that no longer seems properly linked to its content – expression that

seems superfluous to meaning, mere flourishes. He favours something instead that will grow out of the relationship between 'work and life'. Siza, a student of Fernando Távora and a lifelong friend, echoes the older architect's sentiment: he rejects 'pre-established language' and seeks to respond to a 'concrete problem, a situation in transformation in which I participate'. In architecture they aim for that utopia where form would be neither an arbitrary inheritance nor an arbitrary system, but would grow directly out of our needs, and those needs' interaction with our environments, and most generally (if also most vaguely) out of who we are.

Yet what does all that mean? It reminds me of an analogous ambition ascribed to the 'American action painting' of Pollock, Kline, de Kooning *et al.* by their champion and critic, Harold Rosenberg. He said that this painting 'at its inception was a method of creation – not a style or look that pictures strove to achieve'.⁴ The paintings were records of human gesture unmediated by the treacherous pressure of thought and preconceived images.

But what could this mean in relationship to architecture, an art that is by its very definition premeditated? First we draw, then someone following what amounts to instructions must build. Architecture is neither a very spontaneous process nor is it very receptive to those patent contrivances that try to transpose 'automatic' drawings to the built realm. To understand how these statements, or theoretical ambitions, relate to architecture, and to understand what consequences they finally had on Álvaro Siza's work, we shall have to trace two parallel histories. The first relates to the under-

standing developed by the previous generation of Portuguese architects – among whom Távora played a significant role – of Portuguese vernacular architecture, and of the impact it had on their thinking. The other historical thread that needs pursuing relates to the development of the architectural promenade: there the notion of a mobile subject reflected a changed perception of the subject and its relationship to the architectural object. Of particular importance will be the conceptual precedent set by the way these changes inscribed themselves in Le Corbusier's work.

In the Portugal of the 1940s and 1950s, two developments lent depth to the feeling of at least one group of architects that the country's architecture was falling into a set of empty stylistic patterns. The fascist dictatorship of the Estado Novo (as the regime was called) had adopted a narrow range of models by reference to which they were able to promulgate a homogeneous state manner – monumental, even when small; quasi-neoclassical in appearance; modern in functional considerations (Fig. 1). Following a familiar fascist pattern, it proffered this architecture as the sole and unique representation of a single and historically homogeneous Portugal. It did not matter that this architecture, drawn from a version of the past adapted to contemporary programmatic demands and the heroic goals of the state's self-representation, looked little like any of the traditional Portuguese architecture from which it purportedly drew its legitimacy. Just as the representation of the state in the guise of a stern father leading a Portuguese nation as if it were an extended family required the repression of real

Figure 1. Praça do Império e Espaço, 'The Portuguese World', 1940.

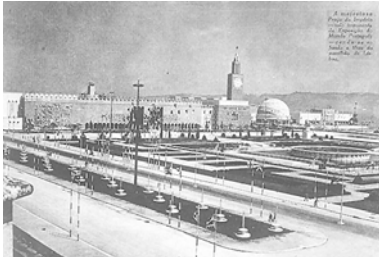


Figure 2. Portuguese vernacular: farm buildings, Minho region.



political differences, so too did the architecture mandate an artificial stylistic homogeneity. The state in a sense held language hostage, and lent an exaggerated urgency to the suspicion of language's treachery.⁵

The second development came from the increase in private and commercial building in the country. Large numbers of citizens working abroad and returning to Portugal to build homes or businesses – a pattern that persists in Portugal today – had encouraged the construction of buildings in many imported architectural styles. Their roots within entirely different urban, climatic, technological, material and social circumstances, and the contrasting uniformity of many towns and countrysides of Portugal, made these new buildings appear quite bizarre.

Architects, led initially by Keil Amaral and later including Távora, sought in the traditional vernacular a model of architecture to which they could look as a remedy. They eventually produced a thick survey called *Arquitetura Popular em Portugal*, in which they documented, region by region, the

varieties of vernacular architecture in Portugal. What they sought in the vernacular was a form of building without resort to 'style', or what they called 'constants', by which we can understand formal norms. Although they chart typologies within the body of the book, in the introduction they deny the importance of type. They are afraid that from types a 'Portuguese architecture' might be sought and reified into a code, just as the state had done with its models. They flee from the stifling and betraying codifications that are language. They do say that the buildings reflect, although not in types or specific architectural elements, 'something of the character of our people' in terms of a tendency to domesticate and turn 'humble' certain traits of the baroque. Exactly what that is, which must be some formal characteristic – simplification of contour, for instance – is purposely left unsaid. Instead they point out the 'strict correlation' in those buildings 'with geographical factors, as well as economic and social conditions'. They are 'simply direct expressions, without intrusions nor preoccupations with



Figure 3. Plan of Oporto.

style to perturb the clear and direct consciousness of these relations'.⁶ Paulo Varela Gomes, in his brief but excellent synopsis of Portuguese architecture, has called the thinking reflected in this book a 'metaphysic of the relation between work and life'.⁷ The vernacular is seen as the unmediated and, shall we say, prelinguistic product of life and its conditions. I would again bring to mind Rosenberg's idea of 'American action painters' whose work did not *represent* the being of the artist so much as it was an unmediated trace, or record of the artist's life in action.⁸ These buildings are like tools, transparent to their human task (Fig. 2). They bear the logic that brought them into being: the task to be performed, the hand that will need to grip them, and indirectly that aspect of the society reflected by the very existence of the need to perform that task to which the tool

is dedicated. The sign is not yet broken into the arbitrary relationship between the signifier and the signified.

Whatever degree of truth there may be in the supposition that form has a more natural relationship to 'life' in the rural communities and regions from which these architects drew their examples, the central fact of unselfconscious reproduction and incremental modification of traditions is lost and inaccessible to the very selfconsciousness that goes in search of it in the vernacular. If the vernacular were merely a model for how to produce buildings in harmony with one's contemporary circumstances, these architects' work might have been more like certain traditional strands of modernism. They, like Hannes Meyer, might have tried to eliminate the question of language by focusing exclusively on modern techniques of construction and solutions to contemporary problems. But there was something in the actual formal character of the vernacular that was appealing to them.

The architecture grew in an incremental way and not, as they pointed out, with great concern for formal precepts. Buildings accommodated themselves to the existing conditions of their sites. Buildings attached to walls allowed themselves to be shaped by those walls. Both walls and, to a large extent, buildings allowed themselves to be shaped by the contours of the land. Much of Portugal is hilly or mountainous, and much of the building in towns and countryside exhibits the highly irregular figures that result from this conformity to the landscape. They created an angling, fragmented, mosaic pattern across the countryside.

Even in major towns, the streets are rarely straightened, nor is the geometer's mark to be found in the squares. These too still bear the geometry of original terrain-driven figures (Fig. 3). There is then a general absence of an architecture of *a priori* geometrical form; building maintains the legibility of the antecedent world into which it is built – that is, the rolling forms of the earth – and its slow, incremental pattern of addition and growth are visible; new building does not raze old building. The vernacular has an archaeological effect whereby its own history and natural history are inscribed in its form. In this respect it satisfies some of those objectives sought out by its investigators. When Siza began to practice in the late 1950s and early 1960s, many of these characteristics would have had an effect on the strategies he adopted. How his work diverged from this model, however, will intensely reflect the remoteness of the unself-conscious practices of these rural communities.

The other significant historical strand that threads into Siza's work pertains to the relationship between the development of architectural promenade and the notion of a mobile subject. The historical evolution of architectural promenade, originally connected with landscape architecture, posited a human subject that would no longer contemplate from a single point of view a static and graspable order. It would move through a sequence of landscape environments meant to stimulate constantly varying states of sensations. Watelet, credited with making the first picturesque garden in France in the 1770s, thought (in Robin Middleton's words) that 'the essential enjoyment of a landscape arose from the constantly changing experience enjoyed as one

moved through it.'¹⁹ The focus of the subject's attention in the garden shifted away from the apprehension of ideal geometries, or the formal relationships that seemed more important in the conceptual schema of architecture, to a focus on the continuous changing passage of sensation. A person involved in the appreciation of his or her own sensations will distinguish between these sensations, corporal and intimate, and the remoteness of an architecture's abstract autonomous conceptual order – unless of course that order, as the eighteenth-century garden theorists sought for their gardens, is dedicated to the peripatetic subjects' perceptions.

The transformation in the attitude towards the relationship between subject and object heralded by the promenade's focus on a sensorial rather than conceptual order is significant with regard to this essay's original discussion of language: if in the hierarchy of things greater value is placed on an apparently direct appeal to human sensation, certain orders whose presence can be thought without immediate reference to perception – ideal geometrical schema, for example, or the fugitive and intangible persistence of types – will appear more alien despite the fact that they too are apprehended by the human mind. Even though the environment geared toward the satisfaction of a thirst for 'sensation' may be as rigorously orchestrated as the driest geometry, an apparently more spontaneous and natural appeal will be made to a self apparently involved in a more spontaneous and natural response. Forms arranged with a mind to this arousal of sensation and related to our 'free' movement will seem like a more 'natural' and

human language, while what we might call conceptual orders will seem more and more obdurately alien – artificial and ‘other’, like the cloak of reified languages that will not conform to the uniqueness of each human being.

Le Corbusier was obviously interested in this wandering person, and the *promenade architecturale* was a central theme of his work. By giving the promenades a representative physical figure and by making this figure distinct from the idealized order established by structure (columns and slabs), he was able to construct an architectural metaphor of the disjunction between an idealized order of architecture and the order of the peripatetic subject of sensations. Thus stairs and ramps in his architecture not only facilitate the actual movement of an individual through his buildings, but just as ergonomic furniture suggests the absent body for which it is designed, the twisting ribbon of stairs – on the left as you enter Villa Savoye, or on the right as you enter Villa Stein – suggests the phantom of that promenading subject. The same is true of the ramps at Savoye, at the Mill Owners, and at the Dr Currutchet house. These components of circulation follow the logic of the ‘free plan’, and are distinct from the structure of the architecture. Thus the ‘free plan’ not only distinguished between those eternal orders that the structure would embody against non-structural infill, but proposed a distinction between an idealized space and order and the incidental aspect of human passage. Whether we are thinking of the universal space of the columnar grid or the endurance within it of a certain Palladian aspect – the ABABA rhythm of



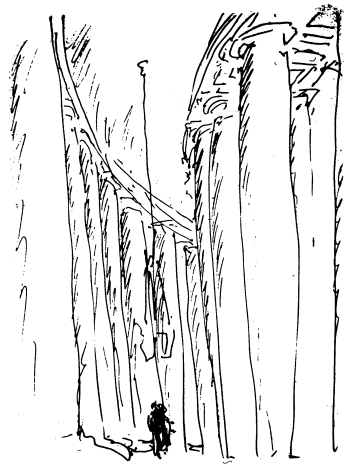
Figure 4. Approach to Salemi: drawing by Álvaro Siza.

Stein's structural grid – the percouse through the emblematic Stein house wanders ‘freely’ across the grain. The columnar space is either a modern shell to be inhabited or a ruin through which we amble. We can thus extend the metaphorical scope that the ‘free plan’ allows for: the stairs and ramps incarnate our contrary patterns of movement. But the ‘free plan’ also identifies an enormous amount of what is connected with the particularization of space, the establishment of those hierarchies of dwelling connected with different rooms, windows, and their figurative aspects with the notion of a kind of permanent furniture. The apsidal wall of the Stein dining room is like a piece of furniture, while the bookshelves that are furniture and

Figure 5. Fountain at Spanish Steps, Rome: drawing by Álvaro Siza.



Figure 6. Colonnade of St Peter's, Rome: drawing by Álvaro Siza.



conceptually impermanent are used to articulate the space of the l'Esprit Nouveau living area. Furniture is what we bring to a building. It reflects not the preordained order of the architecture but the more personal act of our moving in and dwelling. The 'free plan' thus suggests that all those freed materials are a kind of furniture within and distinct from the principal order of the architecture. It is evidently very much part of Le Corbusier's work. He created a dialectical opposition between an architecture of idealized order indelibly inscribed by the marks of a subject that is an other in the very midst of the architecture that shelters it.

Siza's sketches reflect his own relationship to that notion. Architectural, urban, and landscape settings are always shown from a point of view that implies the unique moment of perception of the seeing subject. The drawings do not submit to the 'proper' order of the architecture; we do not see from the vertex, for instance, of a perspectival space: the drawings infrequently attempt to construct the objective description of, say, a plan. In the collection of drawings published in 1988 as *Travel Sketches*,¹⁰ scenes are cropped or viewed at odd and casual angles whether they are of classical buildings, spaces with baroque coordinating principles of preferred unbroken axial

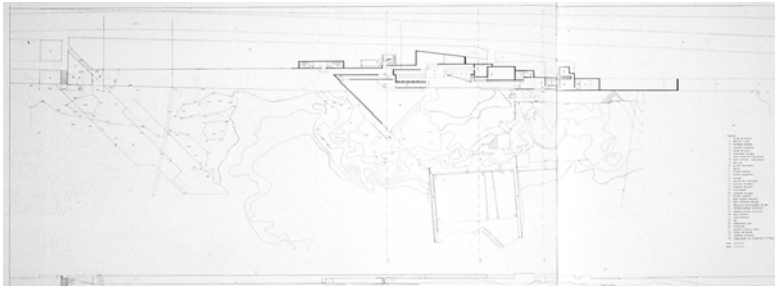


Figure 7. Pool at Leça de Palmeira: plan.

views, or ordinary street scenes. In a manner similar to that of the hand-held camera, and with similar rhetorical effect, they represent views taken in while one casually ambles down a road or sits in a room or café. As in a sidelong glance, things are seen distorted, or as the view drops too low, the foreground's intimate proximity is juxtaposed onto public distance (Figs 4–6). Here we might think of that comparison made by Panofsky between the 'objective' distance and framing of St Jerome in his study by Antonello da Messina and the intimacy of Durer's engraving of the same subject, which places the viewer at the very frontier of the room, the foreground rushing up, thereby making one feel on the verge of crossing through the study to St Jerome himself.¹¹

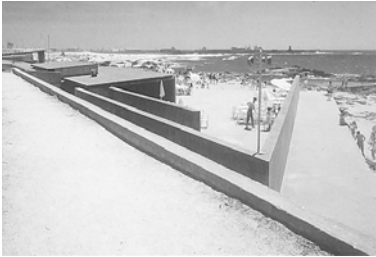
Siza's sketches make us think of the changing views taken in during a stroll. Each sketch stands emblematically for one in a series of succeeding views, implying the uninterrupted stream of our perception as we move through the space of city and country. Possibly by association with the

techniques of photography and film and their connection with immediacy and unmediated (non-conceptual) recording, there is the feeling of an 'eyewitness' account – of being there.

Architecture is the background to life lived. As in Le Corbusier's example, it retains the marks of our human use of it. Landscapes, rooms and streets are filled with voluble human activity – people promenading, talking, buying and selling. Other scenes retain the clues of someone's recent passage: rumpled clothing sits on a chair, laundry is left hanging to dry. Inanimate things retain their obdurate separateness but are criss-crossed and marked by human activity. Buildings and landscapes thus appear both remote and enmeshed in the resulting tangle.

These drawings create the peculiar sense that we hover just before the drawn scene. They suggest the physical presence of the voyeur at the very site of the sketch. In literal terms, in some drawings Siza allows his own feet and hands – hands caught in the act of sketching the drawing

Figure 8. Leça de Palmeira: pool to sea.



we are now looking at – to enter into the drawing's frame.

Architecture thought of as the consequence of the relationship between work and life, and the reconceptualization of the subject according to notions of sensation and the promenade – these are the two fields of thought through which I would like to examine some of Siza's projects. Although the chosen group of works cannot exemplify the full range or complexity of his entire opus, it does touch on persistent and central themes.

One of the reasons the vernacular was able to represent to Távora and his colleagues their notion of a natural language had to do with its historicity. As an accretive process that maintained the evidence of the historical circumstances of its making – the topographical conditions to which it responded, and the accumulated agglomerations of an architecture continually added upon without erasure of preceding layers – it represented an architecture revealing the process of its own becoming. Maybe it did not so much demonstrate the naturalness – whatever that might mean – of

its forms in relation to life itself; however, its archaeological qualities suggested the historical record of life's needs. Such effects depended on the passage of real history. But there is a manner in which Siza's architecture produces an analogy, or more properly, a representation of this process, although with an effect quite different from the original. As a representation, it is not the thing referred to any more than a painting of a landscape is a landscape. The very selfconsciousness of the metaphorical construction of this historicity also leads to certain complications. There is a nagging selfconsciousness – legible in the architecture – that suggests that the archaeological metaphor also reveals the loss of the very continuity or natural historical process that it seeks to represent. The act is estranged from the very foundations that set it in motion.

One of Siza's early projects is the beach-side public pools in Leça da Palmeira (1961–66) (Figs 7 and 8). One portion of it is a series of intermittent parallel concrete walls and slightly sloped roof slabs running in parallel – some at a slight angle – and backing onto the face of a concrete boardwalk. The roofs (when they exist) and the walls form few closed corners but instead, in *de Stijl* fashion, slip by each other. Of those closed corners visible in the plan, many are in fact buried underground and thus hidden from view. Roof slabs reach beyond the edge of walls or are separated by deep reveals that create the illusion that they float – independent of the walls below. The beach itself is full of large formations of craggy rocks, and the various swimming pools are formed by the conjunction of the open figures of low concrete walls and the

rock formations. Other elements amid the rocks are cast concrete stairs, ramps and platforms, whose regular shapes are set within the rocks and sand, and dive into the beach's jagged formations.

This architecture is intimately calibrated to its site; the pools hold water only through the collaboration of existing rock formations and the newly cast concrete walls. The group of parallel walls at the back of the site is like a delaminated extension of the boardwalk, its edge echoing in layers into the territory of the beach. And concrete is made from sand. Nevertheless, there is something alien about this architecture on the beach. The hard-edged forms of the concrete planes – straight or, in one small instance, smoothly and geometrically curved – do not enter into endless negotiations with the particulars of the terrain. Those portions of the project that enter into the territory or rocks stop and start as dictated by the natural formations, but they do not become distorted in an attempt to accommodate themselves. Walls, platforms and roofs do not fuse with the landscape, but form a kind of interrupted tracery over it, a kind of drafted graffiti. And instead of a literal historical accumulation of artefacts deposited over time, they offer something more akin to the primal markings of a draughtsman over the territory. They seem more like the emblems of drawing than of building.

Yet this drawing is no simple matter either: the syntax of slipping planes and spatial porousness has something of that original spatial generality, or placelessness as it has been called, that was a quality of the *de Stijl* vocabulary; it lurks in the pattern language of this project. Like the gridded

canvases of Mondrian or the brick country house of Mies, the spatial order – because there is nothing finite about it, no closed figure – suggests the possibility of the pattern's extension: beyond the frame in Mondrian's case, or as a latent and hidden order in the continuum of space with Mies's house. In the *Leça* project, the tendency to understand the language in relation to this more abstract extension makes the project feel that it lies there with a certain indifference between the new layer and the existing material of the site. We could imagine a series of traces, dashes and hovering planes proliferating in collage fashion along the beach and beyond. And here lies the crux of one form of equivocation in the project. The particular arrangement of forms is particular to place, but hints at an abstracted indifference. The porous spatial paradigm of the syntax allows the site to visibly pass through it. Contrast this fact with the effect of an intact closed spatial figure or completed type, where the nature of its autonomy would tend to close out the site, making the interaction and layering less continuous as the figure stated its formal independence. Here the formal syntax is everywhere autonomous, everywhere infiltrated by the site.

The constant contact between the space of the architecture and the space of the natural site binds them in an archaeological fashion of layers, at the same time that the layer of nature is an alien intrusion. The site is colonized without submitting to human reformulation, and thus suggests an archaeology or historicity where the past – that is, the existing site or its representation – remains alien to us. The proposition is for an archaeological

Figure 9. Boa Nova tea house, Matosinhos.

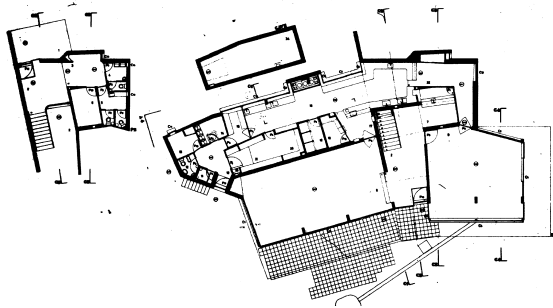


Figure 10. Boa Nova tea house: plan.

intimacy that will not admit a naturalness of relation to the past.

The project suggests an architecture that, like graffiti, is drawn on the site. In this sense, the layers of archaeology have to do with the act of conception and design settling upon the material of the existing. But as with Le Corbusier, we are also given little emblematic traces of our own peripatetic passage through the site. The ramps and the stairs are like those set into the background of the columnar grid's spatial ideality. Here similar ciphers now have as their alien background a real site. The conceptuality of the architecture's syntax, conceived of as intimately bound and alien to site, is echoed by the littered trail of ciphers that put our phantom presence amid a world of rocks that we can touch but cannot change.

Yet, describing the Leça da Palmeira pool project exclusively as a syntax of slipping planes is not entirely accurate. The large pool is an incomplete rectangle. One of the parallel walls along the boardwalk folds out at a 45° angle, as if to suggest the project's precinct. However, its acute angle and implicit extension to the ocean horizon – there is a trace of its geometry at the seaward end of the large pool – tend to establish its definition as a wall dividing endless space rather than defining a figure. In other projects of this period the *de Stijl* character of the syntax gives way to interlocking groups of incomplete figures. This is the case in such works as the Boa Nova tea house (1958–63) (Figs 9 and 10), the Alves Costa house (1964) (Figs 11 and 12), the Alves Santo house (1966–69), and the Rocha Riberio house (1960–62). In each of these projects

a certain more 'architectural' character is proposed for the project: the projects adopt a somewhat more traditional vocabulary, using pitched roofs of ceramic tile; also the more traditional notion of rooms and spaces as closed volumetric figures is suggested. Yet in each case these figures are stated in abbreviated form: they are open Ls as in Boa Nova, or as in other houses a variety of fragmented Ls, unequal-legged three-sided rectangles, or other more difficult to name fragments, as well as simple straight wall segments, attached to nothing. The open figures nestle within each other and overlap.

In one respect the effect of these broken figures is not all that different from the open matrix of sliding planes. Space – whether conceived of as that universal spatial continuum of modernity, or as the actual but open space of a palpable portion of the world (a site) – flows through these fragments. The projects propose a sort of Trojan horse of conventional architecture, whose syntax, upon inspection, dissolves into a series of fragments. Space, or site, passes through them just as it does through the walls of the pool project. In the Alves Costa house, an emblematic moment occurs at both the front door and at the garage. At both these points, fragmented figures overlap trailing walls, like stiff streamers, into the field of another figure. These trailing walls disrupt the sense of closure that the figure into which they penetrate might otherwise offer. Thus the virtual closure suggested by the figural fragment is conceptually undone, and the reading of an open spatial syntax of walls – dividing up space – is forced upon it. In the garage, in particular, a low extension of the east wall of the house slides under the open

Figure 11. Alves Costa house: view.

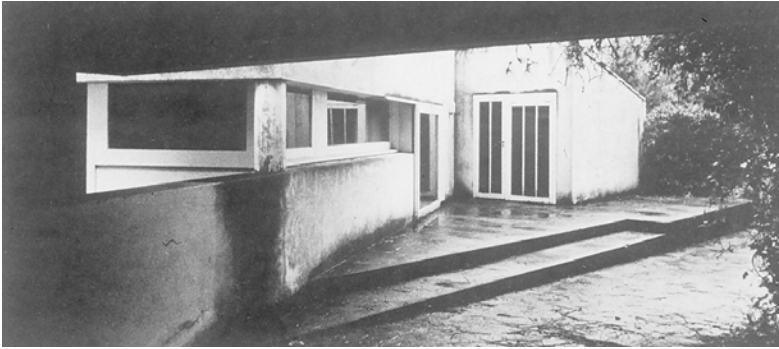
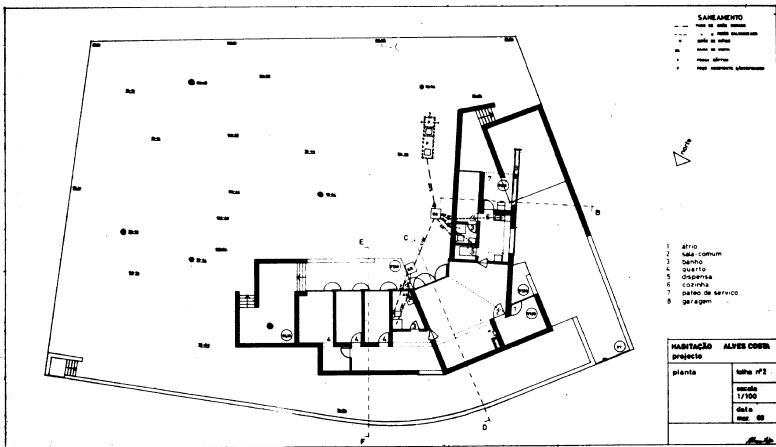


Figure 12. Alves Costa house, Molebo do Minho: plan.



hanging corner of the structure, while the wall extends into the figural domain of the house. Both walls, each a part of a figural fragment, disrupt the spatial integrity of the other fragment into which they penetrate. The two figures' conceptual identity flip-flops as these walls are understood in one instant as boundaries of space, in the next as overlapping dividers of space.

As with the pool project for Leça, the syntax of the Costa house is spatially porous. The conceptual transparency to the field of the site, the conceptual presence of that field in the midst of the very figures enclosing the dwelling space of the house, presents the house to us as intervention 'layered' into the site, an open sketch on the site – and thus the persistence in these projects of the archaeological metaphor.

The figurative expectations that the fragments set up – the expectation of closure that might have been absent in the more apparently modern and *de Stijl* syntax of the pool – in some respects amplifies the peculiarity of a conceptual intrusion of the site into the house, even in the absence of great rocks.

The percouse into the house adds another peculiarity. With the apparent conventionality of the ceramic tiled roofs and the bounding figures, the expectation that one might move through the building in a more conventional pattern also grows. Yet instead of, for instance, passage into a bounded room through a cut in the wall – a threshold, that is – at the front and back doors a person would move between the fragmentary figures as if they were a landscape of ruins. Here we begin to see a theme that will develop with

more didactic clarity in the succeeding projects: the notion of how the subject is placed in contrast to the weight of latent conventions of architectural figures begins to emerge. The split between how human movement and perception are orchestrated exists in contrast to certain conventionally apparent orders of the architecture. Such a contrast begins to create an architectural corollary to the sketches we have described.

From the 1970s Siza's work begins to exhibit more explicit uses of type. In projects for housing we see a pattern of *siedlungen*-like town houses (the SAAL housing at Bouça, 1973–1977, and São Victor, 1974–1977, both in Oporto; and housing in Caxinas, 1970–1972). In several other projects we begin to see the repeated use of a U-shaped courtyard scheme (the Pavilhão da Faculdade de Arquitectura, Oporto 1984; the Carlos Siza house, 1976–1978; and the Escola Superior de Educação in Sétubal, 1986–1992).

Certainly, the concept of type is tricky, and has changed over time. But let us say, for instance, that the U that appears many times in Siza's work is a configuration of form that wakes in us a chain of associations with other like configurations. It tends to be nameable, because it is that very characteristic – that it belongs to a category – that constitutes the being of types. What I have referred to as syntax in the case of the pool does not constitute a nameable configuration. It is more in the nature of a strategy or pattern of form than a nameable entity as a type must be. Thus although Siza did use such syntactical patterns, he was able to avoid a certain aspect of that initial anxiety about pre-established languages. Flexible spatial

patterns appear to be more spontaneous and less burdened by history than types.

Yet because the type has a certain integrity as a conceptual category, it also implies a kind of closed autonomy; its stable and independent conceptual existence is a form of aloofness. And it is here that it becomes susceptible to the suspicions voiced by both Távora and Siza as well as Pessoa. It is not 'style'; but it has something of style's formulaic nature. It is not language, but like language it seems public rather than intimate; like words, types seem to exist independent of us. Thus types were held in suspicion by Távora and his colleagues because they suggested the possibility of a reified formalization of architecture. And even though the vernacular may have been susceptible to a typological survey and analysis, what was held to be appealing in the vernacular was its qualities of flux, its qualities of historicity – its layering of past and present – that seemed a palimpsest of its becoming. We should note that, like the language we speak, type's impersonality is susceptible to that endless reformulation that allows all learned languages to acquire clandestine and utterly unique qualities added by each speaker. The resonance of a word is created by the unique world of each mind, and diction and grammar are shifting sands that reflect the biologically infinite permutation of speakers and history. But types also never lose their fundamental correlation to the historical things by which they steal away from the actual and specific into a realm of remote concepts and categories.

Types would seem to work against one complex and essential aspect of Siza's archaeological

metaphor. The manner of layering so far described has suggested a simultaneous intimacy and estrangement between the layers of new project and site. The transparency and conceptual incompleteness of the formal language of the project that allowed the 'intrusion' of the site's alienness into its midst is not obviously in the nature of the type. This is so because the type tends to be a closed or at least a finite world, which tends conceptually to close out or reorganize in its own manner what lies outside it. It may rest archaeologically on what precedes it, but it excludes those things through its own internal cohesion.

Siza uses a variety of strategies to 'attack' this integrity, enabling him to persist in constructing a relationship between site and intervention (as each project should be called in his work) that binds them without naturalizing their relationship. He also deploys certain strategies that metaphorically present the alienness of the type, as an inherited formal construct, in relation to a subject that cannot see itself reflected in that inherited order of architecture.

The Pavilion for the Faculty of Architecture is a U-shaped building, a species of the three-sided courtyard (Figs 13 and 14). It is set at one end of an enclosed garden. The garden is oblong, and its entry is on one of the long sides towards the far end from the pavilion. From that vantage point the building remains hidden by a large clump of bushes and small trees. The U-shaped form of the pavilion also is pinched, and tapers towards a large, old tree that contributes to its concealment. Although the project opens up in the direction of



Figure 13. Pavilion for the Oporto Faculty of Architecture: overall view.

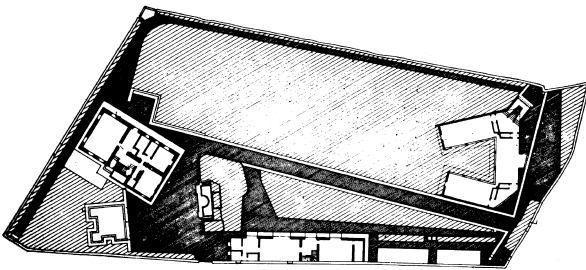


Figure 14. Pavilion for the Oporto Faculty of Architecture: site plan.

the garden's principal axis – that is, it faces or embraces the space of the garden in the direction of the patio area of the garden entrance – the path to the building and its entry follows another order of logic. Gravel paths lead along the two edges of the rectangular green in which the pavilion sits, and onto which it opens. To enter the building, it is necessary to skirt the whole garden edge or walk along the nearer side of the green and around the side and back of the pavilion. The entrance is a one-storey box shoved into the corner of the project furthest from the garden entrance. It is a circuitous route – a surprising location for the entrance, because the courtyard's configuration suggests a more formal solution to its approach and entrance. It has latent in it an axiality to which the garden is susceptible. Yet neither the approach nor the location of the entrance acknowledges such latent implications. Lest we forget that such implications exist, a small bay protrudes at the middle of the rear along this central axis – although this too, as it is deflected asymmetrically in its shape by its contact with a virtual bounding line around the building, only puts an equivocal emphasis on the axis.

The building has no base but for a thin black line of tile set flush in the white wall, nor is the ground in any way specially prepared for the building. It is significant that the building's figure, on one side and at the back, is caught up in the geometrical organization of the ground plane, but there is no sense of accommodation at the point of contact between building and ground; at the short end of its arms and along the side of the far arm the building sets right down into grass as if

it were a model or play object set down upon a living-room carpet.

Perhaps habitual percourses around the edge of the garden drove the logic of a corner entry, now hidden and far from everything else in the garden. The inherited order of the object is treated with the kind of indifference that we might imagine in reinhabiting a ruin, or building the new city around it, as happens in Rome. New windows and doors are cut into an ancient edifice; new street patterns are laid out with no necessary regard for its original order or hierarchy or organization. It is as if the building were a piece of nature to be colonized. I exaggerate to make my point, because clearly each decision of dimension, shape and location has been considered. But the cumulative rhetorical effect seems to suggest these purposeful contrasts and superimposed counter-orders. The building is in many ways, like the pool at Leça, calibrated to its site, yet that calibration feels more like an exploration of how disparate things may be set together, existing simultaneously yet disturbing one another as little as possible. So here now is the found object of the pavilion; the grass might as well pass right under it. A promenade wends its way around the garden, momentarily leaving hidden this built visitation to the site, and there, in the intimacy of the garden corner, we enter the building. The entry provokes a local eruption in the fabric of the building, and an entirely localized figurative event occurs, as if marking the type with an event of human passage, as the stairs, ramps, or other such materials had occurred against the background of the columnar grid in Villa Stein or Villa Savoye. The type then



Figure 15. Carlos Siza house: view.



Figure 16. Escola Superior de Educação: view.

becomes a kind of ideal background for a human promenade, as occurred in Le Corbusier's work against the background of the space idealized by the columnar order.

In the Carlos Siza house (Fig. 15), the effect of this artifice of apparently aleatory relationships between different layers of order is more radically visible. This project too is a pinched U. Its central axis is marked by the living room's protruding bay window. Here too, entry is made casually from the corner, although in this case one enters into a sort of ambulatory that enfolds the courtyard of the house. In this house the 'indifference' to site is more radical. The house sits on a raised base. At a certain point along one edge of the site, the raised plot's perimeter wall folds sharply back into the house, passing through one leg of the U and conceptually cutting off three of the bedrooms from the rest of the house. Through the typological figure, an element connected with site passes in a formally disruptive fashion through its interior. Some rather extraordinary readings are possible as a consequence of this event. The three bedrooms

seem to be simultaneously outside the house and within the garden precinct while still legibly within the figure of the U. The courtyard, which is properly an extension of the garden space into the heart of the house, is now outside the garden beyond the cutting diagonal of the garden wall.

A third event of an entirely different sort is superimposed upon the superimposition of site and type. An optical cone of vision is cut from the centre of the dining-room window, twisting the geometry of two columns; dimensioning along its trajectory the two opposite windows of the courtyard; aligning, along radials drawn from the cone's vertex, the dividing walls of three bedrooms; and popping out from the far side of the house a little bay window of sorts. Vision is inscribed as another uncoordinated order into the fabric of the building. The indifference of one order's logic to that of another suggests the independence of each. The rhetorically aleatory nature of their relationships suggests the foreignness of one to the other – that is, they constitute an archaeology of architecture, represented by typological formations or as in Leça, with

syntactical strategies, site, and the order of the subject. Each is intimately bound to the other, yet alien.

It is possible to trace these themes through many projects. In the *Escola Superior de Educação in Sétubal* (Fig. 16), the three-sided courtyard opens to an undulating landscape that rolls into its arms. Distinct from the *University of Virginia* example that ought to come to mind, the project does not so much classically frame a landscape beyond its orderly tranquility as prompt this very landscape to wash right into its midst. The sequence from the parking lot or from the road running along the building's opposite flank leads to one of the legs of this project's open courtyard that is longer than the other. To signal its peculiar role within the typological context, as the initiation of an entry sequence along this leg back to the building's principal vestibule on centre at the base of the courtyard, the columns kneel – that is, incline – and the roof drops down as if in the gesture of a canopy. Ramps link the various elevations of ground brought together at this surprising moment. Within, a pattern of circulation that hints at the latent symmetry of the project unfolds as a series of unique events out of kilter with the 'proper' order of the plan, as if to highlight the contrast between promenade and purported order.

The oddity of the paths to the building, traversing along the rolling grassy landscape from one side, or through an apparently casual closed patio placed at an angle to the long leg of the building, makes this building seem to lie unexpectedly upon the ground. Paths unrelated to the logic of the building bring us to the 'wrong' part of

the building to initiate our entry into it, and the internal pattern of circulation carries on to similar effect. We wander the building as vagabonds about the ruins of Rome.

Our trace and mark appear upon the body of Siza's buildings in other ways. Physiognomic figures in facade patterns lend a strangely human aspect of gesture to the body of many of Siza's buildings. In the totemic boxes of the *Oporto Faculty of Architecture studio buildings (1986–1993)* (Figs 17 and 18), different 'characters' are detectable, one with close-set eyes, one glancing west, and one, a Cyclops, looking ahead. The skylights of the easternmost studio seem like a creature from John Hejduk's architectural bestiary. Yet all these gestures are not so surprising; they, like the optical cut in the *Carlos Siza house*, inscribe within the body of the architecture the roving subject's perceptual experiences. These windows through which we see represent that act of seeing in a rhetorical gesture. Behind, a ramp rises along the face of the classroom and lecture hall building, and the gliding glance that peers out during the ramp's ascent is cut from the building's face – the slope of the roof suggests the ramp inside but is steeper, making the cut of the ribbon window, which follows the angle of the ramp, more palpable as a gash in the façade – that is, the cut is not 'explained' in relation to the building's sloped profile.

It bears noting that the gateway pairing at the west end entrance to the *Faculty's campus* is contradicted by the change in section that runs along the axis that they establish. Entrance is made through a flared vestibule stuck into the face of

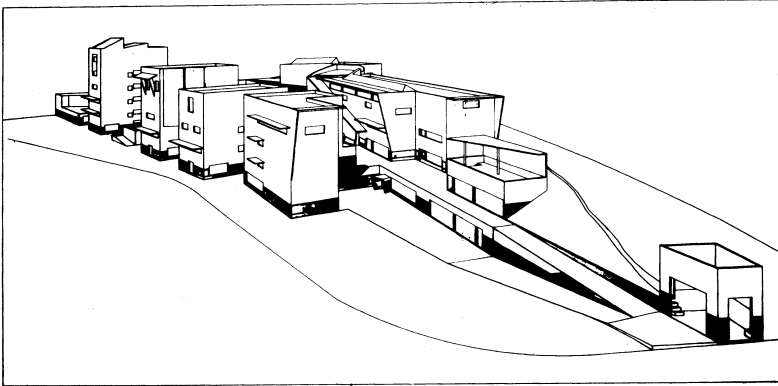


Figure 17. Oporto Faculty of Architecture: perspective.

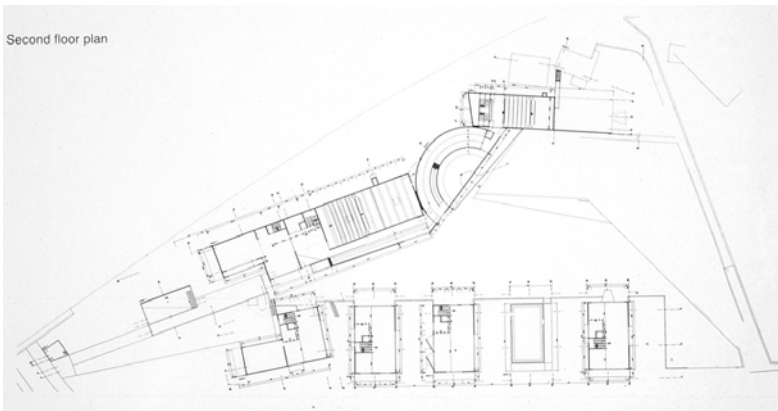
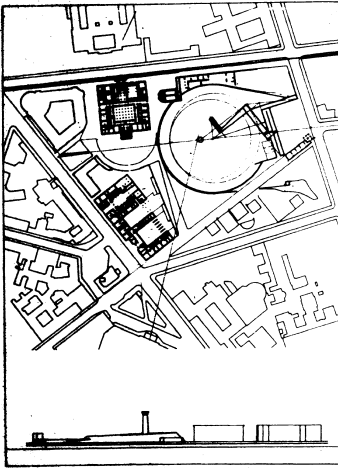


Figure 18. Oporto Faculty of Architecture: plan.

Figure 19. Monument to the Victims of the Gestapo, Berlin, 1983: plans and elevations.

Site plan and elevation



Plan of the roof and elevation

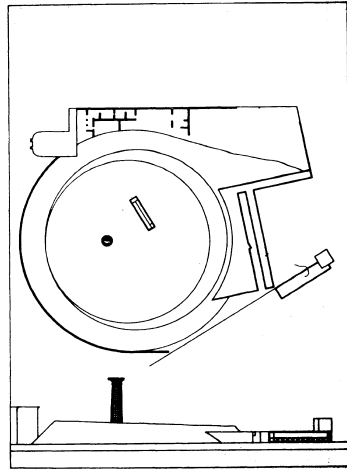
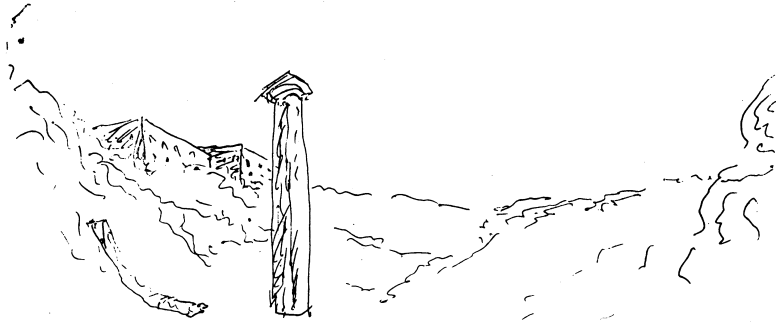


Figure 20. Monument to the Victims of the Gestapo: drawing.



this sectional change, or up a flight of crossing stairs and into the bottom of the ramp's figure. The markings of path about the building and the anthropomorphisms play similar roles, leaving a trail of marks on the building, suggesting an order of movement and perception overlaid onto the more stable order of forms. The project is set on a steeply inclined bank of the Douro River; the split in section is in fact related to a mosaic-like pattern of platforms into which the embankment is cut. Thus its disruptive role is, again, the superposition of the non-conforming patterns of site and architectural configuration.

One project summarizes particularly well the themes I have tried to highlight in Siza's work. The competition entry for the Monument to the Victims of the Gestapo, Berlin (Figs 19–21) is somewhat anomalous in a body of work that on no other occasion contains an explicit component of the past's classical vocabulary. Here, eccentrically located in the middle of a large round bowl of landscape, stands an inhabitable doric column. Inside, a spiral staircase nearly fills its shaft and runs up to its capital. The site plan shows the column at the intersection of important axes – one running down the centre of the street, another running nearly perpendicular to and from the centre of an adjacent building's monumental façade (this latter axis is slightly displaced by the corner of an interceding building). Where the two axes cross stands the column. Yet the column's location, in spite of this apparent logic derived from the larger order of the site, and following baroque notions of monumental urban arrangement, still stands strangely within the immediate surround-

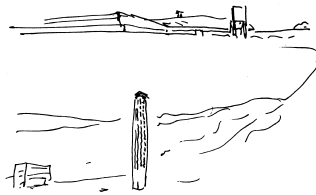


Figure 21. Monument to the Victims of the Gestapo: drawing.

ings of the monument. It stands within a great round built earthen landscape bowl, which is itself located within an outer ring of bermed land. Set down into this landscaped bowl, with its base and much of its shaft hidden from sight from without, the visible portion of the column floats disembodied, cut off from the ground. The axes, severed from the column by the ambiguous form created by the landscape bowl's exterior, fail to stay the column within that larger urban order from which they emanate.

The fragmented sequence from the small plaza – which the project makes through a group of oblong buildings at the end of the approach street – to the column within the bowl continues to disrupt one's understanding of the formal continuity of column and city. Through a series of small tube-like buildings (their entire cross-section is identical with the corridors they contain) one enters on axis with the column at the centre of the plaza's principal bounding façade, tacks back and forth once, into a slot-like corridor open to the sky, then, once again centred, enters a passage that protrudes into the slot at an acute angle and

ramps down a now-covered passage with a row of columns down its centre. Through one more corridor, now with ceiling sloped along its length following the slope of the bowl above, one arrives with another change of direction at a switchback ramp, enclosed but open to the sky. One finally rises up and out into the bowl – at a point off-centre and off the principal axis, although on a radius defined parallel to a diagonal street adopted in the arrangement by portions of the project's geometry. Here one turns right and, looking across the centre of the bowl, sees the column standing off-centre to the right.

The buildings analysed in plan all belong to one or another of two principal site geometries. However, I imagine that the effect of moving through the building is to distance one from the city through a certain disorientation, and to allow for a passage into the bowl-shaped park in which the column stands – stranded. Here this explicit emblem and trophy of a past architecture stands removed from its own 'natural' context – once a component within the syntax and body of a classical building and from its possible normative relationship to the city, established by the classically conceived urban axes, and perceptually undone by the bermed bowl in which it stands isolated in a garden. Under such conditions it is not unlike those nineteenth-century follies that were merely occasions within the more important order established by the narrative-like sequences of experiences in picturesque garden promenades: in those cases the dominant experience of the folly was not the reconstitution of the historical universe from which the folly came, but a more general and

emotive nostalgia for a lost world. Follies, like collections in general, signify not the presence of the collected object so much as the absence of the world from which a relic has been saved.

What then is the connection between this project and the purpose to which it is dedicated – a memorial to the victims of the Gestapo? The column appears in the city like some found object of a world lost, its withheld relationship to the larger city only making more poignant the absent world of ordered relationships of which it is an emblem.

The following is possible: the column can be viewed as a relic of a classical past – possibly of that classical humanist past whose vision assumed an organic continuity between man and the world, where man remained linked to the world around him by virtue of the analogy he saw between himself and the forms of the world. His own subjectivity was not rootless among the world's autonomous objects and events, but shared in their order and could thus reform it. He imagined that the image he held of his own developing rationality could infuse the world, and if this rationality produced a humane order, then the world would be humane. Humanism could tame the obdurate alienness of the world by seeing 'the human subject . . . incorporated into the dance of forms filled by the world' and should not be betrayed by this world. The human disaster perpetrated by the Third Reich, driven by an image of history that negated the importance of the individual subject, divides us from such classical humanist hope. The column, once homologous to man and a great emblem of the humanist reciprocity between world

and subject, is now only a nostalgic artefact to be collected but incapable of integration within the city that survived the disaster.

It is also possible that the column is full of more frightening associations derived from its historical association with power, and more particularly with the neoclassical affectations of the Third Reich. In this case, we would stumble upon this symbolic structure collected from the wreckage, defanged in its museological park. Both readings are possible, even in one person. As they oscillate, what remains constant is the remoteness of history, its irrecoverability. When the past is conceived of, it is called history, and at that moment under the glass jar of a name it is as remote as is the world from which the items in a collection have been drawn.

The column is a ruin collected from a lost epoch. The pieces of architecture by which we are brought to it, guided in their layout by the geometry of the surrounding urban site, still gather as if merely part of a series of abutted fragments. By passing through them, we happen upon this lone column. The column, sited by an elaboration of the existing site's order, remains unjoined and alien in the city's midst. Such might be a parable of the memory of those victims within present-day Berlin.

Siza's architecture emerged from an epoch that sought to recover from the betrayals of language and the misuse of history. The sense of language's remoteness, the uncertainty of our own relationship to inherited forms and even to the historical soil on which we build is codified in an architecture that joins subject, land and language, without suggesting that there is anything natural about such a grouping.

Notes and references

1. Peter Testa, *The Architecture of Álvaro Siza* (Oporto, Portugal, Faculdade de Arquitectura da Universidade do Porto, 1968), p. 39.
2. Paulo Varela Gomes, 'Quatre batailles en faveur d'une architecture portugaise', in *Europalia 91: Portugal Points de Repère: Architecture du Portugal* (Brussels, Fondation pour l'Architecture, 1991), pp. 41–42 [my translation].
3. Wilfred Wang (ed), *Álvaro Siza: Figures and Configurations, Buildings and Projects 1986–1988* (Cambridge, MA, 1988), n.p. Poem cited from *Fernando Pessoa: Selected Poems* (Chicago, Swallow Press, 1971), translated by Edwin Honig.
4. Harold Rosenberg, 'The concept of action painting' in *Artwork and Packages* (Chicago, University of Chicago Press, 1969), p. 213.
5. The historical thread of my argument here draws largely upon the article by Gomes, 'Quatre batailles en faveur d'une architecture portugaise,' pp. 30–62.
6. *Arquitectura Popular em Portugal* (Lisbon, Sindicato Nacional dos Arquitectos, 1961). Quotes are from the unnumbered pages of the Introduction. The translations are my own.
7. Gomes, 'Quatre batailles en faveur d'une architecture portugaise', p. 42.
8. See Rosenberg's discussion in Harold Rosenberg, 'The American action painters' in *The Tradition of the New* (New York, McGraw-Hill, 1965), p. 27.
9. From Robin Middleton's introduction to Nicolas LeCamus de Mezieres, *The Genius of*

- Architecture or the Analogy of that Art with Our Sensations* (Santa Monica, CA, Getty Center for the History of Art and the Humanities, 1992), pp. 48–49.
10. Álvaro Siza *Esquissos de Viagem/Travel Sketches* (Oporto, Portugal, Documentos de Arquitectura, 1988), series edited by Eduardo Souto Moura et al.
11. Erwin Panofsky, *Perspective and Symbolic Form* (New York, Zone Books, 1991), translated by Christopher S. Wood. See Figs 18 and 19, pp. 174–175.

Architecture as artifice

Karin Jaschke

The photographs through which Aldo van Eyck's orphanage building in Amsterdam first became known and famous, were shot shortly after its completion in 1960 by the photographer Violette Cornelius. In a stroke of genius, Cornelius photographed not only the building, but also let a couple of children feature prominently in the pictures. They were captured absorbed in play rather than posing and appeared as the main subject of some of the pictures. The series as such represents a noteworthy moment in the history of architectural photography but it is also symptomatic of certain characteristics of the architecture which centred around the Dutch journal *Forum* in the 1960s. Edited at the time by Aldo van Eyck and the young Herman Hertzberger, *Forum* was promoting a new and more humane understanding of modern architecture, inspired most importantly by van Eyck's 'story of another idea' and the corresponding 'configurative design.' A body of architectural work emerged around this thinking, which one could loosely call *Forum* architecture, and which, besides the orphanage, includes the well-published contributions for the Prix de Rome of 1962 by Piet Blom and Joop van Stigt, Herman Hertzberger's later *Centraal Beheer* and numerous other projects, and which is frequently discussed as Dutch structuralist architecture. Herman Hertzberger explained in 1967 that:

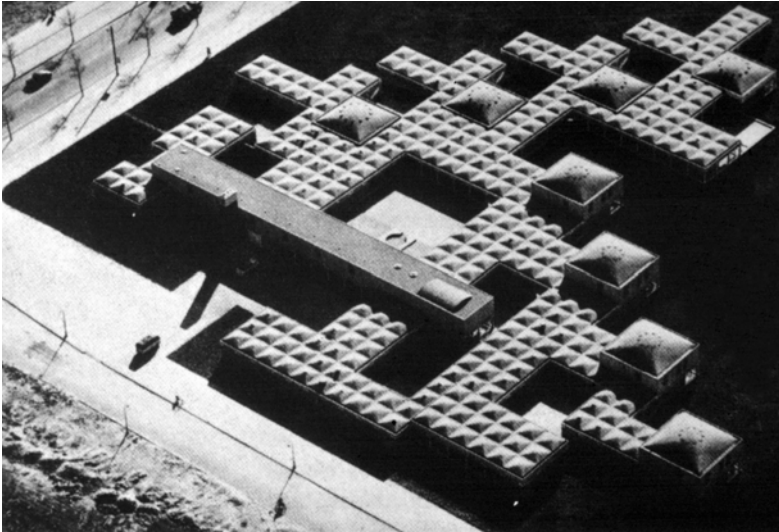
the overriding element in what we have called 'the story of another idea' is a concern to preserve the identity which threatens the more to get lost, the greater the numbers we are

dealing with; it is a struggle against the amorphous, the additive and the unnaturally split-off, the consequences of plurality getting out of hand; it is the concern for a positive grip on large numbers to assure that even in the largest areas of mass living each individual will know 'that he is somebody living somewhere' that everyone's identity will be guaranteed; that is all in all what A. v. E. called the configurative.¹ (Fig. 1.)

In the attempt to counter the 'amorphous' and 'additive' nature of the modern city, configurative design worked within the logic of structural modules and with functional indeterminacy rather than with classic or modernist compositional principles. However, the configurative grids, modules and clusters had themselves an oddly amorphous and additive character. The architectural forms and indeed formalisms which resulted from the configurative approach were such that critics tended to defer their formal judgement in favour of an evaluation of the theory behind the architecture, a consequence of which has been the often contradictory or simplistic analyses of 'structuralism' in the field of architecture.

Rather than to demote the formal characteristics of configurative design to a necessary consequence of an allegedly structuralist theoretical edifice behind it, this essay attempts to understand configurative form through the role assigned to the 'user' by the architect and interprets its psycho-spatial effects as a reflection of surrealist concerns with

Figure 1. Burgerweeshuis Orphanage by Aldo van Eyck, Amsterdam 1959.



subjective space. It will be argued that, while strangely reproducing a form of the amorphous characteristics of the modern city, described as denying the mass of users the possibility of identifying with their surroundings, configurative design challenged the users to play for their right to identify precisely by offering an architecture devoid of functional, iconographic or typological pedigree, an architecture antithetical to the idea of *architecture parlante* and, in fact, an architecture reminiscent more of playing fields and gameboards than of conventional buildings.

One of Aldo van Eyck's programmatic formulae was that of a 'casbah organisé,' an alluring concept throughout the 1960s which implicitly promised the relocation of organisation from the architect to the users. Looking at configurative projects with this in mind, in drawings, on site and importantly in the photographs of Violette Cornelius and others in her wake, the ordering structures, mostly constructive grids, which might appear simplistic, can actually be seen as signifying the *absence* of an order and an invitation to the user to develop a more complex and socially rooted organisation than architecture

as such would be able to offer in the first place. Architecture appears in the guise of a gameboard, which remains mute as long, and only as long, as there are no players to occupy the space and develop their own order, their own rules. It is left to the users to establish an ordering structure in these buildings, as implied in Violette Cornelius' series, where the children are not only playing *in* the building, but rather, are playing *with* the building. As she realised, *Forum* architecture was best understood by observing the users at play. The meaningfulness of the orphanage and other projects in its wake depends in this sense intrinsically on the presence of their users. Indeed, when left alone and looked at as object-architecture, *Forum* projects appear deserted and even uncanny, an observation which will be considered below. (Fig. 2.)

Forum architecture has tended to address in particular the socially weaker sections of the population, the aged, children and students for instance, and stands as such in the broadest sense in the tradition of socially engaged modern architecture. However, the motif for this general concern with the 'weak' user was different from that of earlier modern architects, certainly in the case of Aldo van Eyck. His interest in children was motivated largely by a belief that the innocence and spontaneity of children were able to infuse the architectural framework, provided by the architect, with those positive qualities which in van Eyck's expression, turn space into place. This represents a form of modernist primitivism, whereby the potential perceived in the 'primitive' object, here the user, was returned or applied to the 'primitive.' In this way it differed from

the classical modernist primitivism of certain Cubist or Expressionist artists, whose interests in the 'primitive' object were largely self gratifying. Configurative design proposed that the user take possession of the built structure. It thus introduced a sort of alternative concept of ownership, a psychological ownership, which resonated with anthropological notions of property and phenomenological ideas on inhabitation. Configurative design assumed an ethical as well as a political position.

A telling parallel to the attempt to engage the subject in space, one which is sustained by factual connections in Aldo van Eyck's biography, is to be found in surrealist experiments with the space of the city and its mythological dimension. Surrealist investigations and configurative design share to some degree the concerns, methods and effects of what one could call a participatory primitivism. While the full extent of this common ground must be explored elsewhere, it is interesting here with regard to the peculiar play of presence and absence that is unfolding in configurative architecture and which was captured so sensitively by Violette Cornelius.

Although Aldo van Eyck was among the first categorical critics within CIAM, and with the Smithsons a leading member of CIAM's successor, Team X, he pledged lifelong allegiance to that section of modernist art and architecture which he described as the true avant-garde and called 'the great gang,' namely 'Picasso, Klee, Mondrian, and Brancusi; . . . Joyce, Le Corbusier, Schönberg, Bergson and Einstein.'² While studying in Zurich around 1940, he made the acquaintance of

Figure 2. From Violette Cornelius' series of photographs of Aldo van Eyck's Orphanage building. (© Violette Cornelius.)



numerous artists especially from the surrealist circles, and was also introduced to the art scene in Paris, in particular to Tristan Tzara and Constantin Brancusi. From this time date his fascination with ethnographic material and to a degree the anthro-

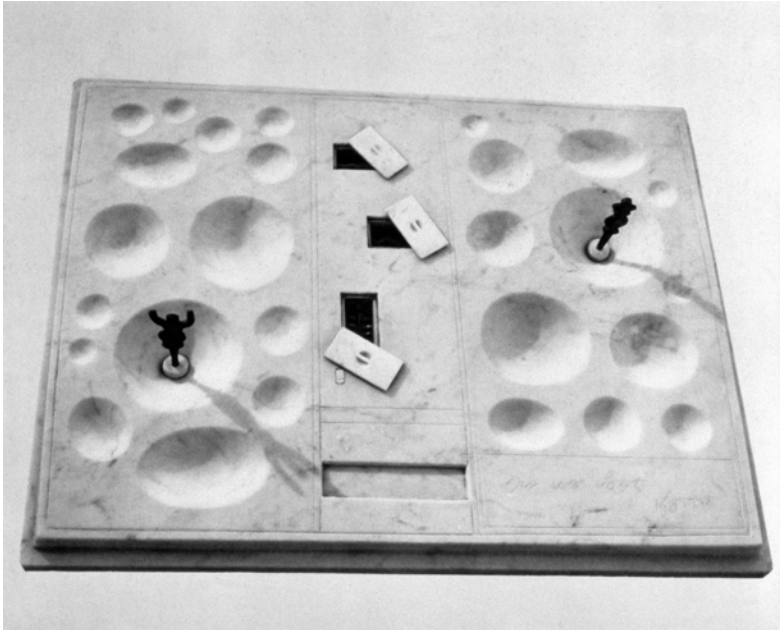
pologising tendency in his thinking. His familiarity with surrealist ideas is clearly reflected in his later architectural philosophy which was in turn determining for the *Forum* journal.

The connection between the city and a mythological ground as its working basis is made by Surrealist artists as much as by van Eyck and the configuration (or reconfiguration) of a spatial setting through its occupant was a prominent theme in surrealist experiments as well as in van Eyck's and other configurative design, albeit with the difference that the *Forum* architects had no Paris at their disposal. Aldo van Eyck stated that, 'the city proper is the counterform of society's reciprocally individual and collective reality. It is because we have lost touch with this reality – the form – that we cannot build its true counterform.'³ This formal reality was intricately linked for van Eyck to a lost or at least hidden mythology, whose recovery was important yet fraught with difficulty. He declared, 'if we, today, are unable to read the entire universe and its meaning off our civic institutions as the Romans did – loss or gain – we still need to be at home in it; to interiorise it; refashion it in our own image – each for himself this time,' and quoting Joseph Rykwert, he continued, 'it is no longer likely that we shall find this ground in the world the cosmologists are continuously reshaping round us, and so we must look for it . . . inside ourselves, in the constitution and structure of the human person.'⁴ Van Eyck and the other *Forum* architects saw themselves operating in the all but sterile ruins of a modernism gone wrong, while the surrealists were held captive and nurtured at the same time by the rich sedimentation of nineteenth-century bourgeois Paris. Consequently configurative design needed to establish an experimental, artificial set-up 'from scratch.' Analogous to the Surrealist as self-styled 'primitive within' Paris, the

user in a configurative setting was meant to explore, discover and redefine space. In spite of the considerably different points of departure, the scenarios have common traits: the taciturn character of the structural grids of configurative buildings and the ostentatious presence of children in Cornelius' pictures conjure a similarly surreal atmosphere as the descriptions of the nocturnal, deserted Paris in Louis Aragon's writing.

Considered not so much as architecture, than as something akin to a playground, a gameboard or even a laboratory, configurative projects can usefully be interpreted as artifices placed in 'real' settings and necessarily different and distant from their surroundings: they can become concrete architectural entities in and through the social and psychological dimension only. The artificial framework at once attempts to haul in life, and to differentiate itself from the surroundings, to constitute a world apart. As van Eyck said regarding the orphanage, 'It was a strange disturbing problem, if you think of it: to make an environment for little cast-out people within the very society that cast them out.' He had the ambition to allow these children through the architecture provided not only to 'return to society untwisted,' but to go beyond that lowest common denominator by which he saw society operate. He wrote, 'There are things I think the children should do which the trustees most emphatically think they shouldn't – you know! I provided for those secretly – necessary things, necessarily nice.'⁵ Incidentally, these elements in the orphanage, such as the waterbasins, set-back areas and little mirrors or tinted glass panes elevate this particular building over many other configurative

Figure 3. Alberto Giacometti, *On ne joue plus*, 1932.



projects which lack this second layer that, like a dice in a boardgame, has a catalytic function in the use of the building. (Fig. 3.)

The artificiality which one can thus read in *Forum* architecture suggests a proximity of the projects to sculptural works. Indeed, the interpretation of Giacometti's gameboard sculptures from the early thirties, the period of his closest contact with surre-

alist circles, can shed light on the surreal condition which configurative architecture generates in its programmatic dependency on the user and which it shares with a certain Paris and other surrealist spaces. Giacometti's sculptures are commenting on the theme of absence and presence in a way which is relevant to an understanding of *Forum* architecture.

In the surrealist city, journeys and narratives were interwoven with the city fabric by the surrealist subject. It was a space of itinerant exploration, of movement and bodily presence. In Giacometti's gameboards on the contrary, an 'exasperating tension' results from the suspension of this perpetual itinerant flow, and a severed link between time, space and the subject.⁶ In the sculpture *On ne joue plus*, or No More Play, the premature end of a game is suggested in the title and evoked in the tombs and the skeleton at the centre of the board. However, rather than reading a simple 'tragic end' of life in the sculpture, art historian Jean Soldini interprets the set-up as a suggestion of resurrection, 'one could translate the meaning of the work in this way: There is no more play, hence life continues.'⁷ Similarly, *Forum* architecture, by insisting on the presence of a subject, may be said to contain the suggestion of an absence. It articulates the possibility of being or becoming abandoned, dead space, in the middle of life. Joseph Rykwert wrote in 1988, that 'when [his book] *The Idea of a Town* first appeared, as a special issue of the Dutch review *Forum*, its editor, Aldo van Eyck, suggested that it would serve as a reminder to architects of something which they seemed to have forgotten: that the city was not just a rational solution to the problems of production, marketing, circulation and hygiene – or an automatic response to the pressure of certain physical and market forces – but that it had to enshrine the hopes and fears of its citizens.' While not enshrining them, configurative design is dealing with the citizens' fears by confronting the users with the possibility of their absence. Both Giacometti's sculptures and

configurative design interrogate the subject's status in space and time.

Following Soldini's interpretation of Giacometti's sculpture, there would be an implication of resurrection and thus eternal reappearance in a cyclical model which could possibly be read as a critical comment on concepts of history and progress.⁸ Giacometti's gameboards are also challenging the participation and involvement of the beholder. 'The idea common to Giacometti's surrealist objects is to give a sculpture the form of a game or toy which in some way can involve the beholder in an active participation or a desire for it. It is a challenge, and even if he chooses not to play, prefers to stand back and fantasise about what it might be like to play, he is only making another kind of move in the game.'⁹ Thus in a way the beholder is to Giacometti's sculptures what the child is to the orphanage. The user as active participant gives sense and presence to the architectural structure. According to Rosalind Krauss part of the gameboard sculptures' importance comes from the renunciation of verticality, and thereby of the objectified, symbolic, representative dimension of sculpture. Giacometti's gameboards merge into 'the actuality of space and the literalness of motion in real-time.'¹⁰ This produces the disquieting, surreal condition of the sculptures. The real and the dream (or nightmare) meet in a frozen scenery, unmediated by a base or pedestal. Again, *Forum* architecture too, is characterised by a lack of border and centrality in relation to its surroundings as well as by a tendency to uncontrolled sprawling extension. The lack of a centred form in favour of a modular structure is to configurative design what the elimi-

Figure 4. Alberto
Giacometti, *Man, Woman,
Child*, 1931.



nation of the base means for Giacometti's sculptures. This might be an explanation for the projects' predilection for diagonal organisation. Giacometti's sculptures extended the artist's vision into the 'real' while *Forum* architecture invaded the real with its artificiality. (Figs 4 and 5.)

One could say that the *Forum* architects themselves related to their work in a way similar to certain surrealist artists? In the face of what could be called the excessive output of cubicles in *Forum*

architecture, the impression of a compulsive repetition of an earlier modernism's geometrical legacy arises, an unconscious attempt of the second generation to come to terms with a repressed trauma, the overwhelming presence of the older generation's obsession with Euclidean geometrical forms and cubic volumes. *Forum* architecture, looked at from a distance, exceeds both the functionally and the formally commensurate. As noted earlier, it is difficult to explain its formal aspect by common

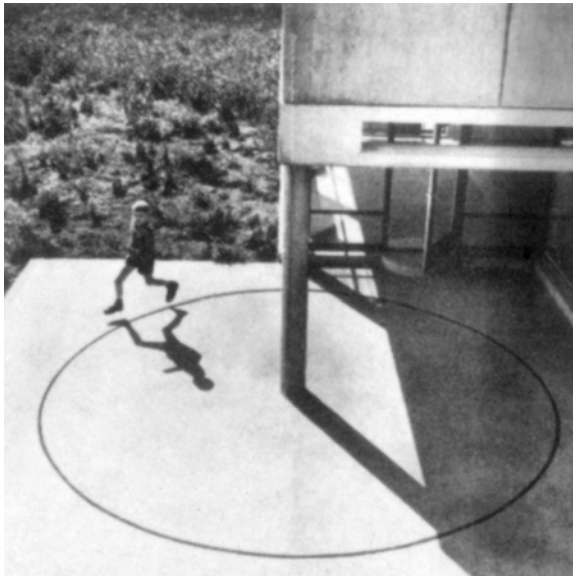


Figure 5. From Violette Cornelius' series of photographs of Aldo van Eyck's Orphanage building. (© Violette Cornelius.)

architectural criteria. More surreal work of art than building, configurative architecture may appear like the strangely familiar return of the repressed.

This means that the concern with the primitive as an element of configurative design manifested itself in one more guise. Namely in the reflexive urge to order, to occupy and to delimit infinite space, indeed, to deal with 'the greater number' and the 'amorphous.' The dichotomy of the fullness of life represented by the playing children and

the empty layout of the buildings which produces the surreal effect discussed above, is to be found not only in the sculptures of Giacometti's surrealist phase, but also in so-called Outsider Art and in the art of the mentally ill. There is on the one hand the need to get a grip on the apparently chaotic character of life through ordering principles such as repetitive patternmaking or geometric structures (a practice which is incidentally part of certain Eastern religious systems and meditation methods)

and on the other hand the depiction of the human figure and anthropomorphic representations which suggest a loss of control and emotional abandonment. In this sense configurative design may be interpreted as a psychologically cathartic exercise which would have benefited the architects as much as the users, who were promised an alternative kind of ownership of architectural space in return for their willingness to play with the architecture. In Aldo van Eyck's vision, this would have allowed urban society as a whole to occupy its cities as the counterform of a reconfigured mythological reality.

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3. A. van Eyck, 'The medicine of reciprocity tentatively illustrated', *Architect's Year Book X*, 1962, p. 174.
4. A. van Eyck, *Forum*, 17, 1963.
5. A. van Eyck, in Oscar Newman (ed.), *ibid*, p. 34.
6. J. Soldini, *Il colossale, la madre, il 'sacro-l'opera di Alberto Giacometti*, my translation, (Bergamo; P. Lubrina, 1991), p. 79.
7. *Ibid.*, p. 88.
8. Note that Giacometti was influenced by the same sources as van Eyck, through his involvement with the surrealist movement. In the case of the gameboards this included artefacts of the Dogon people from West-Africa on which Michel Leiris had reported in the surrealist publication *Minotaure* in the context of the Dakar-Djibouti expedition.
9. D. Sylvester, *Looking at Giacometti* (London: Chatto and Windus, 1994), p. 79.
10. R. Krauss, *The Originality of the Avant-Garde and Other Modernist Myths* (Cambridge, Mass.: MIT Press, 1994), p. 74.

Frank Gehry: roofing, wrapping, and wrapping the roof

Gevork Hartoonian

Frank Gehry's work has taken the architectural stage worldwide. Without theorising his work, Gehry has produced a sensible architecture that deserves serious examination. In many ways, his work speaks for the present problematic state of architecture; the long-standing relation of architecture to sculpture and other forms of artistic creativity; architecture's relation to its own history; the impact of telecommunication technologies on architecture; and the aesthetic implications of the commodity fetishism for architecture. Reflecting on these issues, the main intention of this essay is to demonstrate the permeation of the 'culture of building' in Gehry's architecture, in particular the Semperian discussion of the tectonic relationship between the elements of roof and enclosure. The paper also invokes Gottfried Semper's discourse on theatricality to demonstrate the way Gehry's architecture appropriates the present culture of spectacle. This much is clear from Gehry's shift from regionalism for the montage of fragmentary forms, and the theatricalisation of architecture where the element of wrapping defies the tectonic but also reminds us of the essentiality of the rapport between a constructed form and the clothing.

Introduction¹

Among participants in the MoMA's 1988 'Deconstructivist Architecture' show, Frank Gehry has come a long way in securing both institutional and public support. He is one of the few contemporary architects with little interest in theorising his work, and yet, he shares the neo-avant-garde's tendency to renew architecture by borrowing from conceptual art.² He is not, according to Francesco Dal Co, a passive recipient of ideas generated by contemporary artists, rather, he 'understands that it is possible to "occupy" with architecture, the spaces that art is no longer able to dominate, assigning to architectural design the task of taking the experiments of the historical avant-gardes

to their extreme consequence.'³ Throughout long years of practice Gehry has pursued a self-imposed challenge, to avoid leaving any kind of personal signature on his work. He has taken every commission as an opportunity to generate something different. With the Disney Concert Hall and most recently with the Guggenheim Museum in Bilbao, however, he has introduced a major note into the noisy debates on architectural theories and practice. But what will be the next turn in his architecture after Bilbao?

I ask this question because the language of the Guggenheim Museum in Bilbao evolved out of a paradox in Gehry's own work; that is an 'obsession' with the biomorphics of fish⁴ – as an emblem

of formal autonomy – and an aspiration for regionalism, especially the element of roof and workaday look of materials that were prolific in his early projects. Second, knowing the role of computer programming for the Bilbao project, one wonders if there is some formal limitation to computer-aided design beyond which a return to the orthogonal and the striated space of modern architecture seems still a viable alternative.⁵ This technical limitation has a theoretical corollary: how far can one stretch the formal implications of the ‘fold’, another favourite Deleuzian term in the neo-avant-

garde index, beyond what Gehry and others have already done? These limitations are evident in the ‘repetition’ that is haunting Gehry in his recent projects: both the addition to the Corcoran Museum and the Concert Hall for the Bard College present a mini-replica of Guggenheim in Bilbao, let alone his recent proposal for the Guggenheim in lower Manhattan (Fig. 1).

There is no intention to discuss Gehry’s complete work in this essay.⁶ Instead, it is intended to focus on buildings and projects which are pivotal for an argument of theatricalisation permeating his

Figure 1. New York Guggenheim, Photograph, Wit Preston, Courtesy of Gehry Partners, LLP.



present architectural practice. The metaphor of fish, with its twisting and bouncing body, is suggestive of an architectural image whose space could be wrapped beyond the dictate of the 'regulating lines' envisioned by Le Corbusier. To go beyond the horizontal and vertical datum of the tectonic, architecture might enter into the world of plastic arts where the tension between the art-form and the core-form, discussed by the nineteenth century architect Carl Botticher, evaporates.⁷ In Gehry's recent buildings the 'against architecture' of neo-avant-garde takes a critical turn: his work is informed neither by popular images of the main

stream of pop culture, nor by the agonies of metaphysics that are haunting deconstructivist architects. From a certain angle, the Bilbao building stands as a phantom-like image comparable to visual effects seen in the best Hollywood films (Fig. 2). It is a three-dimensional space modelled by the exuberant look of a commodity. Here architecture is not a stage set, around and within which an event could take place, but the event itself. Again, I am searching for a distinction between Gottfried Semper's discourse on the architecture of theatricality and the theatricalisation of architecture: one representing tradition materialistically, the other



Figure 2. Guggenheim Bilbao, entry plaza, from Francesco Dal Co & Kurt Forster (eds), *Frank O. Gehry: Complete Works*, New York, The Monacelli Press, 1998.

shifting tradition into the phantasmagoria of a commodity world.⁸

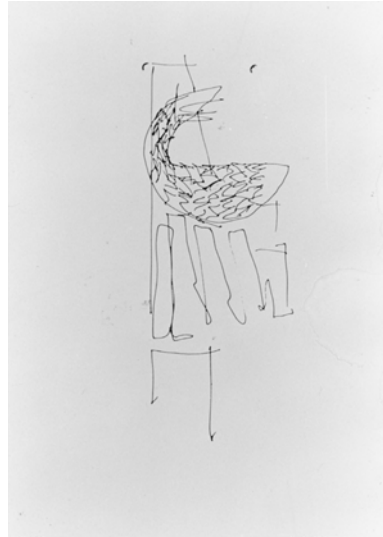
I wish to propose that the surreal quality of the Guggenheim Museum in Bilbao, a found-object with discrete charm, evolved out of Gehry's move from regionalism towards a montage of fragmented masses and volumes. In this mutation the year 1981 is important: in a housing project for Kalamazoo in Michigan, the entire landscape is marked and dominated by a free standing hotel envisioned in the shape of a standing-up fish

(Fig. 3). Here one witnesses the return of childhood memories of a fish as the emblem of both formal perfection and the 'other' that is charged with therapeutic function. 'The fish evolved further,' Gehry recalls in an interview, 'I kept drawing it and sketching it and it started to become for me like a symbol for a certain kind of perfection that I couldn't achieve with my buildings. Eventually whenever I'd draw something and I couldn't finish the design, I'd draw the fish as a notation' (Fig. 4).⁹ I would like to suggest that Gehry's

Figure 3. Central Business District project, Kalamazoo, Michigan, 1981, Courtesy of Gehry Partners, LLP.



Figure 4. Fishdance Restaurant, Kobe, Japan, Drawing, Courtesy of Gehry Partners, LLP.



architecture evolved out of a dialogue, at times confrontational, between a montage of fragmented forms and the plastic quality of folding surfaces that is analogous to the bouncing body of a fish.

Roofing

Consider the Steeves House and the Ronald Davis Residence built almost ten years apart from each other. In both buildings the roof stands out as an architectural element responding to the landscape and the region's vernacular tradition. The cruciform

plan of the Steeves House (Fig. 5) recalls the planimetric organisation entertained by Frank Lloyd Wright with the difference that the hearth (where two perpendicular arms of the plan come together) was for Wright the existential nucleus of dwelling whose architectonic presence is stressed either by the vertical expression of the chimney in the façade (the Robie House) (Fig. 6), or by a hovering roof that shelters the house like an umbrella (Ward Willitts House). Gehry, instead, approaches the crossing point of the Steeves House pragmatically. Here the crossing point makes room for the main

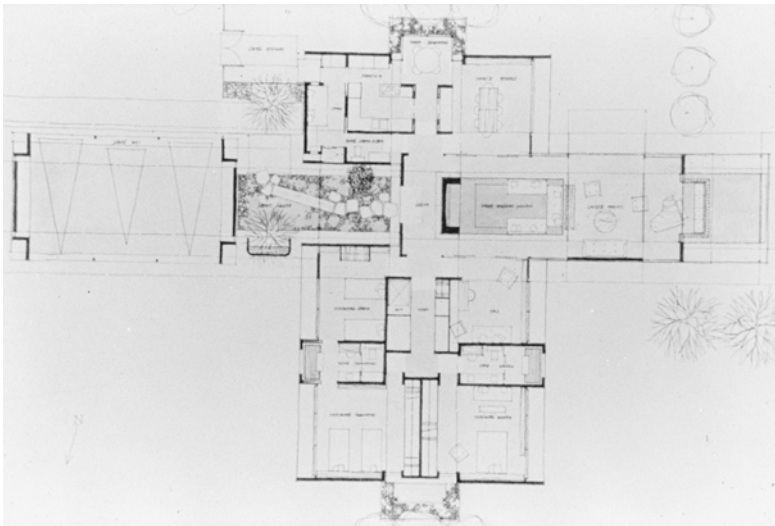


Figure 5. Steeves Residence, Brentwood, California, plan, Courtesy of Gehry Partners, LLP.

Figure 6. Frank L. Wright, Robie House, Chicago, 1909, courtesy of the author.



entrance, keeping the bedroom wing apart from the other three wings. The horizontal roof of this house (Fig. 7) is another element that could be associated with Wright's design in the Goetsch-Winkler House built in Okemos, Michigan. Again, absent in Gehry's approach is the importance Wright would assign to the roof not only at a tectonic, but also at a metaphysical level. In the Goetsch-Winkler House, the roof attains its particular form by being anchored to the entrance. Should the absence of narrative of the kind Wright would weave in tectonic forms be considered as a weakness in Gehry's architecture? Even a positive

response to this question can't deny the attention Gehry gives to the client's needs and the landscape of California, thus endowing the architecture with regional qualities. In the Steeves House the roof stretches out to make openings for a patio and a pergola above the living room. The split body of this roof generates a draft cooling the patio and lets the light penetrate indirectly to the living room and the garage.

Gehry's vernacular sensibilities attain a different level in the Davis Studio and Residence (Fig. 8). A two-bedroom house with a painting studio, this house is conceived almost like an overturned box,

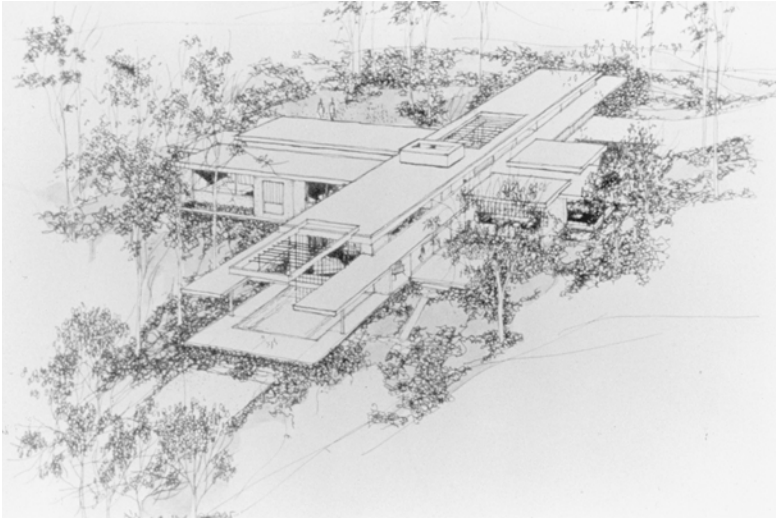


Figure 7. Steeves Residence, Brentwood, California, drawing, Courtesy of Gehry Partners, LLP.

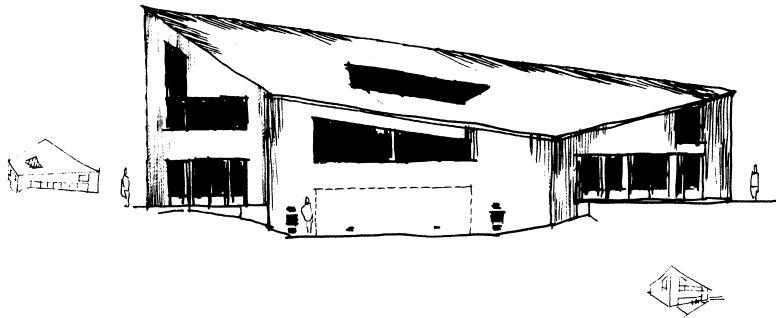


Figure 8. Davis Studio and Residence, Malibu, California, 1972, sketch, Courtesy of Gehry Partners, LLP.

several volumes that are connected to each other by wooden stairs (Fig. 9). The space between the shell and the interior volume acts as a passage overriding the conventional distinction between inside/outside spaces. The posts connecting the wood joists to the partition walls below stress the detachment of the roof from other parts of the house. The exposed wooden structure of the roof floats over interior volumes while its sloping form echoes the mountains of Malibu. Here Gehry intermingles the image of the American ranch-house, a single free standing object in the midst of land-

scape,¹⁰ with spatial sensibilities derived from modern architecture. The expressive quality of the roof in the Davis Studio is in part a regional element utilised previously in non-residential buildings such as the Public Safety Building and Merriweather-Post Pavilion, both built in Columbia, Maryland. In Davis's Studio, however, Gehry uses corrugated galvanised steel and exposed plywood, charging the building with an industrial/vernacular look. The tactile sensibilities experienced in this building, are indeed well situated in the tradition of modern architecture. One is reminded of R.M.Schindler's

Figure 9. Davis Studio and Residence, Malibu, California, 1972, interior view, Courtesy of Gehry Partners, LLP.



DeKeyser House in Hollywood where the living room volume is entirely sheathed in green rolled roofing which projects over the lower floor (Fig. 10). More compelling is Schindler's Armon House in Mt. Washington California, where an expressive roof and exposed wooden structure shelter an otherwise disjunctive plan where three volumes penetrate each other. This work anticipates Gehry's own house. According to Margaret Crawford:

Like Schindler, Gehry tended to develop interior spaces independently from exterior façades. Directly antithetical to the modernist insistence on the legibility of the interior on the exterior, this produced interesting slippages that Schindler exploited to create complex spaces and Gehry to produce complex exterior forms. Paradoxically, the influences between Schindler and Gehry are reciprocal; if Schindler made Gehry possible, Gehry's work illuminates Schindler's in new ways. For example, Gehry's far more dramatic use of exposed studs (as in his own house) to reveal the nature of wood frame construction makes it possible to see Schindler's less explicit and more integrated use of exposed studs (as in the living room of the DeKeyser house) in a new light.¹¹

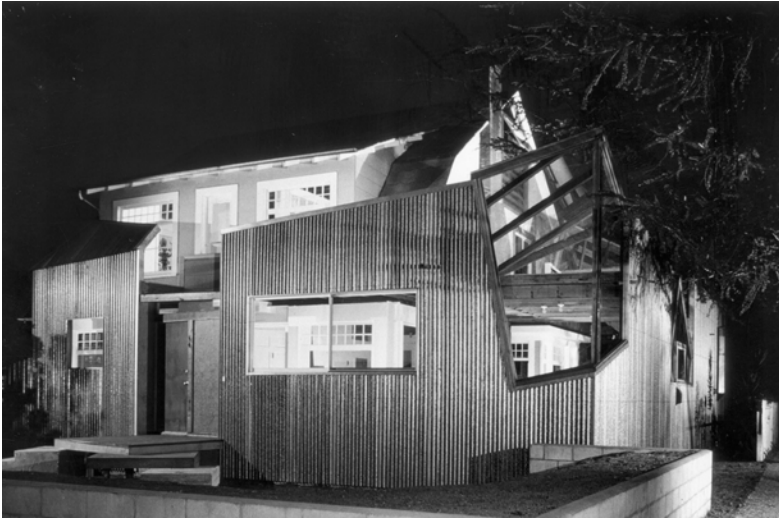
Using inexpensive and ordinary materials such as chain link, corrugated metal, and unfinished plywood, Gehry's own house brings together two design themes essential for his departure from regionalism (Fig. 11).¹² In several interviews Gehry has expressed his fascination with the unfinished quality of a painting, sculpture, and even buildings under construction: 'I was interested in the unfinished – or the quality that you find in paintings by



Figure 10. R. M. Schindler, DeKeyser House, Los Angeles, California, from *International Architecture Review*, 2G, 1997.

Jackson Pollock, for instance, or de Kooning, or Cezanne, that look like the paint was just applied . . . We all like buildings in construction better than we do finished – I think most of us agree on that.¹³ The fact that contemporary painting can mediate with the outside world through use of paint and even sometimes by use of plain metal and wood evokes primitive tactility rooted in vernacular arts. In Gehry's house, the juxtaposition of the unfinished wood studs with highly articulated white clad surfaces, however, could be associated with the aesthetic sensibilities of the idea of both/and discussed by Robert Venturi.¹⁴ Nevertheless, in Gehry's hands, the thematic dualities such as inside/outside or old/new do not end in either/or resolutions. His own house marks a departure from what I would like to call architecture's interiority¹⁵ for a way of thinking in which architecture is

Figure 11. Gehry's Residence, Santa Monica, California, 1994, exterior view, Courtesy of Gehry Partners, LLP.



perceived as 'modelling.' I owe this last word to Giovanni Leoni who, comparing Aldo Rossi with Gehry, suggests that Rossi perceived architecture as analogous to stage construction, and concludes that 'the anti-architectural force of Gehry's architecture, which is perhaps what makes it appeal so much to the general public, can on the contrary be called modelling.' According to him, Gehry's buildings 'seem to be architectures which live in complete serenity within world of the form, and with their procession of dancing objects, . . .'¹⁶ I will problematise Leoni's view shortly, but first I

want to introduce the idea of formal playfulness as another theme important for Gehry's departure from regionalism.

By guiding design with few programmatic and perhaps site specific considerations, Gehry's design enters into an open-ended formal inquiry similar to that of scientific research. 'I guess,' Gehry says, 'I approach architecture somewhat scientifically – there are going to be breakthroughs, and they're going to create new information. It's adding information to the pot – not necessarily regurgitating other, older ideas.'¹⁷ Gehry's interest in

spontaneity of design process distills his architecture from metaphysical considerations as well as those themes indulged with the pleasure of the body in space pursued by Peter Eisenman and Bernard Tschumi. Also undetected in Gehry's architecture is the duality between construction and appearance, a crucial theme for the tectonic. Considering his interest in the 'unfinished,' however, I would like to suggest that Gehry's design paradigm is rather similar to that of an artist; no one except the painter, for instance, knows why his/her painting is called finished at a particular moment.

The formal implications of a design informed by the aesthetic of unfinished and spontaneous playfulness is best demonstrated in the Winton Guest House built in Wayzata, Minnesota 1982–1987 (Fig. 12). This house embodies some architectonic elements from both the past and what would become formative for Gehry's future architecture. The Winton House employs the idea of montage and theatricalisation of architecture simultaneously: each room is perceived and shaped based on programmatic needs and is clad with different materials without addressing

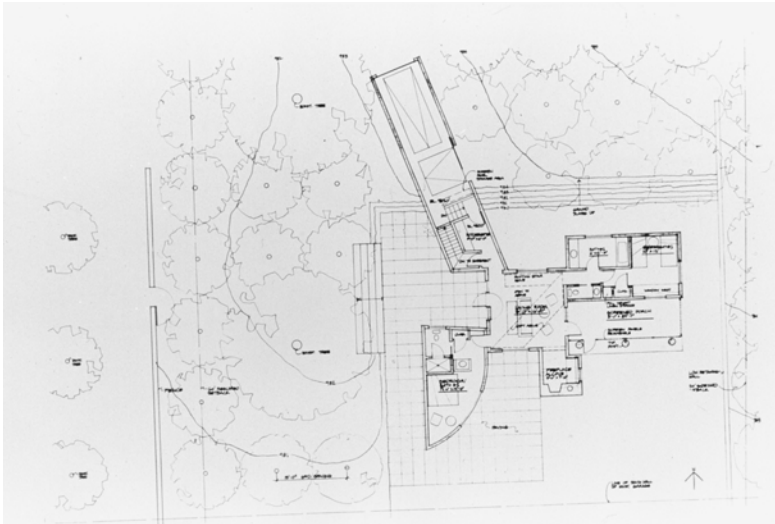


Figure 12. Winton Guest House, Wayzata, Minnesota, 1987, plan, Courtesy of Gehry Partners, LLP.

any particular narrative (Fig. 13). One bedroom is clad with local kasota stone while the other is sheathed in painted metal panels. These boxed volumes are playfully arranged around a core (the living room) built next to a house designed by Philip Johnson in 1952. Such a theatrical composition, however, dismisses the serenity of regional sensibilities, in particular the roof. The design also lacks the kind of animation permeating his recent projects. The Winton House is, indeed, an extension of ideas already at work in the California Aerospace Museum where dream-like images collide with each other to express their formal

autonomy (Fig. 14). Also noticeable in these two buildings is the central void whose presence is stressed by a vertical volume rising above other elements. The living room (the void) of the Winton House, is shaped by surrounding volumes and a truncated cone at the top. With metallic flesh and the void within, the truncated cone of the Winton House can be associated with the stand-up figure of a fish. If my last point seems peppered by subjectivism, the fact remains that the architectonic of a truncated cone compromises the line separating the roof from the wall.

Figure 13. Winton Guest House, Wayzata, Minnesota, 1987, model, Courtesy of Gehry Partners, LLP.



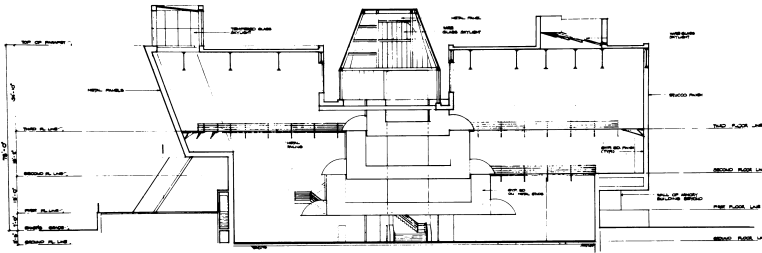


Figure 14. California Aerospace Museum, Los Angeles, California, 1984, section drawing, Courtesy of Gehry Partners, LLP.

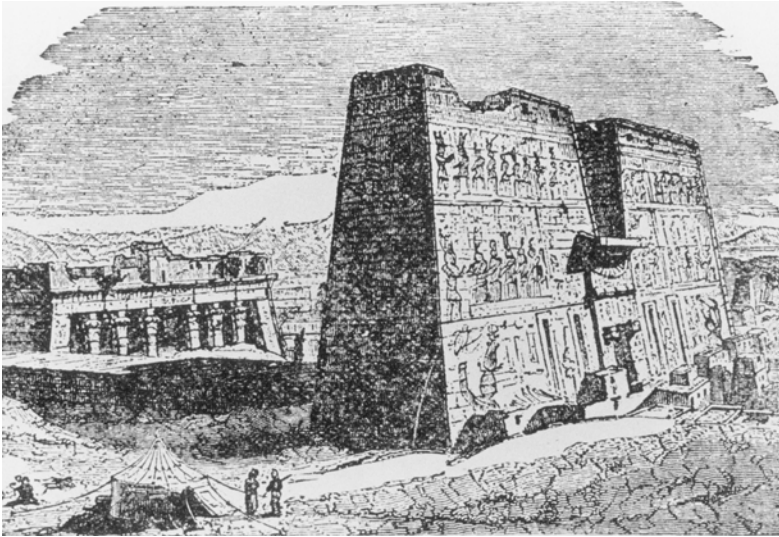
The implied pyramidal form of the living room at the Winton House is a reminder of the ancient Egyptian temples which according to Gottfried Semper 'rose chiefly from that element we have called the enclosure, ... The other element, the roof, manifests itself in a twofold way: at times symbolically in the *sekos* as a pyramidal headpiece . . . , and second, as the flat cover over the courtyard. There it ceased to appear from the outside, but inside, as an unfurled sail, it fell into the province of the wall filter, the motive to which it originally belonged.'¹⁸ For Semper the element of roof and its support evolve out of a conscious tectonic response to the essential act of walling (Fig. 15). My reference to Semper and the tectonic rapport between the roof and the enclosure does not put limitations on formal creativity. I want, rather, to underline the importance of the image of fish in Gehry's work and the way such an image induces a world of pure figurative forms that problematise the tectonic rapport between the enclosure and the roof. Obviously, a certain kind of 'image' occupies a particular place in the architect's

mind, to the point that, like a craftsman, he/she attempts to correspond to the final form of design with that particular image. What is important, however, is the way one recodes an image to probe issues internal to architecture as well as those forces framing architecture within a material and aesthetic network of a given production and consumption system.¹⁹ My discussion here is not concerned with the atectonic architecture of Gehry, but his resilience to think of an architecture that in some ways would sustain a critical position palpable to the drive of commodification and its aesthetic connotation for architecture.²⁰ In raising this point, however, I am aware of the difficult interpretation I am ascribing to Gehry's work or that of any contemporary architect: How would one practice a critical architecture in a situation when production and consumption of images have become essential for the culture?

Technique of Spectacle

Giovanni Leoni is right to remind us of the anguish caused by combining 'aura and market'.

Figure 15. Egyptian Temple, from Harry F. Malgrave, *Gottfried Semper*, Yale University Press, 1996.



Nevertheless, he is wrong to conclude that architecture survives in Gehry's work through 'new expressionism.'²¹ Architecture has been thriving under the pressure of commercialisation of landscape since the 1960s, at least in ways more tangible in America. The anguish was first theorised by Robert Venturi and Denise Scott Brown in the language of 'complexity and contradiction' and then domesticised in their lessons drawn from Las Vegas.²² Should one see architecture's survival in the expressive language of telecommunication

technology, as does Leoni, then one stops short of learning the lessons from the experiences of the 1960s, as well as being unable to differentiate the theatricalisation that is taking over current architecture from the expressionism of the 1920s.²³ In search of the lost spirit of the war years, expressionism envisioned fantastic forms that 'would suspend the forces of gravity and overcome the obstinate solidity of matter . . .'.²⁴ If the utopia of glass architecture was the representational mode proper to a class of disenchanting modernists, then

one could say that irony and rhetoric are tools by which post modernists disguise the entering of architecture into the realm of the 'culture industry.' Is it history's irony that one can today witness how expressionism (a familiar language, though of a high-culture origin) smoothes the passage of architecture towards the aesthetic of commodity fetishism? Francesco Dal Co makes a similar assessment by suggesting that, by updating techniques used by the historical avant-gardes, Gehry makes 'significant innovations in professional and design practice, because this programme can be realised only when the constructed work is assigned the task of establishing a relationship not to a public of users, but with an audience of spectators. In this way architecture tends to mutate, to change its nature, eschewing usage and becoming entertainment.'²⁵ This ironic turn in design practice, indeed, speaks for the popularity of Gehry's architecture. It also discloses the fact that the dancing body of his architecture reconciles the biomorphics implied in the image of fish with animation internal to electronic technologies.

The impact of technology on architecture is not new and there is no intention of examining the issues in this paper.²⁶ What I want to stress briefly, though, is the way technification of architecture (to use a term coined by Theodor Adorno) empties the tectonic of any import for architecture. Using techniques developed outside of architecture's interiority reduces architecture to an appendage of technique.²⁷ Discussing the technification of music, Adorno casts light upon Gehry and other architects who use computer techniques not just as a means but as a force to shape the end itself. According

to Adorno, 'extra musical technique is no longer present to act as a corrective but becomes instead the exclusive authority. The whole official music culture is moving in the direction of fetishising of means, and it is even celebrating a triumph among its enemies in the avant-garde.'²⁸

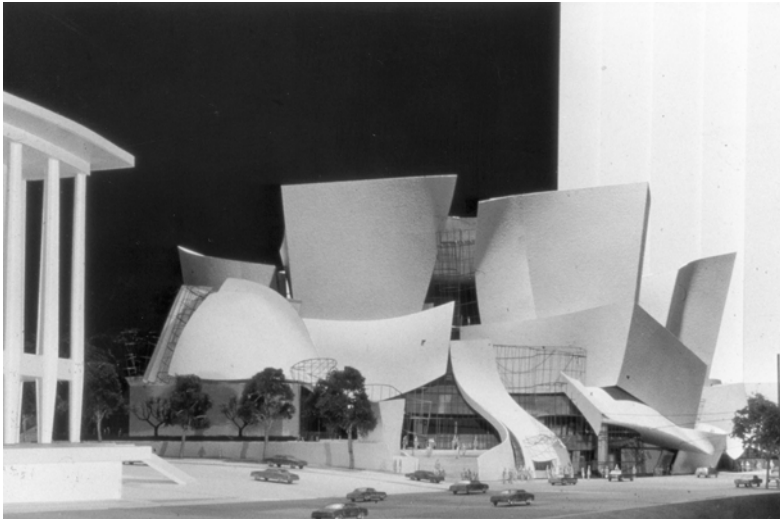
There are two reasons for introducing the subject of technification of architecture here. First, there is the short span of the subject's history, that is, the unpalpability of the classical notion of *techné* for any discussion of architecture since the introduction of industrial techniques and its impact on architecture, and the position maintained by historians and architects since then. Briefly and at the risk of dismissing many significant details, I would like to suggest that major contemporary architectural discourses, in one way or another, are framed by the multiple consequences that modernisation has forced on architecture.²⁹

More interesting, is the issue of architecture's interiority and its resistance to commodification, a process that uproots architectural production and reception from its craft-based domain, subjecting the building to the laws of the capitalist market economy. The second reason for examining the technification of architecture here has to do with the changing sociopolitical nature of the technification of architecture for contemporary avant-gardes. If the historical avant-gardes embraced technology in order to construct an utopian enclave whose cultural matrix remained 'high art' and inaccessible to the masses, the fusion of electronic technologies within everyday cultural production and consumption has adorned reification – induced by the project of modernity – with a mysticism shared by everybody.

To the embarrassment of Peter Eisenman, you do not have to know the philosophical implications of the 'weak form' in order to appropriate his or Gehry's architecture anymore. It is enough to watch pop culture in MTV or Hollywood's latest films and get tuned with the morphic temperament of deconstructivist architecture. 'Hey,' an excited Venturi exclaims, 'what's for now is a generic architecture whose technology is electronic and whose aesthetic is iconographic – and it all works together to create decorated shelter – or the electronic shed.'³⁰ This populist view suggests that the

distance once felt facing the abstract aesthetic of early modern art and architecture is neutralised in part by computer-generated images which have been infused into every aspect of the life-world. Again it should be stressed that Semper's idea of dressing and his concept of theatricality differ from the phantasmagoria of the post-modern world. For Semper, the dressing of the core-form, even when negating the material basis of building, comes to life out of a rapport between the roof and the enclosure, or the earth-work and the frame-work. In this line of thinking, I am also reminded of

Figure 16. Walt Disney Concert Hall, Los Angeles, California, project model, photograph, Joshua White, Courtesy of Gehry Partners, LLP.



Semper's emphasis on theatricality, on the afterlife of an event. According to him, 'The monuments were scaffolding intended to bring together,' not only various cultural artifacts, but 'the crowds of people, the priest, and the processions.'³¹ The challenge to maintaining such a position today has to do with the fact that spectacle, discussed by Guy Debord, has overtaken the collective space.

Wrapping

In the context of the above theoretical considerations and with some exceptions taken into account, one can suggest that, since the Winton House, Gehry's architecture has moved further away from the form-giving potentialities of construction to the point where the element of clothing has emerged as the formative means for his most recent work. This development is forcefully expressed in Gehry's

Walt Disney Concert Hall project where icons of mass culture and music are brought together to orchestrate the theatricalisation of architecture (Fig. 16). The Disney Concert Hall, in evolution since 1989, is an important work that needs to be experienced in order to complete the evolutionary chain leading to the Bilbao building, if not for any other particular reason. The project marks a definitive departure in Gehry's design: it resolves the conflict between the montage of fragmented forms and an expressive clothing whose many layers come together to emphasise the vertical void in the middle. In the Vitra Museum, completed in 1989 (Fig. 17), one already witnessed the presence of undulating surfaces intermingled with fragmented volumes, anticipating the formativeness of the element of wrapping in the Disney project. At Vitra, the element of roof, mostly covered by titanzink,

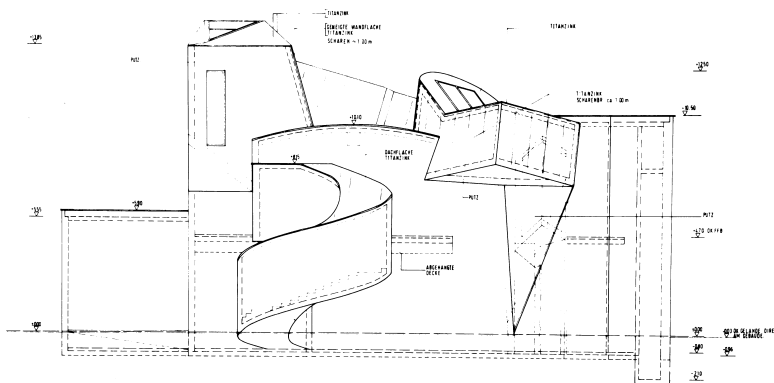


Figure 17. Vitra International Design Museum, Weil am Rhein, Germany, 1989, south elevation drawing, Courtesy of Gehry Partners, LLP.

Figure 18. Fishdance Restaurant, Kobe, Japan, Courtesy of Gehry Partners, LLP.

is presented as another enclosure wrapping a cluster of fragmented volumes. Only by experiencing inside space can one experience the presence of the roof; a situation comparable to Semper's observation about ancient Egyptian temples. Meanwhile, during the years separating the Winton House from the Disney project, the metaphor of fish kept occupying a visible place in Gehry's oeuvre. Besides being the subject of several artistic installations erected between 1983 and 1986, the metaphor of fish departs from the two-dimensional realm of Gehry's drawing board and attains major architectonic form first in the Fishdance Restaurant built in 1987 (Fig. 18), and more forcefully later in the Vila Olimpia built in Spain (1992). In this last project, a 160 feet long and 100 feet tall fish obtains its visibility and landmark position by hovering above a complex of commercial buildings (Fig. 19).

Gehry's design for the Disney Concert Hall skews the post-modern fascination with historical images and the architecture of spectacle. By doing so, he strikes a parasitical note in tectonic thinking. The Concert Hall project is fashionably dressed up to designate a volumetric mass that denies any coherent and hierarchical order, and yet relates the building to its site heterogeneously. Seen from Hope Street, the main body of the central hall sits on a horizontal volume that houses the servant spaces. This *parti*, if you wish, was also used in the Jung Institute for Los Angeles in 1976. The sketches of this unbuilt project depict an L-shaped rectangular box whose roof is invaded by a number of playful and independent volumes (Fig. 20). According to Kurt Forster, Gehry was 'obviously



discovering something important at this stage, when he relaxed, and even severed, the links that had hitherto locked the various parts of a building into a single whole.'³² This observation is in tandem with Gehry's approach in the Familian Residence and his own house. In the Jung Institute and the Disney Concert Hall, instead, one witnesses a disintegrated whole that is not achieved through fragmentation but by a compositional distinction between what is necessity and what is excessive.

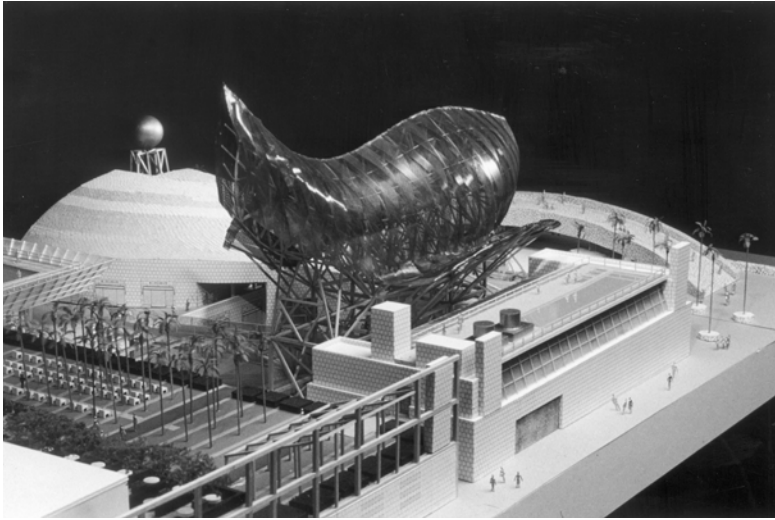
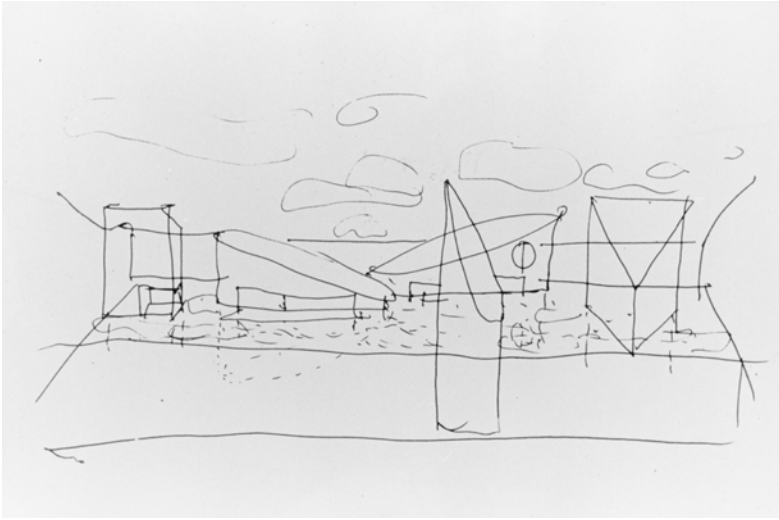


Figure 19. Vila Olímpica, Barcelona, Spain, 1992, Courtesy of Gehry Partners, LLP.

In the Disney project, the rational articulation of the base stands in contrast to the vertical and dynamic configuration of the central volume. The podium in these two projects holds up a vibrant form evoking the relationship of a dancer to the stage. The seam connecting the building to the ground in the main façade, on the other hand, is treated more in line with the dressing of the concert hall. Here, the fragmented and twisted surfaces are dramatised by cuts that mark the main entrance. This gestural figuration is stressed by rotating the plan of the amphitheatre against the

main axis of the site (Fig. 21). Such an inflection projects the figure of the main volume forward and up, as floors stack on each other. Seen from the angle of the main entrance (Fig. 16), the vertical cut through the enclosure makes room for a glazed volume to jut out disclosing the central void. Through the same opening one can see the structural columns whose form indicates a distinction between what is dressing and what is constructional. Each column has a short tree-trunk base from which structural, vertical elements are stretched out to support the enclosure. The cuts

Figure 20. Jung Institute, project, Los Angeles, 1976, Courtesy of Gehry Partners, LLP.



on the body of the amphitheatre emulate the idea of 'ruin in future,' a visual sensibility fashionable in the 'grungy' clothes of the urban youths around the 1980s. However, it is Gehry who utilises the space between the metal wrapping and the 'shoebox' amphitheatre with terraces, gardens, and other programmatic requirements; an arrangement that saves the project from being a mere post modernist 'decorated shed.'

The metaphoric analogy between dress and the vertical configuration of the central volume in the Disney Concert Hall recalls the posture of a dancer.

There is an intriguing dialogue between the disintegrated seam in the front part of this building and the soaring volume of the concert hall. Somewhat similar to a ballet dancer, the vertical volume appears to defy the forces of gravity. This 'theatrical posture' does not, however, simulate total weightlessness. The building's figure evokes the posture of a dancer who after soaring up and twisting around eventually stands firm and maintains minimum contact with the ground. The fragmented and torn surfaces of the amphitheatre could also be associated with fabrics used to cover scaffolds

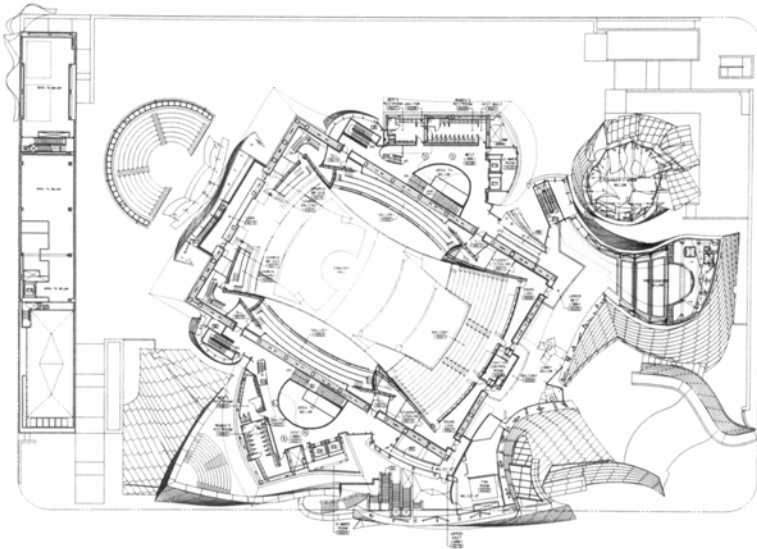


Figure 21. Walt Disney Concert Hall, Los Angeles, California, plan, Courtesy of Gehry Partners, LLP.

in carnivals, and of course, tent architecture. This analogy is important not because of the twist one might give to the debate on the origins of architecture, but because of the importance of textiles for architecture (whether implied in Semper's idea of dressing or derived from the architecture of the tent) and the concept of fabrication as a way of seeing and making that is implied in the word fabric. The art-form of the Disney Concert Hall suggests that the perceived spatial envelope is

literally a fabrication; the etymology of which signifies both the style or plan of construction and woven material. Reminding us of that ambiguous moment of intersection between gravity and the unconscious, particular to the animated world of cartoons, Michael Sorkin observes that, 'the Disney project is also a distortion, a cartoon that inflates the unseen ideal form: those shapes in the Disney hall are both dancing flowers or hippos but also dancing not-cubes and not-rectangles, distorted

away from the familiar but not so far as to cease affinity.³³ The implied defamiliarisation in Sorkin's statement discloses a formalistic approach to architecture. To free the enclosure from any constraint, including the geometry induced by structural logic, which results in the absolute autonomy of form.

Although the discrepancy between the art-form and the structural logic is endemic to the tectonic,³⁴ nevertheless, Gehry does not address this gap in an attempt to articulate the rift between the formal (sculptural) and the structural beyond an either/or resolution. One might speculate that Gehry utilises the analogy between fabric and dressing beyond the nineteenth century architectural discourse. One might also suggest that his architecture folds the tectonic thinking back to a state of primitivism when architecture, according to Adolf Loos, was realised by putting up four carpets, and the structural elements were seen as auxiliary; they just supported the carpets.³⁵ Was not the idea of the Dom-ino frame (and its consequences for the free façade and the free plan) in part motivated by tent architecture whose regulating lines still refer to the importance of cubes and rectangles, even seen through the distorted lens of post modernity? By investing in 'fabrication' and demystifying the classical discourse on construction, Gehry's design entertains an early modernist vision in which a primitive sense of freedom was sought as a scapegoat against the constraints modernisation had forced on architecture. 'Actualisation' of past through the present (what Walter Benjamin coined as allegory) reaches a critical dimension in Gehry's appropriation of the aesthetic of fabrication. The

aesthetic appeal of the wrapping surfaces of the Disney project is a reminder of the 'mystical' character of commodities whose fetishism speaks of the dissociation of the commodity from its use-value.³⁶

The theatrical character of Gehry's design, its allusions to the posture of the dancer and the expressive falseness of its dressing, is suggestive of an architecture of spectacle. As a metaphor, 'spectacle,' in this particular case, stands for the programmatic and iconic connotation of the Disney Concert Hall. In Kahn's words, Gehry's building wants to be the architecture of event that has no referral and yet by bringing together the spectacle (the stage) and the spectator, the building itself becomes part of the culture of spectacle. The idea is given a new pitch in the Bilbao Guggenheim Museum in Spain (Fig. 22). This building is, indeed, Gehry's ultimate statement in defying Semper's theory of dressing, i.e., *Bekleidung*, and favouring the aesthetic of dressed-up.³⁷ While the former is achieved by the embellishment of a constructed form and its poetic expression in the surface, the dressed-up, instead, suggests a vision of wrapping that is implied in the formal and aesthetic freedom embedded in the frame-structure at work since the inception of the Dom-ino frame. The Bilbao building also recollects two themes important for Gehry's work; first the image of fish, which in this particular project attains a contextual quality, partly due to its watery site, and second, the sculptor's vision of his/her object at hand.

Rosemarie Haag Bletter reminded us, as early as 1986, of the importance of the idea of constant change invested in Kurt Schwitters's *Merzbau* (built

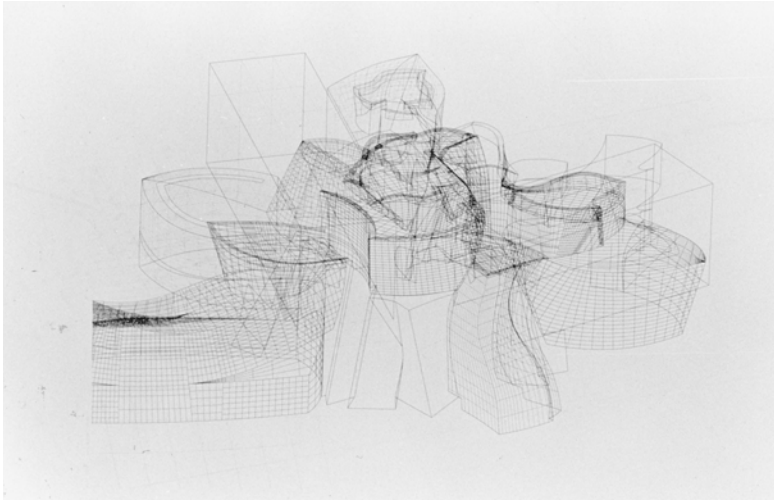


Figure 22. Guggenheim Bilbao, three-dimensional rendering of steel structure, Courtesy of Gehry Partners, LLP.

in 1933) and Gehry's house in Santa Monica: 'Schwitters's sculpture gradually grew from inside out to absorb the old house,' Bletter observes, whereas Gehry, 'works from the outside in by entrapping the original bungalow of his Santa Monica house within a new shell.'³⁸ More recently, Dal Co has picked up the Merzbau to discuss the Bilbao building.³⁹ What is intriguing in the Merzbau, however, is the endless transformation of the project to the point that the work denies any possible representational dialogue between material, construction and representation. According to Dal Co, the 'operative' tech-

nique utilised by Schwitters 'makes its constituent elements imperceptible: the only presence it permits is the continuously evoked presence of its artifice.'⁴⁰ This artistic technique is used in the Guggenheim's titanium dressing whose overall enclosure reveals no trace of the steel frame beneath (Fig. 23).

To underline my concern for the rapport between a constructed form and its clothing, I would like to draw attention to Claes Oldenburg, an artist associated with Gehry's interests. In Oldenburg's entry for the Chicago Tribune Tower Competition of 1968, a skyscraper is envisioned in the form

empty of imagination. I rather want to stress a problem inherent to the interiority of architecture: since the experience of the Dom-ino frame,⁴² the frame-structure provided the opportunity for the architect to avoid the tectonic dialogue between structure and the element of wrapping. The pictures taken during the construction of the Bilbao building suggest that the steel framework was entertained primarily as supportive mechanism to hold up a preconceived shell. The expressive freedom apparent in the clothing of Gehry's recent building recalls Gilles Deleuze's association between the idea of 'fold' and Baroque architecture.⁴³ And yet long before Deleuze's text became a textbook for deconstructivist architecture, Hans Sedlmayr had recognised the 'artistic structure' of Borromini's San Carlo in undulating walls repeating four times in the plan. Here, 'structure is found paradoxically in a surface element without structural function.'⁴⁴

I would like to suggest that, independent of structure the element of wrapping has become the form giving impulse in the Bilbao building. Gone in Gehry's vision is the Miesian tectonic that is revealed in the dialogical relationship between column and wall, and the earth-work and the frame-work. Gehry also dispenses with Kahn's attempt to reveal the way a space is conceived and constructed. Instead, Gehry says, 'I have been interested in expressing feelings in my work, that means you don't distil them with rationalisation. You solve the practical stuff but don't take the juice out while you are doing it.' The 'juice' perhaps refers to the protein of formal voyeurism rested in computer-generated images which Gehry appropriates so skilfully.

Notes and references

1. This article was written as part of a manuscript focusing on contemporary architecture. I would like to thank Allen Cunningham for his constructive editorial comments. My special thanks to Keith Mendenhall from Frank Gehry's office who provided the illustrations.
2. Frank Gehry has always worked with artists: 'I have been very involved with their work; I think a lot of my ideas have grown out of it, and that there's been some give and take.' From an interview with Peter Arnell in P. Arnell and Ted Bickfor (eds), *Frank Gehry: Buildings and Projects*, (New York, Rizzoli Publications Inc., 1985). Gehry's collaboration with Richard Serra is special; Gehry noticed the expressive potentialities of the fish while designing with Serra a bridge for Manhattan. Germano Celant sees some similarities between Gehry's work and Claes Oldenberg. According to him, 'Gehry like Oldenberg takes advantage of the Surrealist idea of the ready-made. The position that Gehry and Oldenberg seem to share must be examined by studying the relation to the contextual determinations that the object-icon has as it interacts with its context in reality. . . . This is how the meaning of Oldenberg's Bat Column and Flashlight may be understood in their dialogue with, respectively, Chicago and Las Vegas; the meaning of Gehry's fish may be deduced from its functioning with respect to the aquatic element that surrounds Manhattan.' G. Celant, 'Reflections on Frank Gehry,' in P. Arnell and T. Bickford, *op.cit.*
3. Francesco Dal Co, 'The World Turned Upside-Down: The Tortoise Flies and Hares Threaten the Lion,' in Kurt W. Forester and Francesco Dal Co, (eds), *Frank O. Gehry*, (New York, Monacelli Press, 1998), p. 42.
4. According to Thomas Hines, Frank Gehry's obsession with fish was stimulated by his grandmother. Gehry recalls, 'Every Thursday through much of his

childhood he would go to the Jewish market, we'd buy a live carp, we'd take it home . . . we'd put it in the bathtub and I would play with this . . . fish for a day . . . until she killed it and made gefilte fish.' Recalling the anti-Semitism prevailing during Gehry's youth, the architect was given the ironic nickname of 'Fish' by 'his tormentors, presumably to suggest bad odour, and he would not realise until much later that "fish" was a Christian symbol. His ambivalent identity with the image, however, would last until exorcised in his fish sculptures of the 1980s.' Hines, 'Heavy Metal: The Education of F. O. G.,' in *The Architecture of Frank Gehry* (New York, Rizzoli International Publications Inc., 1986), pp. 11–24, and pp. 13–14.

5. Gilles Deleuze & Felix Guattari, 'The Smooth and the Striated,' *A Thousand Plateaus* (Minneapolis, University of Minnesota, 1987), pp. 474–500.
6. See Francesco Dal Co, Kurt W. Forster, *Frank O. Gehry: Complete Works* (New York, the Monacelli Press, 1998).
7. On the subject of theatricality see my 'Theatricality: Dancing Architecture,' in *Formulation Fabrication: The Architecture of History* (Wellington, NZ Print Ltd, 2000), pp. 31–38.
8. Here I am alluding to the term phantasmagoria as discussed by Walter Benjamin. Borrowing Karl Marx's articulation of the deceptive appearance of commodities (fetishism of commodities), Benjamin underlined the optical illusions stimulated by the spectacular look of Paris. According to Susan Buck-Morss, Benjamin's point of departure 'was a historical experience rather than an economic analysis of capital, the key to the new urban phantasmagoria was not so much the commodity-in-the-market as the commodity-on-display, where exchange value no less than use value lost practical meaning, and purely representational value came to the fore.' Buck-Morss, *The Dialectics of Seeing: Walter Benjamin and the Arcade Project* (Cambridge, The MIT Press, 1989), pp. 81–82. After the Crystal Palace, it is reasonable to speculate that museums today have inherited the visual allure of the world exhibitions built around the 1850s. In the context of nineteenth century cities, the Crystal Palace enjoyed a level of phantasmagoria invested in the commodities displayed inside.
9. See footnote no. 2 above. At another occasion, Frank Gehry has this to say about the importance of the fish in his design: speaking of his participation in Tigerman's call for the Chicago Tribune Competition, Gehry recalls that 'since I was never able to finish the Tribune drawing, I started making the colonnade with the eagle. And then I decided – well I should have more columns. And that's when I drew the fish standing up . . .' Arnell in P. Arnell and Ted Bickford (eds), *Frank Gehry: Buildings and Projects, op.cit.*
10. Germano Celant persuades his readers that 'the O'Neill Hay Barn and the Ron Davis House pay tribute to the architectural tradition of the Indian of the Northwest. . . . The architectural language of the Ron Davis House is linked to the craftsman tradition of tribes living from California to Alaska, who consider the shaping of their environment to be one of the highest artistic expressions.' Rosemarie Haag Bletter considers Gehry's sensibilities in part derived from 'toying with a conflation of the world of perception and conception . . .' See Celant, 'Reflections on Frank Gehry,' in P. Arnell and Ted Bickford (eds), *Frank Gehry: Buildings and Projects, op.cit.*, and Bletter, 'Frank Gehry's Spatial Reconsiderations,' in *The Architecture of Frank Gehry, op. cit.*, p. 26.
11. Margaret Crawford, 'Forgetting and Remembering Schindler: the Social History of an Architectural Reputation,' in 2G no. 7, (1998), pp. 129–142.
12. I will not exhaust Frank Gehry's well-discussed house here. Among others, Frederic Jameson has noticed

the spatial qualities of Gehry's house, suggesting that it marks a departure from modernist understanding of the dialectics between interior and exterior spaces. More interesting to me is Jameson's idea of 'wrapping' versus the modernist tendency for 'grounding': one stresses the figure/ground relation derived from the forces of gravity, the other envisions floating forms comparable to dancing figures in Surrealist art, if not similar to the floating nature of commodities in late capitalism. He describes the 'wrapping' intervention into the old house in the following words. Indeed, 'both the now sunken living room and the dining areas and kitchen opened up between loosely draped external wrapper and the "withering away" of the now seem to me the thing itself, the new postmodern space proper, which our bodies inhabit in malaise or delight, trying to shed the older habits of inside/outside categories and perceptions still longing for the bourgeois privacy of solid walls (enclosures like the old centred bourgeois ego), yet grateful for the novelty of the incorporation of yucca plants and what Barthes would have called Californianity into our newly reconstructed environment.' Jameson, *Postmodernism, or the Cultural Logic of Late Capitalism*, (Durham, Duke University Press, 1991), p. 115. For Jameson, the idea of wrapping is a formative theme for postmodern architecture. My following remarks on the importance of 'clothing' in Gehry's architecture intends to demonstrate both his departure from regionalism and the popularity of his most recent architecture.

13. B. Diamonstein, *American Architecture Now* (New York, Rizzoli Publishing Inc., 1986), p. 36.
14. Robert Venturi, *Complexity and Contradiction in Architecture*, (New York, The Museum of Modern Art, 1966). Criticising what he calls the "tradition of either/or," in orthodox modern architecture, Venturi emphasises contradiction and hierarchy that 'yields several

levels of meanings among elements with varying values. It can include elements that are both good and awkward, big and little, closed and open, continuous and articulated, round and square, structural and spatial.' P. 31.

15. By architecture's interiority I mean tropes accumulated through the history of architectural theories and practice. I am thinking of ideas concerning inside/outside relations, the dialogical rapport between column and wall, the tectonic achieved by symbolic embellishment of a constructed form, or that of the earth-work and the frame-work as discussed by the nineteenth century German architect Gottfried Semper. My discussion of architecture's interiority differs from Peter Eisenman's recent reflection on 'interiority of architecture' arguing for a formalistic understanding of architecture. See Eisenman, *Diagram Diaries* (New York, Universe Publishing, 1999), pp. 27–43.
16. Giovanni Leoni, 'Modeling Versus Building,' in *Area*, no. 41, (1998), pp. 4–5. Interestingly enough the author is well aware of the absence of the tectonic in Frank Gehry's work: 'It is not necessary to quote either Semper or Mies to assert that modeling denies architecture as technique, while construction as assembly denies architecture the possibility to be an individual creative act.'
17. See B. Diamonstein, *American Architecture Now*, *op.cit.*, p. 37.
18. Gottfried Semper, 'The Four Elements of Architecture,' in *The Four Elements of Architecture and Other Writings*, trans. Harry F. Mallgrave and Wolfgang Herrmann (Cambridge, Cambridge Univ. Press, 1989), p. 115.
19. It is important to recall the place of the image of silos or liners for Le Corbusier and that of the hut for Mies van der Rohe. It is equally important to remember how each of them re-articulated

- architecture with reference to earth, sky, and the impact of metropolis on architecture.
20. Kenneth Frampton for one has presented the tectonic essential for a 'critical practice' in postmodern conditions when the 'novum' has lost its validity. 'While the crisis of the neo-avant-garde derives directly from the spontaneous dissolution of the new, critical culture attempts to sustain itself through a dialectical play across a historically determined reality in every sense of the term.' K. Frampton, John Cava (ed.), *Studies in Tectonic Culture* (Cambridge, the MIT Press, 1995), p. 25.
 21. Giovanni Leoni, 'Modeling Versus Building,' *op.cit.*, p. 2.
 22. For a critical reflection on Robert Venturi, Denise Scott Brown see, Kenneth Frampton, 'America 1960–1970: Notes on Urban Images and Theory,' *Casabella*, no. 359–360, XXV, (1971), pp. 24–38. For Denise Scott Brown's response to Frampton's charges see, *ibid.*, pp. 39–46. More recently, Neil Leach has this to say about the architectonic implications of *Learning from Las Vegas*: 'once one enters an argument of "form for form's sake" where form is abstracted from other concerns, it is not easy to "resynthesise" these concerns into the form in the final design. It is this principle of aestheticisation, then, that allows Venturi, Scott Brown, and Izenhour to remain so oblivious to the socio-political questions at the heart of Las Vegas, to anaesthetise it, and to adopt an approach that is epitomised by their celebration of the advertising hoarding.' Leach, *The Anaesthetics of Architecture* (Cambridge, the MIT press, 1999), p. 63.
 23. The same could be said about Kurt W. Forster who makes analogies between the playfulness of Gehry's architecture and that of Francesco Borromini. See Forster 'Architectural Choreography,' in *Frank O. Gehry*, ed. Kurt W. Forster and Francesco Dal Co, *op.cit.*, pp. 9–38. I will discuss the analogy between current esteem for 'expressionism' and that of Baroque at the end of this essay. What is needed to add here is that analogies made between the theatricalisation of current architecture and either the Baroque or the Expressionism of the 1920s surpass modernist historicism, but also stop short of stressing the historicity of current architecture. According to Alan Colquhoun, historical analysis would have to reconcile 'the uniqueness of our culture, which is the product of historical development, ... with the palpable fact that it operates within a historical context and contains within itself its own historical memory.' Colquhoun, 'Three Kinds of Historicism,' *Modernity and the Classical Tradition* (Cambridge, the MIT Press, 1989), p. 16.
 24. Fritz Neumeyer, 'Nexus of the Modern: The New Architecture in Berlin,' in *Berlin 1900–1933: Architecture and Design* (Washington, The Smithsonian Museum, 1987), p. 52.
 25. Francesco Dal Co, *op.cit.*, p. 42. I would like to recall Fredric Jameson's periodisation of art to three modes of 'realism,' 'abstraction,' and the fetishism of commodity production, each marking an aesthetic appropriation of art and architecture proper to a particular stage of modernisation. Also important is Fredric J. Schwartz's discussion of the Bauhaus: following George Simmel's 'Philosophy of Money,' published in 1920, Schwartz underlines the presence of 'spectacle,' articulated by Guy Debord, as an important element smoothing an artifact's way to the realm of consumption. See Schwartz, *The Werkbund: Design Theory and Mass Culture before the First World War* (New Haven, Yale University Press, 1996).
 26. See the first chapter of my *Ontology of Construction*, 1994, where I discuss the historical transformation from *techné* to the tectonic, and the montage of construction in contemporary architecture. Also see the last chapter of *Modernity and its Other*, 1997,

where my reflections on technology and architecture are motivated by Theodor Adorno's discourse on the subject as presented in his *Aesthetic Theory* (London, Routledge & Kegan Paul, 1984).

- 27 The subject has been around since the nineteenth century rationalist approach to architecture and was sterilised later by those who would underestimate the creative and symbolic dimension of architecture. At a theoretical level, Reyner Banham's *Theory and Design in the First machine Age*, published in 1960, and the author's emphasis on Richard Buckminster Fuller, formulate an idea which can be traced back to Hannes Meyer's 'antipathy to composition in architecture,' to use Kenneth Frampton's words, as well as Walter Gropius's prefabricated Törten Housing of 1926, where the final layout and forms were dictated by the technologies of the assembly line. As I will discuss below in the main text, contemporary architecture's infliction by technology has touched the historical vision of authors like Sigfried Giedion and Banham. For collected essays looking at this subject though from a different angle, see Peter Galison and Emily Thompson, (eds), *The Architecture of Science* (Cambridge, The MIT Press, 1999). Frampton's quotation above is cited on page 354. Also see Alan Colquhoun's review of Banham's *Theory and Design in Essays in Architectural Criticism: Modern Architecture and Historical Change* (Cambridge, MIT Press, 1981), pp. 21–25. The original text was published in *British Journal of Aesthetics*, January 1962, pp. 59–65.
28. Theodor Adorno, 'Music and Technique,' in *Sound Figures* (Stanford California, Stanford University Press, 1981), p. 202.
29. I am reminded of Demetri Porphyrios' insistence on the tectonic of stone architecture inherited from the classical tradition, as the sole language to be practised today. Without pushing the envelope to this extreme, Manfredo Tafuri has persuasively launched a relentless critique of Modernity and its implications for architecture, in a way that makes contemporary architecture seem like a by-product of a schizophrenic mind, one that has no choice but to enter the dead-end alley of modernisation as the only escape from modernity itself. Alberto Perez-Gomez projects the crisis of architecture back to the time when the poetic rapport between logos and mythos disappeared. His position can be characterised as a vision of Modernity whose objective and subjective forces have never attained hegemony. See Perez-Gomez, *Architecture and the Crisis of the Modern Science* (Cambridge, The MIT Press, 1983).
30. Robert Venturi, *Iconography and Electronics upon a Generic Architecture: A View From the Drafting Room* (Cambridge, The MIT Press, 1996), p. 11.
31. Gottfried Semper, *The Four Elements*, 1989, *op. cit.*, p. 65. This conception of theatricality is implied in Jean-Jacques Rousseau's description of a non-theatrical public spectatordom: 'But what then will be the objects of these spectacles? What will be shown in them? Nothing if you like. With liberty, wherever abundance reigns, well-being reigns as well. Plant in the middle of a square a pole crowned with flowers, bring the people together there, and you will have a festival. Do better still, make the beholders the spectacle, make them actors themselves; make each of them see himself and love himself in the others so that they will all be more closely united.' Quoted in Michael Fried, *Absorption and Theatricality* (Berkeley, University of California, 1980), p. 221.
32. Kurt W. Forster, 'Architectural Choreography,' in Francesco Dal Co, Kurt Forster (eds), *Frank O. Gehry, op.cit.*, p. 24.
33. Michael Sorkin, 'Frozen Light,' in Mildred Friedman (ed.), *Gehry Talks: Architecture + Process*, (New York, Rizzoli International Publications Inc., 1999), p. 31.

- Sorkin's observation also brings to light a particular aspect of film making that is important to Frank Gehry's work. According to Sorkin, 'both cartoons and films evolved out of a process of bringing single frozen cuts or images together by animation'. In this process, however, there is no limit to such distortion so far as familiar objects and images are not totally washed out. 'While Mickey resembles a mouse but looks like no mouse we've ever seen, nevertheless, the cartoon holds its familiarity to our eye as long as Mickey plummets to earth when being conscious of walking in air.' *Ibid.*
34. This subject is convincingly discussed in Hubert Damisch's structuralist reading of Viollet le Duc. See Damisch 'The Space Between: A Structuralist Approach to the Dictionary,' *Architectural Design Profile*, no. 3-4 (1980), pp. 84-89. Discussing Jorn Utzon's Sydney Opera House, Kenneth Frampton also reminds us of two historical occasions when the gap between structural logic and architectonic form comes to closure. 'The first of these occurs during the high Gothic period, while the second arises in the second half of the nineteenth century with the perfection of ferro-vitreous construction.' Frampton, *Studies in Tectonic Culture* (Cambridge, MIT Press, 1995), p. 273.
 35. Of course Adolf Loos was aware that this was not the case with architecture. He used the idea of carpet as a means of stressing his idea of cladding and the architect's intelligent choice of particular material and cladding to generate specific spatial effects. Loos, 'The Principle of Cladding,' *Spoken into the Void* (Cambridge, The MIT Press, 1982), pp. 66-69.
 36. I am alluding to the idea of commodity fetishism and the possibility of relating the architecture of the spectacular to fetish, that is 'an object endowed with a special force or independent life.' See Hall Foster, 'The Art of Fetishism: Notes on Dutch Still Life,' in *Fetish*, *The Princeton Architectural Journal*, vol. 4 (1992).
 37. I have discussed Gottfried Semper's theory of *Bekleidung* and Adolf Loos's idea of dressing in my *Ontology of Construction* (Cambridge, Cambridge University Press, 1994), pp. 20-25, and the chapter on Loos. Also see my *Modernity and its Other* (College Station, Texas A & M University Press, 1997), p. 178.
 38. Rosemarie Haag Bletter, 'Frank Gehry's Spatial Reconstruction', in *The Architecture of Frank Gehry, op.cit.*, pp. 25-63, p. 47.
 39. Francesco Dal Co, 'The World Turned Upside-Down: The Tortoise Flies and the Hare Threatens the Lion,' in Dal Co, K. Forster (eds) *Frank O. Gehry, op. cit.*, pp. 39-61.
 40. *Ibid.*, p. 40.
 41. Françoise Fromonot, *Jon Utzon: The Sydney Opera House* (California, Gingko Press, 1998), p. 167. According to the author, to articulate the fan-shape glass walls, Utzon drew analogies from the wings of a seagull in flight.
 42. On this subject see Gevork Hartoonian, 'The Limelight of the House-Machine,' *The Journal of Architecture*, vol. 6 (Spring 2001), pp. 53-79.
 43. Gilles Deleuze, *The Fold: Leibniz and the Baroque* (Minnesota, University of Minnesota, 1993). According to Deleuze 'Baroque architecture can be defined by this severing of the façade from the inside, of the interior from the exterior, and the autonomy of the exterior, but in such a condition that each of the two terms thrusts the other forward.' (P. 28). The severing of the façade from the interior in Baroque architecture speaks for the independence of the element of wrapping from structure. This of course marked a departure from classical language of architecture where there is one-to-one correspondence between the façade and the plan and organisation of the interior space. On this last subject see Gevork Hartoonian, *Ontology of Construction* (Cambridge, Cambridge University Press, 1994), p. 12.

44. Christopher S. Wood, *The Vienna School Reader* (New York, Zone Books, 2000), p. 32. According to Wood, 'the deliberate, paradoxical reversal of the structure-surface hierarchy characteristic of baroque or rococo architecture became in effect the fundamental manoeuvre of *Struktur-analyse*.' p. 33. One

could follow Hans Sedlmayer's '*Struktur-analyse*' to discuss the dialogical relationship between the roof and the enclosure as the 'structure'; a design principle informing not only Gehry's work but the recent neo-avant-garde's architecture as well.

Part 2

Architecture and the discourses of science

Each one of the countless scientific metaphors in C20th architecture is a little experiment, an attempt to find a relationship between architecture and one or another branch of science, but they all rely on our belief that really ... architectural practice is not scientific.¹

This section collects three texts concerned with the relationship between the two disciplines in terms of concepts of space, self-organising systems, and parallel nineteenth-century debates in biology and architecture about the morphology of form. The latter two were published in an issue of the journal edited by Harry Urbach (JoA v3 n3 1998) which stands out for the analytical depth and fluency of its American contributors.

Reinhold Martin in *Complexities* discursively investigates the interface between contemporary pre-occupations in architecture ('a scientifically inflected notion of "complexity" is simply "in the air" in regions and pockets of architectural discourse'), and explores parallel post-war ambiguities concerning the two disciplines, mutual (or not) efficacy. These were carried into the debate surrounding cybernetics (and its consequences for architecture). Given the volatility of architectural fashion, yet the persistent conceptual residues retained in architectural thought, Martin's discussion is pertinent to the aspirations of the current avant-garde.

Paula Young Lee's thorough historical study *The meaning of molluscs*, a detailed examination of the tangled relationship between biology and architectural theory in nineteenth-century France, is intriguing for the unsuspected ways it turns out that one is discovered within the institution, or constitution, of the other. The mollusc provides a means to question the Beaux-Arts curriculum in more ways than one (familiar though we are with its contemporary built-form).

Published a year earlier, Richard Difford's *Proun* takes a more directly consequential 'architectural' slant, in testing out how the spatiality of Lissitzky's composition, parallels developments in non-Euclidean geometry and rhetoric concerning four-dimensional space. His study culminates in an original analysis of how Lissitzky, in his Proun rooms, maintains the illusion of this other dimension.

All three authors' studies suggest that the interactions between architecture and science are more complex than the practice of a 'scientific' or 'high-tech' architecture.

1 Adrian Forty, *Words and Buildings* (Thames and Hudson, London 2000).

Proun: an exercise in the illusion of four-dimensional space

Richard J. Difford

This paper focuses on the Russian painter and architect Lazar Markovich Lissitzky, and investigates the frequently debated geometrical content of his work. In the course of this investigation I have considered a number of sources drawn from the wealth of theoretical treatises written by artists, philosophers and mathematicians on the subject of the fourth dimension. It is my contention that these texts, when considered in relation to Lissitzky's *Proun* work, define his artistic endeavours as an attempt to find an architectural expression for the reconfigured notions of space that this geometry inspired. At the centre of this discussion is an essay, *A. and Pangeometry* published by Lissitzky in 1925. In this text Lissitzky describes his objective to create a new impression of space.

My discourse begins almost a century before the publication of *A. and Pangeometry*, not with architecture or painting but with the curiosities of popular science.¹ In particular, the suggestion born out of nineteenth century analytic geometry that space might possess a further, hitherto unnoticed dimension.² Unlike the later temporal dimension of Einstein's relativity, a fourth spatial dimension was propounded by some to exist adjacent to our own three-dimensional space, as if as an extension to its boundaries.³ Were such a space to exist (unlikely as that may seem), it would not require that we encounter extreme speed or exceptional mass in order to experience its visual effect.⁴ Believing in its existence, many theorists therefore assumed that our existing perceptual capabilities could be developed to include four-dimensional experience, while for the visionary artists of the early twentieth century, imagining the nature of this experience provided a wealth of new visual material and an aesthetic for a technological future founded in

a contemporary mathematical theory.⁵

Despite the many erroneous and extravagant theories to which the suggestion of a fourth dimension gave rise, the opportunity that made investigations into four-dimensional space possible appears to have been little more than a chance feature of mathematics. The fact is that although our usual understanding of space in three dimensions completely fills our experience of volume, there is apparently no reason why we might not describe mathematically a fourth direction on an axis perpendicular to each of the other three.⁶ The argument goes something like this:

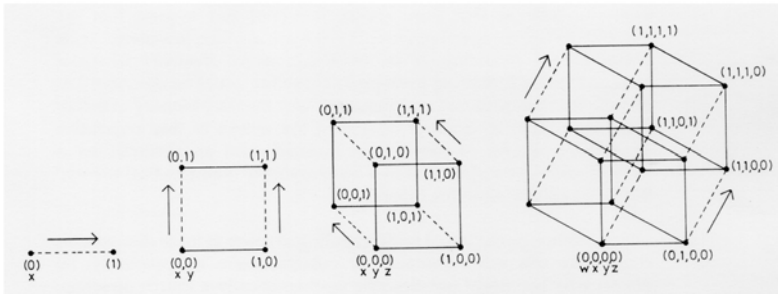
Imagine a single zero-dimensional point and move it a fixed distance in a straight line. Now take that line and move it the same distance in a direction perpendicular to its length. In these two translations we have described a two-dimensional square, and likewise a third movement, translating the square in a direction mutually perpendicular to

each of the preceding directions, will create a three-dimensional cube. At this stage we appear to have used up all the directions available to us. There is, so far as we can tell, no space available for any further axes. But if for a moment we suspend what we believe to be the limits of the space we inhabit, we might imagine that outside the scope of our perception a fourth perpendicular could exist. Were this so, then we could continue by one further stage the process that we have begun. We could take the three-dimensional cube and project it by the same distance in a direction at right angles to each of its axes. The form created by this shift would be the four-dimensional equivalent of a cube, a figure commonly known as a *hypercube* (Fig. 1). At every corner four mutually perpendicular edges would meet, and at each square face two cubic faces would coincide.⁷ This move may appear to be just a conceptual exercise but at the turn of the century (for some theorists at least) it seemed that the *fourth dimension*

represented a very real and attainable world. There was of course no evidence to support their contention, but for the purpose of exploring the artistic opportunities that the fourth dimension could provide, its actual existence or otherwise was of little significance.⁸ Importantly, it was an idea situated on the threshold between art and mathematics at a time when many artists sought to capture the abstract objectivity of science in their work.

Increasingly throughout the nineteenth century, geometry had come to rely less on the graphical devices of synthetic geometry and more on the algebra of analytic techniques.⁹ Unlike synthetic geometry (the diagrams of which can be considered a formal representation), in the abstract shape of equations, little of the experience of form remains. The resultant divergence between geometry and the physical space it had once sought to describe soon therefore gave rise to a new freedom of thought in mathematics. With this freedom

Figure 1. Generating hyperspace. Using Cartesian coordinates, the location of each point can be analysed in terms of its distance from a common origin in the direction of each axis. (Drawn by author)



came many new forms of geometry, among them n -dimensional geometry (which is the study of geometry in any number of dimensions, including the fourth) and non-Euclidean geometry (in which the basic rules that determine the structure of space are amended).¹⁰ Both these propositions use analytic geometry to reverse the process through which the mathematical properties of figures had traditionally been determined. Unlike the geometrical description of a shape such as a circle or a sphere, in these new geometries the description (the formula) precedes the visual representation, and can therefore present to the imagination a clearly defined, rule-based construction, of which there is no real equivalent in experience. In the equations and formulae of analytic geometry it was thus possible to define four-dimensional figures using a technique removed from the difficulties of envisaging four-dimensional space.

In 1843, the mathematician Arthur Cayley published a paper that took many of the theorems of two- and three-dimensional geometry and developed from them the equivalent formulations for four-dimensional space.¹¹ Inherent in his publication was the suggestion that these formulae might be further generalized so as to describe the same relations in n -dimensions. Yet remarkably this Euclidean publication came almost 20 years after another seemingly more dramatic proposition made in 1829. Before this time geometry had rested on five supposedly unassailable first principles:

- A straight line may be drawn between any two points.
- Any terminated straight line may be extended indefinitely.
- A circle may be drawn with any given point as centre and any given radius.
- All right angles are equal.
- If two straight lines lying in a plane are met by another line, and if the sum of the internal angles on one side is less than two right angles, then the straight lines will meet if extended sufficiently on the side on which the sum of the angles is less than two right angles.¹²

Of the five, the fifth is clearly the least obvious. It is apparently more complicated as it appears here, but then it could perhaps be more simply put:

Two straight lines which intersect one another cannot be parallel to the same line.¹³

Nevertheless, although the fifth postulate confirms our local experience, its proof is far removed from the tangible parameters that seem to confirm the other postulates. The limit state of this proposition is the point when the lines become parallel, in which eventuality the only confirmation of their continuing separation is to be found at a location an infinite distance away. Not only therefore is its confirmation always out of reach, but the proof itself denies our earthbound limits to parallel extension. A single line may seem as if it could be extended indefinitely, but parallel lines, like railway tracks heading towards the horizon, always appear to meet in a distant vanishing point.¹⁴

Around 1830, after many attempts to prove the fifth postulate from the other four, mathematicians Nikolai Lobachevsky, Janos Bolyai and Karl Friedrich Gauss each independently demonstrated that it would be possible to devise alternative, non-Euclidean geometries by adopting different sets of rules.¹⁵ Changing the fifth postulate in different ways produces a series of different geometries in which figures behave as if they belonged to a curved space. For example, in the negatively curved space proposed by Lobachevsky and Bolyai, many lines from a single point will approach but never meet a given line, while in a positively curved space devised by Georg Riemann, parallel lines will always cross one another's path.¹⁶ In many cases these geometries directly contradict our intuitive understanding of space, but because these descriptions are not mere arbitrary fictions and are instead consistent mathematical definitions, they have definite discernible features, which may be explored. It is important to note that n -dimensional geometry is not non-Euclidean but because of its application of analytic techniques it shares with these geometries this capacity to exhibit definable characteristics. It was possible therefore to conceive of geometrical figures in four dimensions only because their *existence* was purely conceptual, but by virtue of the fact that these figures could be formulated in algebraic terms it was also possible to interrogate those descriptions to determine their form. Algebra with four variables does not present any greater difficulty to the mathematician than algebra with three, so at least in the terms of analytic geometry the transition is easily made. What the resultant creation would be like if

translated to the presence of a physical object is perhaps considerably more difficult to determine, but it was however (not surprisingly) the question that fascinated the artists and theorists who followed these developments.

In the discovery of non-Euclidean and n -dimensional geometries two important developments had emerged. By releasing geometry from a redundant correlation with physical space, mathematicians had created the opportunity to consider spatial parameters in universal terms. In a lecture delivered at the university of Gottingen in 1854, Georg Riemann urged that a global view of geometry be adopted: a study of manifolds with any number of dimensions, in any kind of space.¹⁷ Less specific than any geometries that had gone before, Riemann's geometry dealt not with points, lines and space but instead with n -tuple coordinates. Geometrical space was now neither confined to three dimensions nor obliged to conform to the linear relations set out in Euclid's five postulates. Such a radical departure from the classical concepts of geometry could not fail to have dramatic implications for the contemporary understanding of space. And as a result, geometry came to play a significant role in philosophical discussions on spatial perception by, amongst others, Hermann Von Helmholtz and Henri Poincaré (both of whose influential and popular texts were widely read by artists in the early years of the twentieth century).¹⁸ As an example consistent with existing concepts of three-dimensional Euclidean space and yet outside human experience, the fourth dimension was considered by many to be an important demonstration of the subjective nature of space.

Popularized in this manner, the fourth dimension continued to enjoy widespread public attention through to the late 1920s. The tantalizing glimpses offered by mathematics into its intangible space inspired artists, writers and philosophers to speculate on the possible nature and expression of four-dimensional experience. The artistic possibilities were apparently diverse, supporting creations as disparate as those of Lewis Carroll and Theo van Doesburg.¹⁹ And although each were to develop their own interpretations, what all exponents seem to share is a sense of rupture. The new geometries were seen not only as a visual language from contemporary culture, but seemingly as an instrument with the power to revolutionize the classical view of the universe.²⁰

For many of the artists of the early twentieth century, eager to reject established artistic values, non-Euclidean and n -dimensional geometries had symbolic significance. Representing, for these artists, a uniquely contemporary position, the use of geometry reflected the increasing significance of science as an artistic ideal that drew by association on the particular power of these concepts to revolutionize the disciplines from which they came.²¹ One artist perhaps more interested than most in severing links with established artistic values was El Lissitzky. Teaching architecture in the ferment of post-revolutionary Russia, Lissitzky was driven to find new forms of expression that would resonate with the new political ideals.²² In 1919 Lissitzky began teaching architecture at the Vitebsk State Free Art Workshops. By the end of that year Kazimir Malevich had become head of the school, and a fundamental restructuring of the school's

activities began to take place. Renamed Champions of the New Art (UNOVIS), it sought to teach a mode of artistic expression that rejected the depiction of recognizable objects in favour of a new non-objective representation of pure form and colour – *Suprematism*.²³

'For us Suprematism did not signify the recognition of an absolute form which was part of an already completed universal system. On the contrary here stood revealed for the first time in all its purity the clear sign and plan for a definite new world never before experienced. . . . Many revolutions were needed in order to free the artist from his obligations as a moralist, as a story teller or as a court jester, so that he could follow unhindered his creative bent and tread the road that leads to construction. . . . From this point the picture started to gain stature as a new world of reality and in this way the foundation stone for a new representation of the shapes and forms of the material world was laid.'²⁴

For Lissitzky, geometry lay at the very heart of the Suprematist's visual language. In his 1925 essay, *A. and Pangeometry*, Lissitzky attempted to describe the representation of space in terms of the geometrical concepts that support it.²⁵ Art, he suggested, is an invention of the mind, a complex where rationality is fused with imagination. This interface becomes the point at which the virtual space of geometry and our experience of physical space combine to become pictorial space. By comparing the geometry of perspective with the geometry of Suprematism, Lissitzky intimated that

Suprematism should be seen not as a style but as a technique. In the name of progress, he presented Suprematism as a radical departure from established modes of representation, and described it as an inevitable response to advances in theoretical geometry.²⁶

'Perspective representation of space is based on a rigid three-dimensional view of the world based on the laws of Euclidean geometry. The world is put into a cubic box and transformed within the picture plane into something resembling a pyramidal form. . . . This is a facade view of the world, where depth becomes a stage viewed statically. . . . Here the apex of the visual cone has its location either in our eye, i.e. in front of the object, or is projected to the horizon, i.e. behind the object. The former approach has been taken by the East, the latter by the West. Perspective limits space, it has made it finite, closed.'²⁷ (Fig. 2.)

'Until our time the "sum total" of A.[rt] has not experienced any new extensions. However, a fundamental reorientation has taken place in science. The geocentric cosmic order of Ptolemy has been replaced by the heliocentric order of Copernicus. Rigid Euclidean space has been destroyed by Lobachevski, Gauss, and Riemann.'²⁸

Using Cubism as his example, Lissitzky described the explosion of perspectival space that, he claimed had brought the horizon to the foreground.²⁹ His description is suggestive of development: as if the perspective pyramid were to open out, pulling with it the boundaries of pictorial space.³⁰

Reference has often been made to Lissitzky's interest in mathematics, and it must certainly be regarded as an important influence in his art. But despite Lissitzky's purported mathematical knowledge, it is unlikely that he referred directly to mathematical papers.³¹ In his search for geometrical ideas he may instead have turned to one of the many popular commentators on scientific discourse, among them scientist and mathematician Henri Poincaré.³² For Poincaré, geometry was simply an abstract construct without any necessary adherence to the space that we perceive around us. In *Science and Hypothesis*, published in 1905, Poincaré mused that had the mechanisms that control vision been configured differently, we might have developed a four-dimensional understanding of space.³³

'Nothing prevents us from assuming that a being with a mind like ours, with the same sense organs as ourselves, may be placed in a world in which light would only reach him after being passed through refracting media of complicated form. The two indications which enable us to appreciate distances would cease to be connected by a constant relation. A being educating his senses in such a world would no doubt attribute four dimensions to complete visual space.'³⁴

In his analysis of the relation between geometrical and perceptual space, Poincaré relied heavily on physiological sensation: the raw data of experience, the touch of light on the retina, or the contraction of a muscle as we reach for a distant object.³⁵ Unlike the strict positivism of theorists

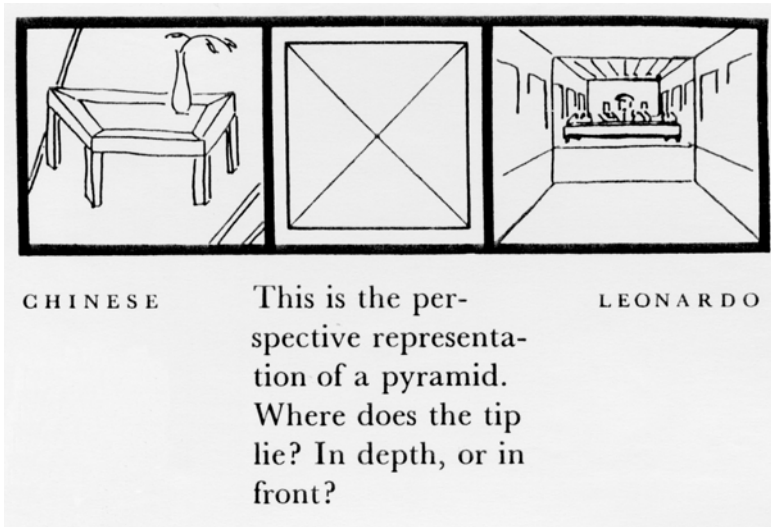


Figure 2. El Lissitzky, *A. and Pangeometry* (Europa Almanach, 1925).

such as Hermann Von Helmholtz, however, Poincaré maintained that geometry was independent of experience: a schematic and unambiguous conceptual space. As such, Euclidean geometry may, he suggested, be considered to have based its original precepts in the space of our perceptions but in all other respects be essentially an independent idealized space, comprising only conventions.³⁶ To Poincaré it made no sense to ask whether real space were Euclidean or non-Euclidean,³⁷ because perceptual space and geometry were, to him, different in kind:

'It is seen that experiment plays a considerable role in the genesis of geometry; but it would be a mistake to conclude from that that geometry is, even in part, an experimental science. . . . Its object is certain ideal solids, absolutely invariable, which are but a greatly simplified and very remote image of them. The concept of these ideal bodies is entirely mental, and experiment is but the opportunity which enables us to reach the idea. . . . Experiment guides us in this choice, which it does not impose on us. It tells us not what is the truest, but what is the most convenient geometry.'³⁸

Thus, although experiences were for Poincaré the foundation of geometry, there was in his opinion no need for the fabric of space itself to match any particular geometry.³⁹ Furthermore, because his claims on perceptual space extended only to the internalized sensations of human physiology, he believed that there was also the opportunity to change those sensations and instigate a new understanding of space. By releasing perception from the necessity to adhere to any concrete geometrical structure, Poincaré thereby allowed himself the freedom for speculation on the nature of space that had been denied to Helmholtz:

‘Experience does not prove to us that space has three dimensions; it only proves to us that it is convenient to attribute three to it.’⁴⁰

‘So the characteristic property of space, that of having three dimensions, is only a property of our table of distribution, an internal property of human intelligence, so to speak.’⁴¹

‘Perhaps somebody may appear on the scene some day who will devote his life to it, and be able to represent to himself the fourth dimension.’⁴²

Fifteen years earlier an English mathematician, Charles Howard Hinton, had already made such an attempt.⁴³ Like Poincaré, Hinton speculated that the limits of our perception did not constitute any proof that physical space was likewise limited. To speculation, Hinton added belief, convinced as he was that learning to perceive the fourth dimension

would simply require the necessary dedication. But while Poincaré saw geometry as a purely mental construct, Hinton, like Helmholtz, chose to retain the notion that experience and geometry were inextricably linked. Hinton’s belief in the existence of a fourth spatial dimension could not, however, allow him to accept the necessity for empirical proof. Taking the possibilities that n -dimensional geometry presented as a clue to a higher state of being, Hinton presented the specific mathematical characteristics of four-dimensional space as a structure around which the perceiving subject might develop the capacity for four-dimensional experience. In the clearly defined objects of four-dimensional geometry, Hinton found a firm grounding for the mental construction of four-dimensional space. By practised mental rehearsal of these figures, he argued, the subject must learn to intuit the necessary spatial relations. In his two major books, *A New Era Of Thought* and *The Fourth Dimension*, Hinton developed a system through which he claimed a perceptual understanding of the fourth dimension might be attained. It is perhaps not altogether surprising that the geometrical object that Hinton chose as the basis for his system was the most fundamental of all four-dimensional solids: the four-dimensional cube.⁴⁴ Termed by Hinton the *tesseract*, this four-dimensional figure was to become a symbol for the representation of four-dimensional space.

A three-dimensional cube is of course bounded on six sides by two-dimensional squares. So, by analogy, as strange as it may seem, a four-dimensional cube would be bounded by eight

three-dimensional cubes. Hinton was thus to turn his attention to the cubes that form the perimeter and section of the tesseract in much the same way that an artist may construct a perspective space by defining the planes that enclose and dissect three-dimensional space. His system for the visualization of the fourth dimension was nevertheless remarkably ungeometric, and concentrated predominantly on the exercise of the imagination. As its basis, this technique required the *unlearning* of established spatial concepts such as up and down or left and right, which were to his mind only symptoms of our constricted perception.⁴⁵ By carefully studying the relation between the sides and edges of a cube that is free to rotate in all directions, he suggested we might in time achieve the rejection of our existing spatial orientation – a necessary purging of our spatial intuition, creating as it were the void in which a four-dimensional sense of space might be constructed.

Thus prepared, Hinton presented the *tesseract* to his readers as a series of cubes. Together these cubes, or *tessera*, would form a complete description of the hypercube, as square slices through a block might be combined to recreate its original form. The most significant problem that faced Hinton in this endeavour was, therefore, the need to identify the component parts of his creation. If his readers were to stand any chance of constructing the four-dimensional cube in their minds, they would require a way of matching one part with another: a key and the instructions to the assembly of spatial relationships completely outside human experience. Hinton's solution was colour, describing in *A New Era Of Thought* a

complex assemblage of colours, with each component point, line, square and cubic interior being assigned a separate colour (Fig. 3).⁴⁶ Hundreds of different and obscure colours create a bewildering number of colour relationships, and although these were greatly simplified for his second book, *The Fourth Dimension*, by using primary colours, it is unlikely that many of Hinton's readers were able to hold a sufficient number of the colours in their minds to build up any kind of a notion of what four-dimensional space might be.⁴⁷

'Now to do this, we must form the habit of mental painting, that is, of putting definite colours in definite positions, not with our hands on paper,

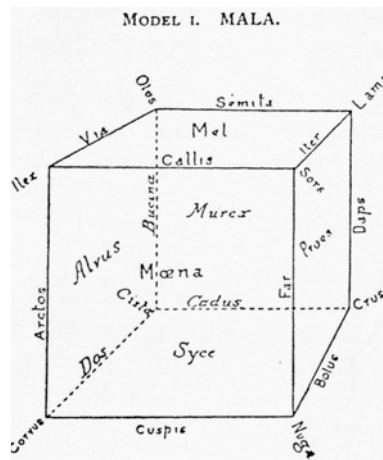
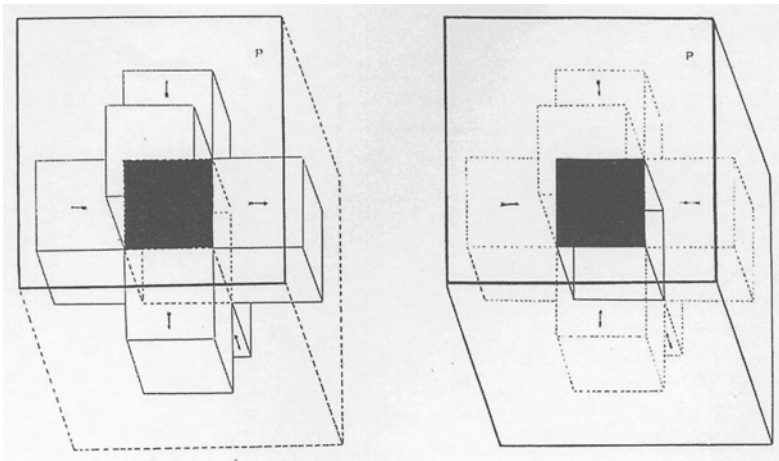


Figure 3. One of the cubic faces to the tesseract (from Charles Hinton, *A New Era of Thought*, 1888)

but with our minds in thought, so that we can recall, alter, and view complicated arrangements of colours existing in thought with the same ease with which we can paint on canvas. This is simply an affair of industry; and the mental power latent in us in this direction is simply marvellous. In any picture, a stroke of the brush put on without thought is valueless. The artist is not conscious of the thought process he goes through. For our purpose it is necessary that the manipulation of colour and form which the artist goes through unconsciously, should become a conscious power, and that, at whatever sacrifice of immediate beauty, the art of mental painting should exist beside our more unconscious art.¹⁴⁸

Hinton's aims were most certainly painterly and, it might be noted, not entirely dissimilar from those of artists such as Malevich, Theo van Doesburg and Lissitzky. In this respect, as in many others, a comparison between these artists' work is revealing. It is very likely that van Doesburg, for example, would have appreciated Hinton's use of primary colours as the basis of his systematic colour scheme. Indeed, in the course of his prolific writings on art and architecture, van Doesburg often included an illustration of the hypercube *folded down* into three-dimensional space (Fig. 4).⁴⁹ And remarkably, by applying these colour relationships to van Doesburg's drawing (that is, by assigning a primary colour to each of the four axes of four-

Figure 4. Developed hypercube, (Theo van Doesburg, *Die Form IV*, 1929)



dimensional space), the result that is thus obtained, might quite easily be seen as the foundation for his *Counter-Compositions* (Figs 5 and 6). Here van Doesburg very clearly used colour as Hinton had done to differentiate the various component planes of the composition. But are the comparable forms and colours of Lissitzky's paintings testament to a similar interest in Hinton's system? Hinton's texts were certainly known in Russia in the years immediately preceding 1909, and were to form the basis for a large body of work on the fourth dimension by the Russian theosophist Petr Uspensky.⁵⁰

Uspensky's somewhat more mystical treatise, also entitled *The Fourth Dimension*,⁵¹ recounted the same examples as those devised by Hinton to illustrate his proposition, including a detailed description of Hinton's *tesseract*, an idea that in turn found its way through to Malevich's artistic doctrine:

'The influence of colour on the artist has encountered in him the same actions of interrelation established on the surface of the canvas. By the establishment of interrelations man links reflections of existence, as the shadow is linked to the body and cannot exist independently of it.'⁵²

Certainly, by 1915 Malevich was exhibiting several abstract geometrical paintings at the 0.10, Last Futurists Exhibition, five of which bore the subtitle *Colour Masses In The Fourth Dimension*, the association between colour and the fourth dimension clearly indicating the influence of Uspensky's writing (Fig. 7).⁵³

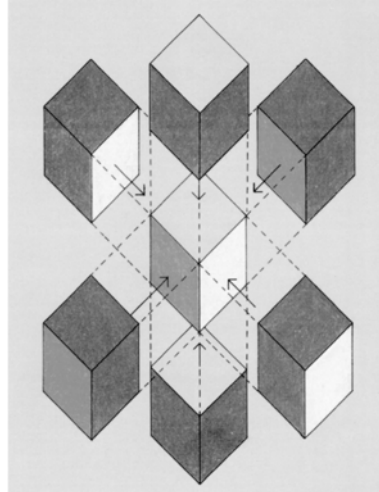
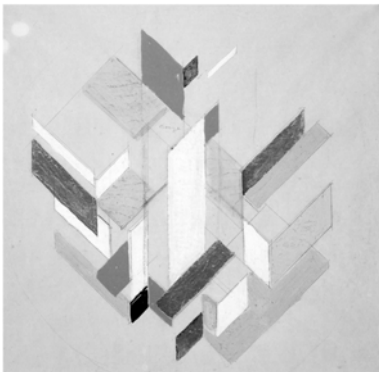


Figure 5. Theo van Doesburg, *Counter-Composition in Primary Colours*, 1923 (Rijksdienst Beeldende Kunst, The Hague).

Figure 6. Assigning primary colours to the four planes of the hypercube. (Drawn by author)

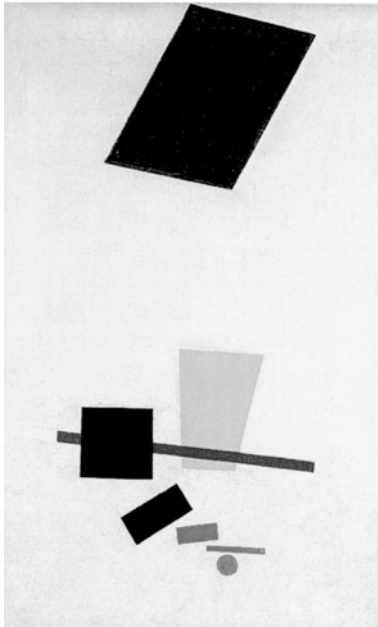
Like Hinton's *tesseract*, Lissitzky also constructed as if from colour itself. In his lecture of 1922 entitled 'New Russian Art', Lissitzky described the *dynamic tensions* between flat surfaces and colours.⁵⁴ The colours were to be seen in tension with their plane, as if by some means pulling away from the surfaces in which they resided:

'New optical experience has taught us that two surfaces of different intensity must be conceived as having a varying distance relationship between them, even though they may lie in the same plane.'⁵⁵

Passing the hypercube through three-dimensional space, Hinton observed, would enable us to experience something of its four-dimensionality within the limited confines of our own three-dimensional perception. Just as the length of a train may be judged by how long it takes to pass under a bridge, so extension in the direction of the fourth dimension might he suggested, be intuitively felt, by depicting the apparition of successive sections through the hypercube.⁵⁶ As the *tesseract* is turned and dissected in different directions, the appearance from our three-dimensional perspective would be of a cube of constantly changing colours. The structure of this experience would therefore be connected to its four-dimensional form only by the duration of each colour.⁵⁷ Thus, assuming Lissitzky's paintings to represent this system, the illusion of the apparent distance between colours may be seen, not only to describe a varying depth in relation to the fixed datum of the picture plane, but also to signify four-dimensional extension (Fig. 8).⁵⁸

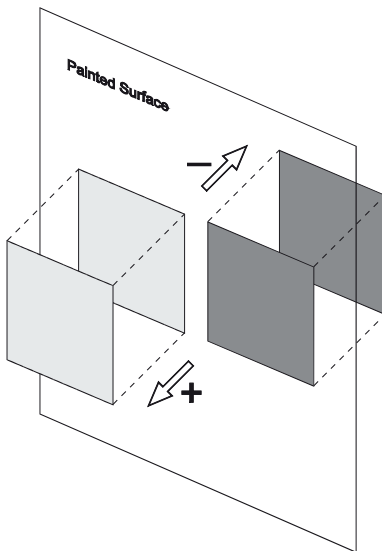
'The colour of space is no longer assumed to be a single blue ray of the colour spectrum, but the whole spectrum – white. Suprematist space can be formed in front of the surface as well as in depth. If one assigns the value 0 to the picture surface, then one may call the depth direction – (negative), and the frontal direction + (positive), or vice versa. Thus, suprematism has swept away the illusion of

Figure 7. Kasimir Malevich, *Painterly Realism of a Football Player – Colour Masses in the Fourth Dimension*, 1915 (Stedelijk Museum, Amsterdam).



three-dimensional space on a plane, replacing it by the ultimate illusion of irrational space with attributes of infinite extensibility in depth and foreground'.⁵⁹

Building from colour as Hinton had done, Lissitzky's paintings appeal to our mental capacity for the construction of space from the relation of colours. Yet to make the leap from this essentially three-dimensional impression of depth to the illusion of four-dimensional space required a tech-



nique by which further axes could be represented within the two-dimensional surface of the canvas. The answer for Lissitzky (as for many others attempting to represent four-dimensional space) was axonometric projection.⁶⁰ Through axonometric projection Lissitzky was able to construct a three-dimensional space within the pictorial depth of the painting and yet, and at the same time, allow flat areas of colour to project forward to the surface (Fig. 9). Overlaying *colour space* on axonometric form created a sense of disparity in the *Proun* paintings. The elements of form and colour are at odds, creating an ambiguity that defies representation in three dimensions. Exploiting the claim that it may be possible to conceive of spatial constructs outside our normal experience, Lissitzky attempts, via the painting, to control the perceptual data and sensory clues that allow us to build a mental model of the space represented.⁶¹ Importantly, however, this intervention between the object and the observer is not based purely on sensation. Like perspective, these devices appeal to the psychological not the physiological part of vision.⁶² The duality is not in the manner of, for example, after-images between the image and the physiological sensations of the subject, but rather between the physical object of the painting and the space we apprehend within it. Our attention is drawn towards the colour as a material quality of the real object of art – the painting itself. His *Prouns*, and their use of colour are, as he described them, *constructions* in so far as they distil the psychological effects of colour and place them in opposition to form. In so doing they construct a space of disparity between them, encoding the

Figure 8. Colours interpreted as if having relative distance between them. (Drawn by author)

relation between geometrical and perceptual space in axonometry and colour.

'In this way *Proun* goes beyond painting and the artist on the one hand and the machine and the engineer on the other, and advances to the construction of space, divides it by the elements of all dimensions, and creates a new, many-faceted unity as a formal representation of our nature.'⁶³

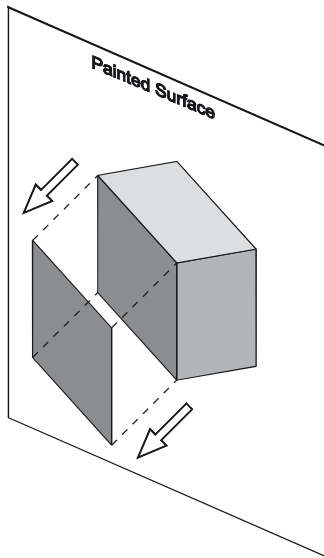
'Strictly speaking, distances in this space are measured only by the intensity and the position of

rigidly defined colour planes. Such space is structured within a framework of the most unequivocal directions: vertically, horizontally, or diagonally. It is a positional system.'⁶⁴

Some colours, such as blue, may appear to recede, while others like red appear to thrust themselves forward out of the painting. The diagonal composition that results from representing rectilinear forms in axonometry takes this structure and projects it. In the act of this projection it creates an illusion reminiscent of four-dimensional space. It is as if there were two competing spaces, one formal and one coloured, which vie for priority. In the spatial experience neither takes precedence; the spectator's interpolative power oscillates between the two readings, unable to settle on one or the other. For both Lissitzky and van Doesburg, axonometric serves to open out the space contained by the painting, expanding and extending its boundaries into an impression of four dimensions.⁶⁵ The cube, Lissitzky said, has three basic directions, but turned on end (as in axonometry) it becomes *quadratic* (Fig. 10).⁶⁶

Yet although Lissitzky and van Doesburg both adopted axonometry in the representation of four-dimensional space, neither was the originator of this device. In fact it not only predates Lissitzky's early *Proun* work but even predates the thought experiments of Hinton and Uspensky. In 1880, almost ten years before the publication of Hinton's first book on the fourth dimension, in an article entitled 'Regular figures in *n*-dimensional space' an American mathematician, Washington Stringham, described a synthetic correlative to the analytic

Figure 9. An impression of four-dimensional space produced by the combined effect of axonometry and colour. (Drawn by author)



methods of n -dimensional geometry: a graphic device by which, using axonometric projection, the properties of the *hypercube* could be projected into two dimensions.⁶⁷ Axonometry facilitated this technique because it could in its way represent graphically the pattern by which Euclidean n -dimensional geometry defines dimensionality.

To produce a scale drawing in axonometry, dimensions must always be projected back from orthogonal axes. In other words, as with the Cartesian system of coordinates, lengths must always be analysed into distances in the direction of each dimension. A point that does not fall on

any of the chosen axes will therefore need to be drawn by measuring its distance from the origin along each of the axes. Lines drawn parallel to the axes at these distances will then intersect at the required point and locate it in the axonometric space of the drawing. Unlike perspective but similar to geometry, axonometric space is homogeneous, and dimensions therefore remain consistent such that one set of dimensions may be added directly to another set. In this way the space may extend infinitely in any direction without ever reaching an horizon. It is an extraordinary feature of perspective that it includes a finite point which represents infinity; a seemingly contradictory position, which in the context of the drawing is a tangible stopping point but which represents infinite extension in its subject. Conversely, however, axonometry removes the vanishing point to infinity and thereby takes it out of the picture.⁶⁸ For this reason it has been suggested that Lissitzky saw axonometry as a way by which we might apprehend infinity. Clearly though, axonometry does not make infinity appear on the page, in which respect it accurately reflects the geometrical definition of infinity but does not bring us any closer to its representation.

'The Futurists shattered the single vanishing-point of the lines of perspective and scattered the fragments all over the canvas. Suprematism swept away all the fragments and opened the way to infinity.'⁶⁹

In his essay 'Metamorphosis of axonometry' Yve-Alain Bois is clear on this point. Lissitzky's use of axonometric is not, he says, to make infinity

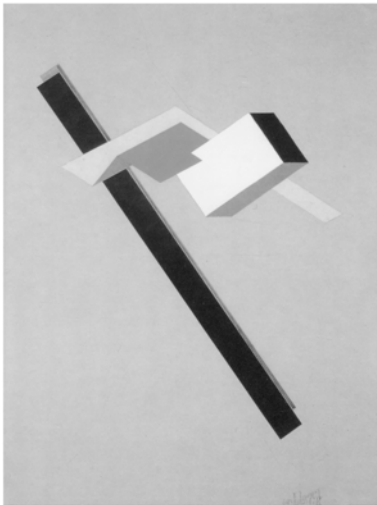


Figure 10. El Lissitzky, *Proun G.K.*, 1922/23 (Museum of Modern Art, New York).

visible, but rather to make it *thinkable*.⁷⁰ This effect is obviously just a consequence of the already stated metrical properties of axonometry, but it is also the point around which its Euclidean character hinges. There is no diminution of objects in axonometry as they recede into the distance, and in this sense it therefore has a much greater affinity with Euclidean geometry than with perspective – which is odd, because it is the assumed Euclidean nature of perspective at which most criticism including Lissitzky's is aimed.⁷¹ It is fundamental to Euclidean geometry that space is homogeneous, and therefore that objects do not distort as they move around. Indeed it is part of the definition of Euclidean geometry that parallel lines should never meet:

'Parallel straight lines are lines which being in the same plane and being produced indefinitely in both directions do not meet one another in either direction.'⁷²

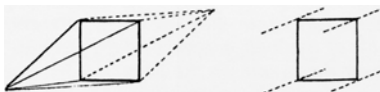
'Perspective', said Lissitzky, 'Limits space; it has made it finite, closed'. Lissitzky illustrated his point with a diagram of perspective as a square pyramid (Fig. 11).⁷³

'Suprematism has extended the apex of the finite visual cone of perspective into infinity . . . Thus Suprematism has swept away the illusion of three-dimensional space on a plane, replacing it by the

ultimate illusion of irrational space with attributes of infinite extensibility in depth and foreground.'⁷⁴

The inherent similarity between axonometric and Euclidean geometry means that any geometrical figure may therefore be projected graphically to describe volume in a coherent analogy of its mathematical definition. While the linear dimensions are preserved, however, a distortion has nevertheless occurred, compressing the Cartesian axes to enable them to *fit* into a two-dimensional plane. Usefully, so far as geometry and indeed architectural drawing are concerned, the metrical properties of rectilinear shapes are maintained, but only in the direction of the three axes. Dimensions across the diagonals have been adjusted to allow the angles between the *x*, *y* and *z* directions to flex. They are now no longer 90°, or even equal angles apart, despite a projective relation to the geometric properties of the form they represent. The faces of a cube drawn in this way are not perpendicular to one another, but there are nevertheless the correct number of vertices, edges and sides, all correctly connected. Used in a way that adheres to the reticulated structure of the Cartesian grid, axonometry may thus successfully portray geometric figures such as the cube so as to emphasize the abstract nature of their definition. Indeed, the dimensional relationship between axonometry and geometry ensures that the experience of looking at the drawing must be closer to the structure of geometrical space than to the experience of a correlative real space. The same cannot of course be said of perspective, which very clearly corresponds to the optics of vision at the expense of geometrical

Figure 11. El Lissitzky, *A. and Pangeometry* (Europa Almanach, 1925).



relations.⁷⁵ Lissitzky's choice of axonometry as the predominant expression of *Proun* might thus be taken as an attempt to avoid the naturalistic depiction of real space and real objects, in favour of the abstract space of mathematics.

'On the basis of terrestrial scale relationships, Euclid constructed a mathematical space that knows no curvature, and that is therefore capable of receiving a square on the surface. This in turn allows us to measure the square on the basis of a fixed scale. Using a square as a base, a cube can be constructed accordingly.'⁷⁶

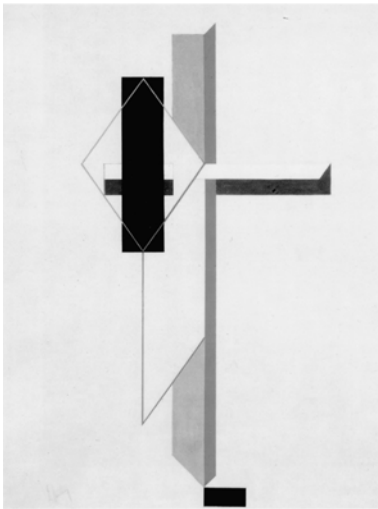


Figure 12. El Lissitzky, *Proun*, 1922 (Museum of Modern Art, New York).

'Fulfilment depends on the arrangement of space by means of lines, planes, volumes. No self-contained, individual bodies, but relations and proportions.'⁷⁷

Proun is essentially about objects: not their natural appearance, but the Platonic definition of an idealized geometrical form. Lissitzky's paintings depict clusters of objects, comparable to real objects but recognizable as the primary geometric forms (lines, planes and volumes) that define geometrical space (Fig. 12). The fact that axonometry can so effectively represent the geometry of three dimensions in a flat, two-dimensional plane suggests, however, that it may have further potential. A completely new direction could in theory be introduced within the plane of the paper, and with it a further spatial dimension. The dimensional series might then be continued, projecting the three-dimensional cube a unit distance in this new direction to produce a two-dimensional representation in axonometric of a form that can exist only in its geometric description – a four-dimensional cube. This is the diagram published by Stringham, and like the equivalent axonometric of a three-dimensional cube, his view of the hypercube combines all the criteria of its mathematical definition with an unexpectedly strong impression of spatiality.⁷⁸ Unexpected, that is, because the four-dimensional space it encloses is, and will remain, completely outside our experience (Figs 13–15).

Whether by accident or by virtue of a remarkable leap of visualization, this illustration is fraught with both diagrammatic meaning and visual

Figure 13. Projection of a four-dimensional cube (the hypercube). (Drawn by author)

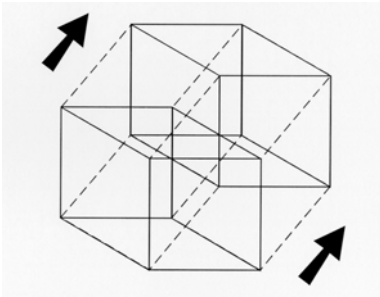
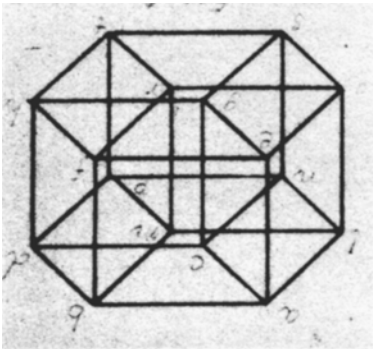


Figure 14. Axonometric representation of a four-dimensional cube (Washington Stringham, "Regular figures in n -dimensional space", *American Journal of Mathematics*, 1880)



information. As a diagram it provides in its mathematical aspect a model of the hypercube in which the metrical properties of each of its edges can be maintained. Between these edges, the correct number of component cubic faces can easily be identified, and each is found to share the correct

square faces with its neighbours. In addition to its diagrammatic consistency, and perhaps more importantly with regard to the artistic interpretations it would inspire, this illustration also supports a great deal of visual inconsistency. This inconsistency is not destructive; it is in fact the quality that makes this illustration a remarkable visual expression of four-dimensional space. What it depicts is, after all, impossible to resolve in the context of our uniquely three-dimensional spatial experience. But there is an ambiguity in this drawing that precedes the four-dimensional nature of its subject. Axonometry itself appears to distend pictorial space, as if the most distant points in perspective have been pulled into the foreground. The openness of axonometry; (its dimensional consistency) releases the static viewpoint, and leaves it free to move around the drawing.⁷⁹ Because, in axonometric space, objects do not diminish as they become more distant, they appear always in a dual aspect. They cling in a shallow space on the surface of the drawing while at the same time sliding back along their oblique lines into pictorial depth. At local points in a drawing they may seem consistent, while globally full of contradiction.⁸⁰

Lissitzky, like many artists, used this phenomenon to interesting spatial effect. Almost all of his *Proun* paintings contain some element of ambiguity.⁸¹ A cube drawn in axonometric projection may appear to extend forward out of the paper or back into depth. When this is combined with the outline of other overlapping objects, the observer may be guided towards assuming one solution or another. Lissitzky, however, purposely removed such clues to leave

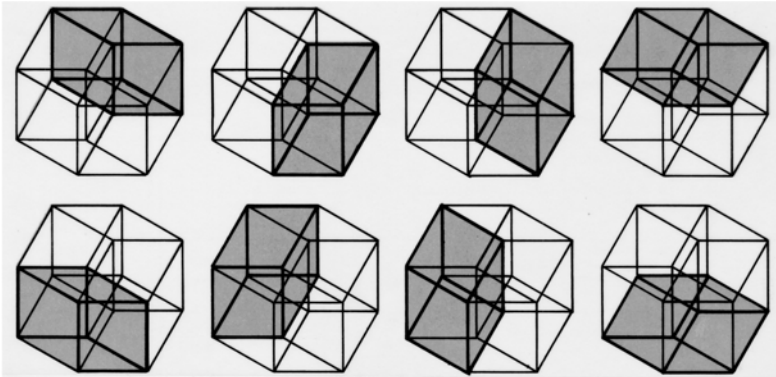
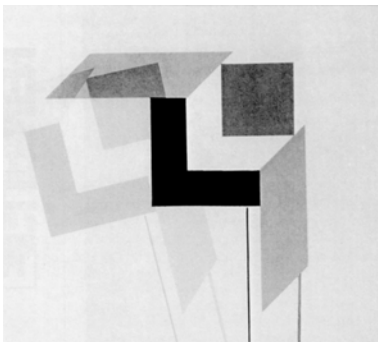


Figure 15. The eight cubic faces of the hypercube. (Drawn by author)



single axonometric planes free to adopt different and opposing postures. The result becomes dynamic as it appears first in one aspect and then

the other in an endless stream of inversions (Fig. 16).⁸²

It should be noted that Lissitzky's drawings share much in common with Stringham's diagram. But it should also be remembered that the active ingredient in the illusion it presents – its reversibility – is a recurrent phenomenon. In *Art and Illusion*, Ernst Gombrich suggested that this kind of ambiguity may be the essence of Cubism, but he also identified examples in the mosaics of antiquity, long before the possibility of a fourth dimension had even been considered.⁸³ This phenomenon was not invented with the diagram of the hypercube, but it is nevertheless at the heart of its success. It is also the spatial impression (more psychological than mathematical) on which so much of the artistic work of the fourth dimension relies.⁸⁴ It may be no more like four-dimensional space than an axonometric of a cube is like three

Figure 16. El Lissitzky, detail of a *Proun* from the *Kestner Portfolio*; 1^o *Kestnermappe Proun*, print nr. 4 (Sprenghel Museum, Hanover).

dimensions. But in the same configuration of lines, mutually exclusive viewpoints are held suspended, creating between them a spatial tension that alludes to some intermediate void: a space connecting these contradictory positions. It is ambiguous, but it is precisely because it cannot be resolved in three dimensions, and because its inconsistency is directly related to the mathematical features of a four-dimensional solid, that it is such a good means by which to express the properties of four-dimensional space.

That Lissitzky gained inspiration from this diagram, or at the very least in the qualities that sustain it, there can be little doubt. His use of a remarkably similar form of illustration to depict the Hanover exhibition room is evidently contrived to maximize the effect of reversibility (Fig. 17).⁸⁵ The interior is shown simultaneously from different angles, and mutually exclusive views are therefore interlocked in the same moment on the surface of the picture. This drawing can of course be viewed either way up, but whichever way it is turned a contradiction remains. A point that in one view appears to be the far corner of the room, in the other appears to be nearest to the observer. As soon as we become aware of its ambiguous quality, we can no longer bring it permanently to any one stable form. As our eyes move around the picture, walls and floor switch back and forth in their allotted zone. In each position only parts of the drawing can ever be reconciled because as a whole it remains an anomaly. The space caught between its two aspects is impossible to grasp, yet there is a sense that it is there. There are enough recognizable spatial clues to make us expect a resolu-

tion to the dilemma but not enough to make a coherent picture. Consequently, we are left with the impression that there is something we are missing: that somewhere between the disjointed volumes is a connection that lies outside our usual understanding of space. These two aspects are held in the hypercube, and in Lissitzky's drawing alike, as if connected by projective wires – tensile strings, pulling at both ends of the discontinuity, like the connection between parts of an exploded view.⁸⁶ Nowhere can this be more acutely felt than in the *Proun* room, where its different viewpoints coexist in a mutually connective space (Fig. 18).⁸⁷

In 1923 Lissitzky was given the opportunity to design a three-dimensional display of *Proun* space for the Berlin art exhibition. Attached to each of the walls were painted reliefs constructed partly by painting directly onto the walls, and partly with panels and lengths of painted wood.

'The space (as exhibition space) was designed by using elementary forms and materials: line, surface and rod, cube, sphere, black, white, grey, and wood; in addition, surfaces were applied flat to the walls (colour), and other surfaces were placed at right angles to the walls (wood). The two reliefs on the walls provide the theme and focus for all the wall surfaces.'⁸⁸

In elevation, these compositions appear much like Lissitzky's paintings, yet more shallow and regular; they are seemingly much less evocative of depth. Seen, however, as an occupant of the room might see them – at an acute angle – the spatial orientation of these forms becomes apparent. From

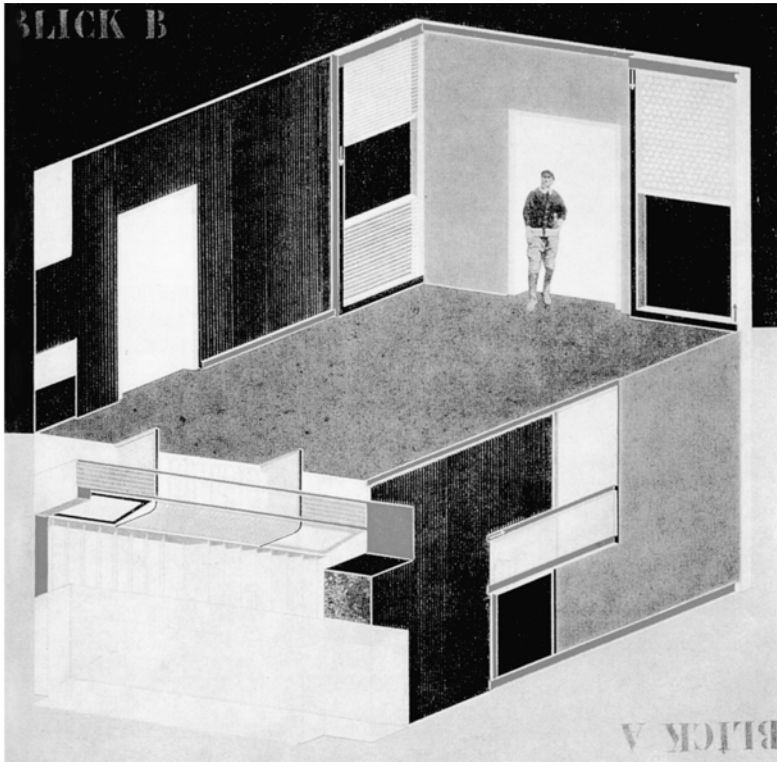
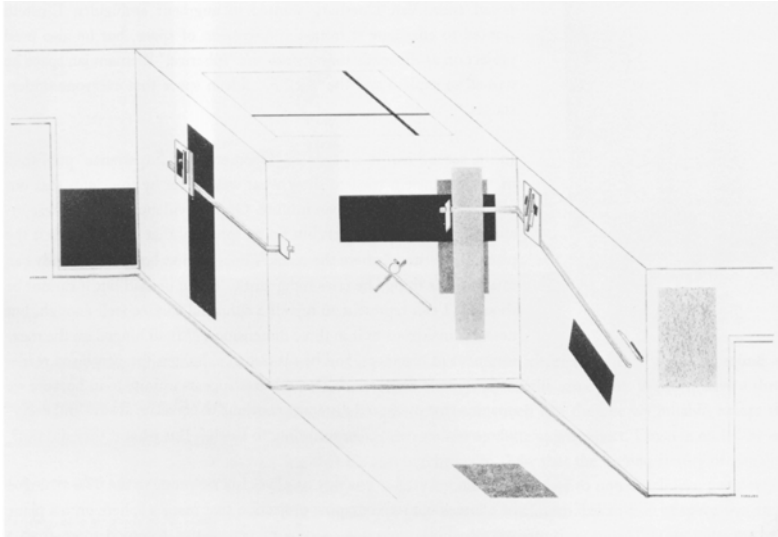


Figure 17. El Lissitzky, design for the second exhibition room, Niedersächsische Landesgalerie, Hanover, 1927–8 (*Abstraktes Kabinett*) (Sprengel Museum, Hanover).

Figure 18. El Lissitzky, design for the *Proun* room, Berlin Art Exhibition, 1923; (*1° Kestnermappe Proun*, print nr.6) (Sprenkel Museum, Hanover / Tretyakov Gallery, Moscow).



this position the viewpoint of the observer sets these forms on end and twists them such that it is no longer readily apparent whether their visual form is the product of their actual shape or the perspectival distortion of the view (Fig. 19).

‘Thus, space has to be organised in such a way as to impel everyone automatically to perambulate in it.’⁸⁹

Articulated from the surface of the walls, the composition of the coloured panels will respond to

the movement of the observer, as a scratch on the surface of a window may appear to move in relation to the landscape beyond.⁹⁰ The parallax movement of one panel against another creates a dynamic image, and defines the boundaries of an altogether different form. As the observer moves to the right, so the position of a panel relative to the wall appears to move to the left. Black rectangles painted on the walls act like markers, against which relative positions may be measured; for every movement in the observer there would seem to be an opposite movement in this antithetic space. This

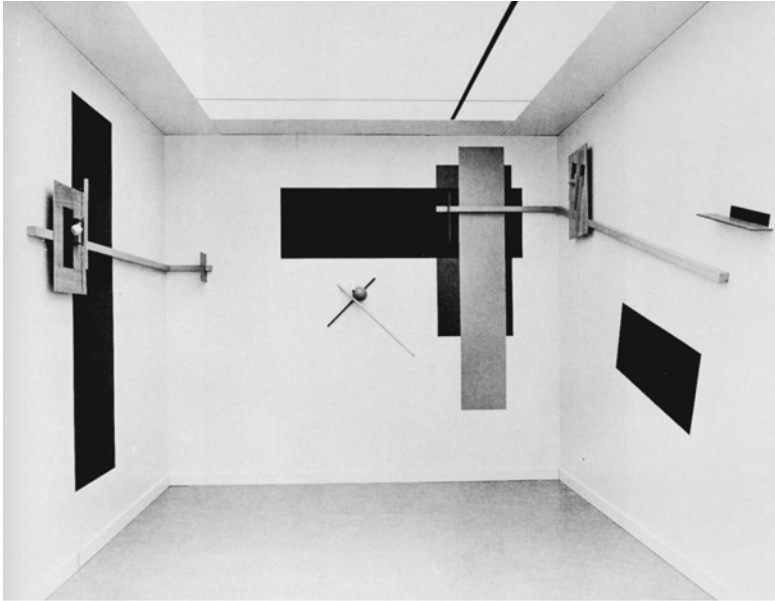


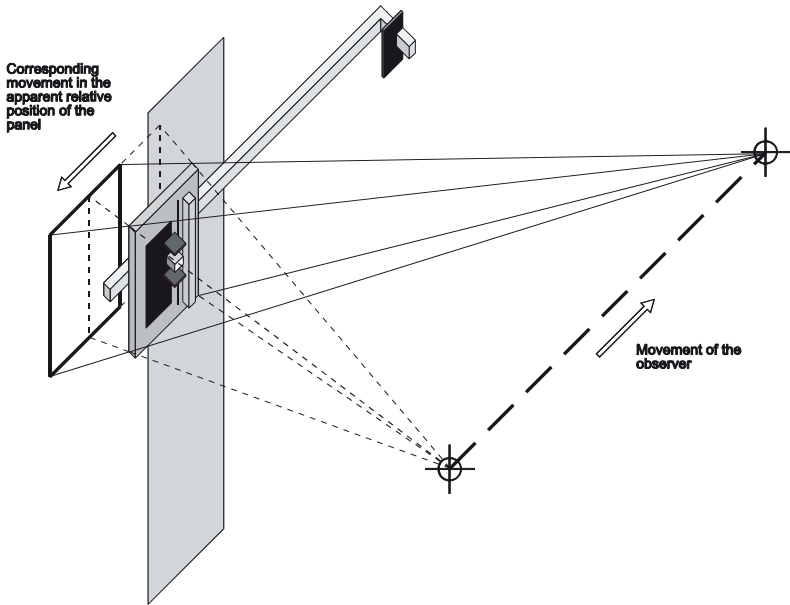
Figure 19. El Lissitzky, *Proun room*, designed for the Berlin Art Exhibition, 1923; reconstruction, 1965 (Stedelijk van Abbe Museum, Eindhoven).

then is a space created from the relation of objects, and because its form is directly linked to the movement of the observer, it therefore *exists*, coincident with the space of the room, as if superimposed upon the existing walls yet intimately linked to their arrangement (Fig. 20).

Theo van Doesburg's diagram of the developed hypercube often contained arrows, indicating perhaps some kind of motion in the direction of

the fourth dimension.⁹¹ But this diagram represented only a flattened and therefore dismantled four-dimensionality. Hinton suggested instead that our only experience of a four-dimensional cube would be by moving it through three-dimensional space. In Hinton's example, that experience would be of coloured cubes changing over time.⁹² Thus, by exploiting the actual motion of the observer, Lissitzky would appear once again to parallel

Figure 20. The effect for an observer moving across the *Proun* room.
(Drawn by author)



Hinton's experiments with four-dimensional perception, now within the medium of architectural space. Like Hinton's imaginary experiment, the objects in Lissitzky's *Proun* room present themselves as if as a series of sections that fold into view as we move past. While the surface of the wall will undeniably appear in motion relative to the observer, the success or failure of this device to create any kind of virtual space is determined exclu-

sively by the observer's mental capacity to build on the successive perceptions. As with Hinton's ever-changing cubic sections, the imaginative capability of the observer to compress an experience over time into a single spatial moment is essential. Remove this component, and motion through Lissitzky's exhibition room becomes simply a series of viewpoints around a static collection of three-dimensional objects.

In itself this analysis of the *Proun* room would seem to lend credence to an interpretation of Lissitzky's work based simply on relative motion. Yet in comparison with similar Futurist attempts to depict motion, both in sculpture and in painting, Lissitzky's motives are essentially different. Whether trains, aeroplanes, automobiles or the human figure, the objects of Futurist painting necessarily appear as a locus of motion within the canvas. Like a photograph taken under stroboscopic light, their images flicker across the canvas in a multitude of images. Actual motion through space is depicted in a way that presents much more of a challenge to the fabric of time than of space.

'The Italian Futurists have caught the vibrations of quickly moving bodies flitting back and forth in space. . . . These are irrationally transposed and concretized oscillograms of speed and dynamism. Such an approach is quite unsatisfactory. The attempt is to create motion by motion.'⁹³

In contrast to the ambiguous viewpoints of *Proun*, the observer in the Futurist painting remains static while the object of the painting is brought into motion.⁹⁴ In terms of the formal qualities of the painting, this distinction might perhaps appear insubstantial and yet in terms of their subject and spatial effect it is abundantly clear. The *Proun* object remains stationary. It is the *still* life around which the observer must move:

'... the viewer must circle like a planet round the picture which remains immobile in the centre.'⁹⁵

To form the image, views from above, below and all sides are spliced together to form a single perception. This is a compounding not of time, but of space within space; by forcing separate views to occupy the same location, the relationships presented between the component perspectives become impossible to resolve. In the form of the Futurist painting there is almost always an identifiable locus of movement, but in *Proun* there is seldom any. In consequence, the object may appear to take on a new dimension that, while defying our usual understanding of space, nevertheless allows these contradictory positions to coexist. This multidimensional view can be seen as the complete description of the object compiled in an image as it might be compiled in the mind, from a visual survey of its form.

'The first form designed to "pull in" a person coming from the great hall is placed diagonally, "directing" the visitor towards the large horizontal of the front wall, and from there to wall No.3 with a vertical. At the exit – STOP ! i.e., a square at the bottom – the basic element of all design. A relief on the ceiling, placed within the same visual angle, repeats this movement.'⁹⁶

Thus the stationary walls of Lissitzky's interior present their multifaceted view to the observer; like the object of a Cubist painting the low relief of their surfaces keeps the axes of rotation in their changing image tight against the surface of the wall. By providing minimal articulation, Lissitzky forces the objects to remain almost stationary, allowing the movement of the observer to reveal only a very

slight variation in view. The objects are thus in a position to interfere with the existing boundaries of the space; the walls that describe its volume become an ever-changing form, continuously defining and redefining the space. Lissitzky's achievement was thus to utilize movement in the observer as a basis for spatial cognition. Unlike the Futurists, it is not movement *per se* that appears to concern him, but rather the possibility of creating new spatial relationships in the mind of the observer:

'Well in the same way that we draw the perspective of a three-dimensional figure on a plane, so we can draw that of a four-dimensional figure on a canvas of three. . . . We can easily represent to ourselves these perspectives, since they are of only three dimensions. Imagine the different perspectives of one and the same object to occur in succession. . . . There is nothing, then, to prevent us from imagining that these operations are combined according to any law we choose – for instance, by forming a group with the same structure as that of the movements of an invariable four-dimensional solid.'⁹⁷

It is an illusion of course, but given its technical similarity with the geometric features of the hypercube, it is not unreasonable to describe it as an illusion of four-dimensionality in the same way that an axonometric of a cube is an illusion of three-dimensionality. If we accept Poincaré's conclusions, then we do not in any case *represent* solid objects to ourselves directly in geometrical terms. The sensations we receive from the real

world cannot, Poincaré contended provide the experience of geometrical space. Rather, he suggested, we *reason* about objects as if they were their abstract geometrical counterparts. Thus, accordingly, Lissitzky affirmed that it is not possible to apprehend multidimensional geometry directly:⁹⁸

'We can only change the form of our physical space but not its structure, i.e. its three-dimensionality. . . . Only a mirage may be capable of giving us such an illusion.'⁹⁹

Lissitzky's work should not, however, be regarded as a piece of synthetic geometry, nor as a mathematical diagram in artistic guise, but rather as an interactive mechanism designed to disrupt spatial cognition – to allude as it were to the imaginary experience of alternative geometries. We may thus consider his work comparable to efforts made by Hinton, Poincaré and others to envisage the sensory effects of inhabiting different kinds of geometrical space. In this respect, the illusionistic ambiguity that axonometry gave to Stringham's diagram is more significant than its mathematical correctness, because it is this that is responsible for the impression of four-dimensionality. Lissitzky's *Proun* is an architecture of illusion – illusion, that is, in the sense that it remains essentially pictorial, even when it is translated into three dimensions.

'The painter's canvas was too limited for me. The connoisseur's range of colour harmonies was too restricted; and I created the *Proun* as interchange station between painting and architecture.'¹⁰⁰

'We begin our work on the two-dimensional surface, we then pass onto the three-dimensional model constructions and to the needs of life. . . . Through *Proun* we have now come to architecture – which is not accidental.'¹⁰¹

Notes and references

This paper is derived from studies undertaken at the University of Westminster; the original dissertation was awarded a RIBA President's Medal.

1. El Lissitzky, *K. und Pangeometrie (A. and Pangeometry)* (Europa Almanach, 1925), trans. Eric Dluhosch in *Russia: An Architecture For World Revolution* (MIT Press, Cambridge, MA, 1984). In this essay, for reasons that are not entirely clear, Lissitzky chose to abbreviate Art to A. and Form to F.
2. Analytic geometry is geometry carried out through the manipulation of algebraic expressions, as distinct from synthetic geometry, which deals directly with the features of the figure under investigation.
3. In regard to this study, it is important to distinguish between the Euclidean fourth spatial dimension and the non-Euclidean four-dimensional space-time of relativity theory. The distinction is quite straightforward: a fourth spatial dimension is a direction identical to the other three, while in Einstein's continuum the effects of relative speeds and time (which may cause space to distort) are handled as a fourth variable in a non-Euclidean manifold. This mathematical model (included in Einstein's General Theory of Relativity in 1916) was essentially based on Georg Riemann's very flexible view of geometry, in which the actual curvature of the geometry is allowed to vary. In this four-dimensional manifold, curvature is mutable, and may therefore be treated as a fourth coordinate that represents time in relation to the curvature of space. Henderson, *The Fourth Dimension*, pp. 5, 356–358.
4. Unlike relativity theory, the spatial effects of which are by no means part of local experience. Indeed, the first experiment to verify Einstein's hypothesis that light could be deflected by a large gravitational field was carried out by measuring the degree to which the path of light from a distant star was bent around the sun. See Harry Robin, *The Scientific Image: From Cave to Computer*, (Harry N. Abrams, New York, 1992), pp. 194–195.
5. Linda Dalrymple Henderson offers a comprehensive account of the fourth dimension, its history, and the many theoretical treatises written by artists, philosophers and mathematicians on this subject, in *The Fourth Dimension and Non-Euclidean Geometry In Modern Art*, (Princeton University Press, New Jersey, 1983).
6. The mathematics of four-dimensional space is part of a universal *n*-dimensional geometry. Outline explanations of this discipline can be found in many publications including: Martin Gardner, *Mathematical Carnival* (Alfred A. Knopf Inc., 1975), reprinted (Pelican Books, 1982), pp. 41–53; also Phillip J. Davis and Reuben Hersh, *The Mathematical Experience*, (Birkhäuser, Boston, 1980).

7. Gardner, *Mathematical Carnival*, pp. 42–43.
8. I use the term *fourth dimension*, here to refer generally to the body of theoretical work, both mathematical and philosophical, that this notion inspired.
9. See note 3.
10. The letter n stands for any positive integer.
11. Arthur Cayley, 'Chapters in the analytical geometry of n -dimensions, (*Cambridge Mathematical Journal*, 1843), cited in Henderson, *The Fourth Dimension*, pp. 6–7; also Carl Boyer, *A History of Mathematics* (John Wiley & Sons, 1968).
12. This particular version of Euclid's five postulates comes from Davis and Hersh, *The Mathematical Experience*, pp. 217–218.
13. *Ibid.* p. 219.
14. Robin Evans, *The Projective Cast: Architecture and its Three Geometries* (MIT Press, Cambridge, MA, 1995), p. 62.
15. Carl Boyer, *A History of Mathematics*; also Daniel Bell, *Men of Mathematics* (Simon & Schuster, 1965); and Henderson, *The Fourth Dimension*, pp. 3–4.
16. Henderson, *The Fourth Dimension*, pp. 4–5.
17. *Ibid.* p. 5.
18. *Ibid.*, pp. 10–17. Henderson also discusses the availability of Poincaré's text in Russian translation, pp. 242–244.
19. *Ibid.* pp. ix–xxiii.
20. Manuel Corrada, 'On some vistas disclosed by mathematics to the russian avant-garde: geometry, El Lissitzky and Gabo', (Leonardo, **25**, 1992). Reprinted in Michele Emmer, (ed.) *The Visual Mind: Art and Mathematics*, (MIT Press, Cambridge MA, 1993), p. 235. Also Patricia Railing, *More About Two Squares*, (Artists Bookworks, Sussex, 1990), p. 14.
21. Corrada, 'On some vistas . . .', p. 235.
22. This suggestion is supported by Lissitzky's text, *Rußland, Die Rekonstruktion der Architectur in der Sowjetunion* (Verlag Anton Schroll & Co., Vienna, 1930), translated by Eric Dluhosch in *Russia: An Architecture for World Revolution*, (MIT Press, Cambridge, MA, 1970).
23. Railing, *More About Two Squares*, p. 4. The programme at *UNOVIS* is also discussed by Railing in, *From Science to Systems of Art*, (Artists Bookworks, Sussex, 1989), pp. 53–57.
24. El Lissitzky, *Suprematism in World Reconstruction*, 1920. Typescript from the Lissitzky archive, translated in Sophie Lissitzky-Küppers, *El Lissitzky: Life, Letters, Texts*, (Thames and Hudson, London, 1968). reprinted 1992, p. 331.
25. El Lissitzky, *A. and Pangeometry*, pp. 142–149.
26. Corrada, 'On some vistas', pp. 235, 237. See also El Lissitzky, *A. and Pangeometry*, pp. 143–144. This aspect of Lissitzky's text is analysed by Yve-Alain Bois in 'From $-\infty$ to 0 to $+\infty$, axonometry or Lissitzky's mathematical paradigm' in *El Lissitzky, 1890–1941, Architect, Painter, Photographer, Typographer* (Municipal van Abbemuseum, Eindhoven, 1990), pp. 29–31.
27. El Lissitzky, *A. and Pangeometry*, p. 143. Lissitzky is mistaken in thinking that perspective is based on Euclidean geometry. Perspective is not in itself inherently Euclidean. See Evans, *The Projective Cast*, p. 62.

28. El Lissitzky, *A. and Pangeometry*, p. 144.
29. *Ibid.*
30. The word *development* is used here in the sense in which it is used in geometry and technical drawing to mean the folding out of a surface into a flat plane.
31. Presumably gained during his education in architecture and engineering. See Sophie Lissitzky-Küppers, *El Lissitzky: Life, Letters, Texts* (Thames and Hudson, London, 1968, reprinted 1992), p. 19.
32. Poincaré's major works were undoubtedly available in Russian translation, and would probably have been a major source of mathematical theory to non-mathematicians in Russia. Poet Velimir Khlebnikov (a friend of Malevich) mentions Poincaré's, *Science and Hypothesis* in a letter to Matyushin. Poincaré's essays on space perception were also included in Alexander Vasiliev's anthology, *Novye idei v Matematike* (St Petersburg, 1913). Both cited in Henderson, *The Fourth Dimension*, pp. 241–243.
33. Henri Poincaré, *Science and Hypothesis*, (translated Walter Scott Publishing Co., 1905, reprinted Dover, New York, 1952). From his work on the foundations of topology, Poincaré eventually concluded that space was limited to three dimensions. See Henderson, *The Fourth Dimension*, p. 38.
34. Poincaré, *Science and Hypothesis*, pp. 54–55.
35. Poincaré, *Science and Hypothesis*, 'Visual space', pp. 52–55; Tactile and motor space, pp. 55–56.
36. *Ibid.* p. 70.
37. *Ibid.* p. 50.
38. *Ibid.* p. 70.
39. Henderson, *The Fourth Dimension*, p. 37; Poincaré, *Science and Hypothesis*; Helmholtz, *On the Origins and Significance of Geometrical Axioms*, (1870).
40. Henri Poincaré, *La Valeur de la Science*, (1904), translation quoted in Henderson, *The Fourth Dimension*, p. 38.
41. Henri Poincaré, *Science et Méthode*, translated in Henderson, *The Fourth Dimension*, p. 38.
42. Poincaré, *Science and Hypothesis*, p. 51.
43. Charles Hinton, *A New Era of Thought*, (Swan Sonnenschein & Co., 1888; reprinted 1900); *The Fourth Dimension* (Swan Sonnenschein & Co., 1904; reprinted 1906).
44. Hinton, *The Fourth Dimension*, 'The simplest four-dimensional solid', pp. 157–177.
45. Hinton, *A New Era of Thought*.
46. *Ibid.* Part II, Appendix K.
47. Hinton, *The Fourth Dimension*, 'Nomenclature and analogies, preliminary to the study of four-dimensional figures', pp. 136–156, 'The simplest four-dimensional solid', pp. 172–177.
48. Hinton, *A New Era of Thought*, pp. 86–87.
49. See for example 'L'évolution de l'architecture moderne en Hollande, (*L'Architecture Vivante*, 1925); previously published in *De Stijl* as 'Tot een beeldende architectuur' (Towards a plastic architecture). Cited in Henderson, *The Fourth Dimension*, pp. 323–324.
50. As Linda Henderson points out, Hinton's books were translated into Russian in 1915. Even before this time however, Hinton's ideas are

- evident in Petr Demianovich Uspensky's book, *The Fourth Dimension*, published in 1909. Note: In some translations Uspensky is spelt Ouspensky and also Uspenskii.
51. Petr Demianovich Uspensky, *Chetvertoe Izmerenie: Opyt Izsledovaniia Oblasti Neizmerimago*, (*The Fourth Dimension: An Experiment in the Examination of the Realm of the Immeasurable*) (1909). Cited in Henderson, *The Fourth Dimension*, pp. 245–249, also Patricia Railing, *On Suprematism, 34 Drawings*, (Artists Bookworks, Sussex, 1990), pp. 34–35.
 52. Kasimir Malevich, 'The philosophy of the kaleidoscope', (1922). Translated in *The World As Non-Objectivity, Unpublished writings, 1922–25*, (Borgens Forlag, 1976), p. 33.
 53. 0.10, Last Futurist Exhibition, December 1915–January 1916. Included in the paintings exhibited by Malevich: *Painterly Realism of a Football Player – Colour Masses in the Fourth Dimension; Painterly Realism, Boy With Knapsack – Colour Masses in the Fourth Dimension; Movement of Painterly Masses in the Fourth Dimension; Automobile and Lady – Colour Masses in the Fourth Dimension; Lady – Colour Masses in the Fourth and Second Dimension*.
 54. El Lissitzky, 'New Russian Art' (1922), transcript from the Lissitzky archive, Moscow. Translated in Sophie Lissitzky-Küppers, *El Lissitzky*, p. 338.
 55. El Lissitzky, *A. and Pangeometry*, p. 144.
 56. Hinton, *The Fourth Dimension*, p. 156. The analogy used by Hinton is that of a sloping piece of string passing through the plane world.
 57. Hinton, *Ibid.* pp. 178ff.
 58. It has been noted that for the exhibition 0.10, Malevich distinguished between *colour masses in two dimensions* and *colour masses in the fourth dimension* on the basis of whether a single or multiple colours appeared on the canvas. The difference in colour is considered, it would seem, to be the generator of four-dimensional space. Railing, *On Suprematism*, p. 28.
 59. El Lissitzky, *A. and Pangeometry*, p. 145.
 60. The word *axonometric* is used here and elsewhere in this study to refer generally to the range of related parallel projections that include isometric and oblique.
 61. Poincaré, *Science and Hypothesis*.
 62. *Ibid.* pp. 54–55.
 63. El Lissitzky, 'Proun, not world visions, BUT – world reality', (*De Stijl* V (1922), No.6); Translated in Lissitzky-Küppers, *El Lissitzky*, p. 348.
 64. El Lissitzky, *A. and Pangeometry*, p. 145; Yve-Alain Bois discusses this aspect of *A. and Pangeometry* in 'From $-\infty$ to 0 to $+\infty$ ', p. 32.
 65. Without reference to the fourth dimension, Yve-Alain Bois notes this feature of paintings by Lissitzky and van Doesburg in 'Metamorphosis of Axonometry', *Daidalos* (1981), No.1).
 66. El Lissitzky, 'Element and Invention', *ABC – Beiträge zum Bauen* Basle, (1924), No.1; translated in Lissitzky-Küppers, *El Lissitzky*, p. 349.
 67. W. I. Stringham, 'On regular figures in n -dimensional space', (*American Journal of Mathematics* (1880), III, pp. 1–12).
 68. It should be noted that the vanishing point is a product either of defining a rectangular

- space in perspective, or of certain methods for perspective projection (see Evans, *The Projective Cast*, pp. 123–177) and does not therefore necessarily appear in a perspective image but is nevertheless a perspective representation of infinity.
69. El Lissitzky, 'New Russian art: a lecture', (1922). Typescript from the Lissitzky archive, Moscow. Translated in Lissitzky-Küppers, *El Lissitzky*, p. 338.
 70. Bois, 'Metamorphosis of axonometry', p. 46 and From $-\infty$ to 0 to $+\infty$, op. cit., pp. 29-30.
 71. Evans, *The Projective Cast*, pp. 62, 124–125.
 72. Euclid, *Elements*, Definition 23, quoted in Davis and Hersh, *The Mathematical Experience*, p. 19.
 73. El Lissitzky, *A. and Pangeometry*, illustrated in Lissitzky-Küppers, *El Lissitzky*, p. 354.
 74. *Ibid.* p. 145. The significance of this diagram is discussed by Yve-Alain Bois in 'From $-\infty$ to 0 to $+\infty$ ', p. 44.
 75. The perspective image stands in place of the object from a particular viewpoint. It is also therefore, by its very nature, an incomplete description of the object.
 76. El Lissitzky, *A. and Pangeometry*, p. 146.
 77. El Lissitzky, 'Architecture in the USSR', *Das Kunstblatt*, (1925) No.2, Feb., translated in Lissitzky-Küppers, *El Lissitzky*, p. 372. This interpretation of Lissitzky's *Proun* paintings is suggested by Joost Baljeu in '*The New Space in the painting of El Lissitzky*' (essay in catalogue of the El Lissitzky exhibition held in Eindhoven, 1966). reprinted in Lissitzky-Küppers, *El Lissitzky*, p. 390.
 78. Stringham, 'On regular figures', Plate I.
 79. Bois, 'Metamorphosis of axonometry', p. 46.
 80. *Ibid.* p. 56.
 81. Bois observes this aspect of the *Proun* paintings in 'From $-\infty$ to 0 to $+\infty$ ', p. 31.
 82. Ernst Gombrich describes a similar tendency in Cubism. Its ambiguous figures, he claims, repeatedly trigger spatial recognition but resist any test of consistency: '... each hypothesis we assume will be knocked out by a contradiction elsewhere, so that our interpretation will never come to rest and our imative faculty will be kept busy as long as we join the game.' Gombrich, *Art and Illusion, A Study in the Psychology of Pictorial Representation*, (Phaidon Press, London, 1960), p. 240.
 83. *Ibid.* pp. 240–241. It should be noted that Linda Henderson identifies Cubism with the type of four-dimensional projections used by Stringham.
 84. *Ibid.* p. 241. In psychology this phenomenon is characterized by Thiery's figure, which contains the essential components of this type of ambiguity.
 85. El Lissitzky, design for the second exhibition room, Niedersächsische Landesgalerie, Hannover, 1927–8. Without reference to the fourth dimension, Yve-Alain Bois also discusses the reversibility of this drawing: 'From $-\infty$ to 0 to $+\infty$ ', p. 31; Robin Evans notes an equivalent similarity between Stringham's diagram and Lissitzky's drawing of the *Proun* room (Berlin, 1923); *The Projective Cast*, pp. 342–343.
 86. Patricia Railing describes a similar tension between the elements in Malevich's paintings:

- More About Two Squares*, p. 28; Joost Baljeu describes the space caught between surfaces: 'The New Space in the Painting of El Lissitzky', pp. 391-392.
87. El Lissitzky, *Proun* room, designed for the Berlin Art Exhibition, 1923.
88. El Lissitzky, 'Proun space, the great Berlin Art Exhibition of 1923', from Gräff and Lissitzky (eds), *G1*, (H. Richter, Berlin, 1923); trans. Dluhosch in *Russia: An Architecture for World Revolution*, p. 139.
89. El Lissitzky, *Proun* space, p. 139.
90. This feature of the *Proun* room is observed by Corrada, 'On some vistas', p. 239.
91. This diagram appeared in, amongst other articles, 'L'évolution de l'architecture moderne en Hollande', (*L'Architecture vivante*, 1925). See Henderson, *The Fourth Dimension*, p. 324.
92. Hinton, *The Fourth Dimension*.
93. El Lissitzky, *A. and Pangeometry*, p. 147.
94. It is important to distinguish here between the dynamic equilibrium of Suprematist compositions, which (as discussed earlier in the context of Lissitzky and Malevich's work) uses the *posture* of the figures to indicate dynamism, and the Futurist technique of depicting the locus of a specific motion.
95. El Lissitzky, *Suprematism in World Reconstruction*, p. 332.
96. El Lissitzky, 'Proun space', p. 139.
97. Poincaré, *Science and Hypothesis*, p. 69.
98. Poincaré, *Science and Hypothesis*, p. 56-57; El Lissitzky, *A. and Pangeometry*, p. 146.
99. El Lissitzky, *A. and Pangeometry*, p. 146
100. El Lissitzky, 'The Film of El's Life' (1928) Transcript from the Lissitzky archive, Moscow. Translated on Lissitzky-Küpper, *El Lissitzky*, p. 329.
101. El Lissitzky, *Prouns*, (1921), in *El Lissitzky* (Galerie Gmurzynska, Cologne, 1976); quoted in Bois, 'From $-\infty$ to 0 to $+\infty$ ', p. 33.

Complexities

Reinhold Martin

This essay considers the interaction of architectural theory and recent scientific developments in complexity theory and the study of self-organising systems, beginning with a reading of biologist Stuart Kauffman's popular exposition of his own work and that of others in the field in *At Home in the Universe: The Search for the Laws of Self-Organization and Complexity*. Kauffman's book is seen to rehearse an undertheorised notion of a cosmic 'home' newly identified for humanity by science, arguing that evolutionary processes – including the origin of life itself – previously thought to be unimaginably unlikely or arbitrary are now understood as probable effects of the spontaneous emergence of order out of chaos. Significantly, Kauffman repeatedly extends his project into other aspects of human endeavour, including technology and society. Making no claims regarding the science itself, this essay argues that the nostalgia for the 'home' made explicit in Kauffman's work renders such attempts at generalising complexity theory, potentially problematic. Kauffman, for example, indulges in a project of uncritical domestication which has its own history within architectural discourse, including Christopher Alexander's attempts to translate earlier discourse on self-organising systems into a comparably restorative architectural formula in the face of an increasingly technologised – and 'complex' – lifeworld. The figure of the cybernetic black box and a fictional 'black cloud' – both contemporaneous with modernist efforts to unite architecture and science – are introduced as complementary materialisations of fully integrated 'communicative organisms' postulated by cybernetics against a background of noise, confusion, and information overload. The essay concludes by proposing that these latter effects be theorised as constitutively unassimilable into any and all universalising gestures of integration and domestication, thereby holding architecture open to the full implications of discourses outside of itself, and vice versa.

'Complexity' is a term with multifarious architectural connotations. It is a term that has apparently succeeded, in the space of 30 years, in detaching itself from 'contradiction' and all of the linguistic conceits attending that association, and reattaching itself to another set of provocations. The new

context for complexity in architecture is given largely by popular science journals, newspaper science features, and semi-journalistic accounts of the achievements of recent scientific research into the spontaneous eruption of order in highly differentiated mathematical, biological, and physical

systems. This seemingly novel association does not issue from a single source. Nor is it propped up by elaborate argumentation or extensive citation. Indeed, it is perhaps most accurate to observe that a scientifically inflected notion of 'complexity' is simply 'in the air' in regions and pockets of architectural discourse stretching across the globe. This is by no means to diminish its significance, since the air in question – that circulating in architectural jury rooms, seminar rooms, lecture halls, and related venues – is an often-overlooked medium of discourse where conceptual leaps are wont to occur. In this instance, however, it becomes rapidly apparent that the rush back to science carries with it both promises and perils, built on invitations issuing from scientific precincts to generalise without translating, and to take refuge from uncertainty in ahistorical positivity.

Although 'complexity' has thus become something of an imperative in various strains of contemporary architectural production, the resulting work and its theoretical claims ultimately remain somewhat beside the point in this instance. Instead, the issue at hand involves a set of expectations surrounding the identity of architecture itself, discernible both in historical encounters between architecture and science and in recent scientific popularisations of complexity theory alike. Indeed, the latter frequently rehearse a quality that architecture has historically integrated into its very being: the capacity (or incapacity) to provide a home, and to instantiate a form of interiority that, once and for all, keeps the threatening clouds of noise and confusion permeating a denaturalised present at bay.

Homecomings

'Here is no mere scientific search. Here is a mystical longing, a sacred core first sought around that small campfire sometime in the past 3 million years. This way lies the search for our roots. If we are, in ways we do not yet see, natural expressions of matter and energy coupled together in nonequilibrium systems, if life in its abundance were bound to arise, not as an incalculably improbable accident, but as an expected fulfillment of the natural order, then we truly are at home in the universe.'¹

These are the words of theoretical biologist Stuart Kauffman, arguably the most articulate and systematic expositor of the new sciences of 'complexity' and self-organisation. I shall use Kauffman's work as a case study representative of an expansive literature,² since his *At Home in the Universe* is a recent and compelling example of efforts to make this research accessible to a wide audience of non-specialists, for reasons not only of popularisation, but also of generalisation into broadly applicable principles. In this quotation Kauffman declares his extra-scientific, quasi-metaphysical ambitions: a mythic search for roots, an unqualified naturalism, and an equivalence between the fulfilment of evolutionary destiny and the recovery of the home. Indeed, Kauffman's claims to metaphysical generality rest on an apparent overcoming of modernity's greatest conflict: the advance – or 'evolution' – of the human species through technological productivity, and the attendant machine-like ruthlessness of the evolutionary mechanisms that have been mobilised to explain – and justify – the indifference of nature and human institutions alike, as well as

the arbitrary selection processes characterising the entire procedure. In other words, what is being offered, couched in the language of biology, is an apparent rationale for the implausible, brutal dynamic of history.

Earnestly and continuously, Kauffman repeats his claims as he attempts to convey his comforting message: that life, the preeminent example of what is known technically as 'organised complexity', is fully at *home* within the natural order of things, and not an astronomically improbable accident. In this narrative, condensed already into Kauffman's title, the home is thus deployed as a necessary corollary to life itself. Life, whose history was previously understood as subject almost entirely to the brutal chance mutations underpinning natural selection, has found that it has been at home all along, thanks to the discovery of 'self-organisation', defined by Kauffman as the capacity of a system to reproduce itself and to evolve in the absence of an external impetus.³ While conversely, within a such a universe, governed by laws of what amounts to historical necessity, there can be no life without a home – that is, without a self-organising system.

Under the spell of this domesticating imperative, it is also hardly accidental that Kauffman's first metaphoric invocation of architecture comes in the opening lines of his preface, as he attempts to conjure up the repository of natural legislation controlling the growth and interaction of organisms:

'We live in a world of stunning biological complexity. Molecules of all varieties join a metabolic

dance to make cells. Cells interact with cells to form organisms; organisms interact with organisms to form ecosystems, economies, societies. Where did this grand architecture come from?'⁴

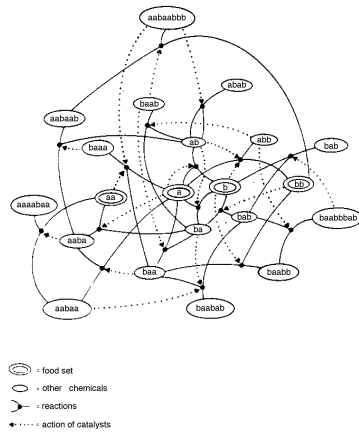
The answer, expressed in mathematical and computer-based models and played out experimentally in the study of artificial life,⁵ is that this 'grand architecture' is evidence of processes of autocatalysis and self-organisation. In Kauffman's universe, the universe of theoretical biology, 'organisation' is a term in use since the early nineteenth century to describe the formation and structure of organisms. Yet that other product of the nineteenth century, Darwinian evolutionism, has remained unable to account for the richness and complexity of living form in the first place. While Kauffman accepts most evolutionist premises he objects vigorously to the apparent arbitrariness of natural selection, exemplified by geneticist Jacques Monod's eloquent characterisation of evolution as 'chance caught on the wing'.⁶ As a supplement, Kauffman proposes a model based on the spontaneous generation of order rather than on the slow, incremental processes of random mutation, selection, and refinement. Key terms are the interactive 'coevolution' of agents in a system and the critical 'edge of chaos' state at which self-organisation occurs, while central to the entire hypothesis is an understanding of the organism as an informational matrix capable of processing great quantities of organisational data, a concept fundamental to much of late twentieth-century biology in general.⁷ According to Kauffman, simple genetic 'programming' would also be insufficient, since

Figure 1. Autocatalytic set. (Diagram from Stuart Kauffman, *At Home in the Universe*, p. 65)

unlike most computer programs, which are fragile with respect to minor variations in code, organisms are robust, protected from catastrophic breakdown due to minor glitches: 'As we shall see, the probable answer to this seeming paradox lies in the fact that the term "genetic program," if it points to anything, points to a parallel-processing genetic regulatory network which can exhibit self-organised buffered behavior.'⁸

It is this sense of a resilient, parallel network of interconnections, interdependences, and influences that provides the most cogent image of Kauffman's model (Fig. 1). Indeed, if popular mythology is to be believed, it may be said that Kauffman's work begins with just such an image. In his ecstatic gloss on contemporary research in complexity and related topics, *Wired* editor Kevin Kelly offers an account of a young Kauffman, then a Dartmouth undergraduate, daydreaming in front of a bookstore window about a book with his name on its spine. The pages of the imagined book are filled with a tangle of criss-crossing and interconnected arrows, from which springs 'an image emerging out of the links in a "subterranean way", just as recognition of a face springs from the crazy disjointed surfaces in a cubist painting.' Kelly's account of Kauffman's subsequent insight into the nature of this 'vision' as a medical student preoccupied with genetics is symptomatic:

'Out of that random mess, Kauffman suddenly felt sure, would come inadvertent order – the architecture of the organism. Out of chaos would come order for no reason: order for free. The complexity



of points and arrows seemed to be generating a *spontaneous order*. To Kauffman the depiction was intimately familiar; it felt like home.'⁹

With this image well in hand, Kauffman reminds us repeatedly that we may be, after all, 'at home in the universe' – not unexpected (and potentially unwelcome) house guests whose existence, form, and productions are subject only to the incalculable whims of chance, but integral members of the natural order and welcome inhabitants of the 'grand architecture', our appearance not only plausible but historically expected. It is exactly at this moment – at the very beginning, that is – that Kauffman's narrative projects science onto history by anticipating the denouement of his book: the

generalisation of the 'laws of self-organisation and complexity' into virtually all aspects of human endeavour. Whence the efforts to utilise these models in economic analysis and forecasting, infrastructure planning, manufacturing and so on currently under way at the Santa Fe Institute and elsewhere. As Kauffman puts it, 'As we shall see, technological evolution may be governed by laws similar to those governing prebiotic chemical evolution and adaptive coevolution', while '[l]ike coevolutionary systems, economic systems link the selfish activities of more or less myopic agents', and melodramatically: 'The edge of chaos may even provide a deep new understanding of the logic of democracy.'¹⁰

It is clear even from this brief description that in his eagerness to universalise his discoveries, Kauffman rather naively takes the restorative properties of the 'home' for granted, as he attempts (both metaphorically and literally) to construct a new and comfortable dwelling for a modern subjectivity besieged for more than a century by scientific remonstrations as to its precarious, unlikely, and marginal position within the great chain of being. The sense of bewilderment and disorientation on which Kauffman plays has its own history, however, as do scientific attempts to overcome it by reaching outside the narrow bands of specialisation. And architecture has regularly shown itself to be a willing participant in such attempted home-comings, with mixed results.

In fact, the history of 'self-organisation' itself contains sufficient traces of architectural efforts to ward off scientifically induced alienation to be worth excerpting. Given the tendency of current

architectural interest in complexity theory to be associated with a resurgent organicism, it is also worth noting that earlier efforts to deal systematically with the bewildering complexity of nature came at a moment when both machines and organisms were already interacting with such mutual élan as to defy any meaningful distinctions between them. In other words the wholeness of the organism – self-organising or otherwise – was already (and is indeed *always* already) under erasure from a sociocultural point of view.¹¹ We cannot but recognise, therefore, the fundamental hybridities, cleavages, and multiple enfoldings this introduces into any effort to proclaim the reclamation of the 'whole' from the fragmented scrapheap of modernity, through attempts to reconcile the natural and the historical under the fully acculturated notion of the home.

Black boxes

For example, by the early 1950s Walter Gropius was campaigning for architecture as a humanising complement to the menacing abstractions of modern science. At that same moment, nuclear physicist J. Robert Oppenheimer was campaigning for the humanistic integration of scientists into affairs of culture in the interest of averting further atomic catastrophe.¹² In a text published three times, and presented originally as a public lecture at the RIBA, Gropius put it thus:

'The vast development of science has thrown us out of balance. Science has overshadowed other components which are indispensable to the harmony of life. This balance must be re-established.

What we obviously need is a reorientation on the cultural level.¹³

By the time of its publication under Gropius's name, this argument was already a familiar refrain in modernist discourse. Among its previous enunciators were his friend László Moholy-Nagy, referring to 'confusion around science' in *Vision in Motion* (1947), a formulation already converted by Moholy's colleague Gyorgy Kepes into a call for the unity of the arts and sciences in *Language of Vision* (1944), repeated by Siegfried Giedion in *Mechanisation Takes Command* (1948), and taken up by Gropius shortly thereafter. Although the personal and institutional affiliations amongst these figures were manifest, their common phraseology during the 1940s and into the 1950s marks a decisive offset in the trajectory of the alliance between architecture and scientific rhetoric forged monumentally by Giedion in *Space, Time and Architecture* of 1941. Though the ambiguities and misconceptions plaguing numerous efforts such as Giedion's to draw parallels between early twentieth-century physics and modernist aesthetics have been well documented,¹⁴ this new rhetoric of the war years and postwar period signalled a deeper disjunction. Where before the war the mysteries and enchantments of modern physics could be invoked in the name of openness, after Hiroshima they would inevitably bear the mark of domination (Fig. 2). In the words of Oppenheimer:

'Despite the vision and the far-seeing wisdom of our wartime heads of state, the physicists felt a peculiarly intimate responsibility for suggesting, for

supporting, and in the end, in large measure, for achieving the realisation of atomic weapons. Nor can we forget that these weapons, as they were in fact used, dramatized so mercilessly the inhumanity and evil of modern war.'¹⁵

Drawing on his experiences in the interdisciplinary community in the American Cambridge, Giedion in his 1948 history of mechanisation sought to temper the heroic flux of space-time with more balanced terms such as 'equipoise' and 'dynamic equilibrium', which Gropius would rapidly assimilate into his own writings, in an effort to regulate the dynamo of progress without damping its momentum. In referring to physiologist Walter B. Cannon's work on the body's ability to regulate its internal state and maintain equilibrium under duress – a process known as homeostasis – as an antidote to the shock of Hiroshima, Giedion invokes a theme common in efforts to treat science as a source of both social and cultural stability and ever-advancing progress, able to control its own destabilising effects through a kind of internal feedback mechanism.¹⁶

Homeostasis was also an important term in early cybernetic discourse and a key component of what mathematician and originator of cybernetics Norbert Wiener characterised as 'the organism seen as a message'. For Wiener, 'organism is opposed to chaos, to disintegration, to death, as message is to noise.' In other words, organisms are organised patterns of data set against the entropic stream of corruption and decay, maintained and regulated through homeostatic processes.¹⁷ And just as the organism has lent itself readily to architecture as a

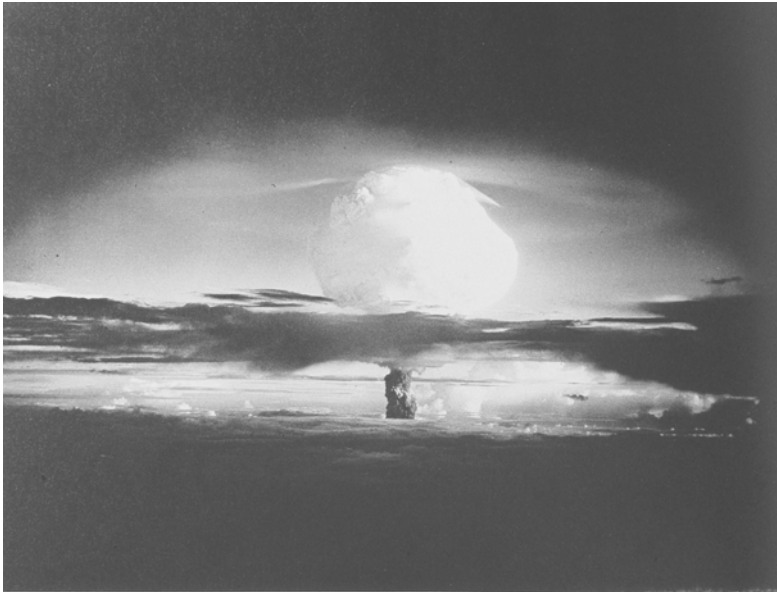


Figure 2. H.E. Edgerton, K.J. Garmeshausen and H.E. Grier, thermonuclear bomb explosion, Eniwetok Atoll, 1 November 1952. (Source: John Darius, *Beyond Vision*, p. 97)

figure of wholeness and continuity for centuries, so was homeostasis readily adaptable into a general principle of dynamic cultural and technological stability, as Giedion had implied.

Almost at its inception, cybernetic thinking insinuated itself into postwar architectural thought through a number of channels. One of these was the work of Kepes, who was an early reader of the cybernetic literature and cited the published

proceedings of foundational colloquia devoted to the interdisciplinary generalisation of cybernetic methods, while listing a wide range of examples of homeostatic processes to accompany these words:

'We ourselves are self-regulating systems; when we put out our hand for an apple, our movement sends back to us a continuous indication

of where we are; similarly to the guided missile, we continuously correct for error as we seek our destination.¹⁸

In 1963, on the recommendation of Rudolf Arnheim, Kepes was asked by the editors of Harvard University Press to review a manuscript then being considered for publication, written by the young Christopher Alexander. Kepes responded favourably and Alexander's text was published as *Notes on the Synthesis of Form* in 1964.¹⁹ This was Alexander's first in a series of attempts to reduce the production of form to a set of algorithms based on the logic of information theory and employing its rhetoric, executable on the mainframe computers for which he and his colleagues at MIT were writing programs in the early 1960s. In the name of 'good fit' to a pre-existing context and a design process emulating the architect-free 'unselfconscious process' of pre-modern societies, Alexander's proposition was as follows:

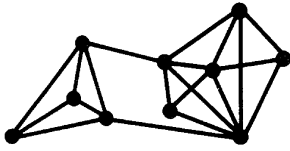
'Roughly speaking, I shall argue that the unself-conscious process has a structure that makes it homoeostatic (self-organising), and that it therefore consistently produces well-fitting forms, even in the face of change. And I shall argue that in a self-conscious culture the homoeostatic structure of the process is broken down, so that the production of forms that fail to fit their contexts is not only possible, but likely.'²⁰

Although Alexander's reference to self-organising processes lacks the drama later accorded the term by Kauffman and others and is based on much

earlier work, the sense is clear. For Alexander, self-organisation – that is, the apparently de-politicised, automatic and 'natural' formation of social structures and their corresponding spatialisations – was a virtue belonging to supposedly 'unselfconscious' primitive societies, a virtue accessible to modern subjectivity only as a digital simulacrum.

By the time Alexander wrote these lines an entire field of study devoted to self-organisation had coalesced at the intersection of mathematics, biology, and information theory. Alexander was fully aware of this, citing – in the footnote accompanying the above quotation – the published proceedings to an important 1959 interdisciplinary conference on 'Self-Organising Systems', alongside Cannon's *The Wisdom of the Body* (1932), cyberneticist W. Ross Ashby's *Design for a Brain* (1960), and an article by Heinz von Foerster on homeostatic mechanisms. At the 1959 event, participants were greeted with 'Good morning, self-organising systems!' by Dr Joachim Weyl of the Office of Naval Research (which had cosponsored the colloquium), a greeting that made clear the anthropological ambitions of the theory reported to artists and architects by Kepes several years earlier.²¹ Likewise, as the later work on self-organisation was to do with abandon, Alexander sought to model these life systems in the binary languages of programming code, appending to his book examples one step away from implementation as computer-modelled, naturally evolving ecologies.

If Alexander's presumptions seem a far cry from the meditations on architecture and science by Gropius *et al* that prepared the ground for them, the two should not be seen as entirely antagonistic.



Instead of offering up a humanistically inflected architecture to control the alienating effects of science, Alexander, like many humanists of the 1960s, actively displaced anything that Gropius would have recognised as ‘architecture’ – and especially the figure of the architect or planner – in favour of a self-sustaining feedback loop: environmental data are input into a system according to the principle of ‘good fit’, and ‘patterns’ are output. The role of the architect is to design the network (Fig. 3). As Alexander puts it, citing D’Arcy Wentworth Thompson: ‘Once we have the diagram of forces in the literal sense (that is, the field description of the context), this will in essence also describe the form as a complementary diagram of forces’, in which case there would be no design problem, since the problem arises in generating ‘a diagram for forces whose field we do not understand.’²² This is all in response to the growing complexity of problems in environmental design, mapped along a multitude of performative axes in which no one factor (e.g. economy, function, etc.) can be accorded primacy:

‘Today more and more and more design problems are reaching insoluble levels of complexity. This is true not only of moon bases, factories, and radio receivers, whose complexity is internal, but even of

villages and tea kettles. In spite of their superficial simplicity, even these problems have a background of needs and activities which is becoming too complex to grasp intuitively.’²³

But again it was Gropius who already in 1954 had asked ‘Is there a science of design?’ His answer was ambivalent, reasserting the intuitive dimension that Alexander would seek to banish, but offering up contemporaneous research in optical perception that also caught the attention of people such as Kepes (whom Gropius mentions) and, in a related way, Arnheim.²⁴ A visual faculty calibrated to changing environmental conditions had long been classed among the ‘biological needs’ serviced by a functional modern architecture,²⁵ and thus those invested in the latter were receptive to new developments in the perceptual and cognitive sciences. One telling postwar example is given in Giedion’s response to the demonstrations of the contingency of visual form presented by Adelbert Ames of the Hanover Institute in 1947, at Princeton University’s bicentennial symposium on ‘Man and his Physical Environment’. Referring to a collection of sticks that from one viewpoint only assemble into what looks like a chair, Giedion reminds us that:

‘What the “eye perceives” can be a chair, but it may also turn out that this chair is nothing but a few sticks hovering in mid-air. The modern artist has forever overthrown the belief that what the eye sees is reality. He carried to its consequences what Mr. Ames showed us with his particle chair. But he has transplanted it into another sphere, the emotional.’²⁶

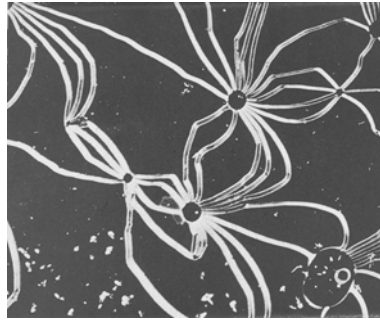
Figure 3. Christopher Alexander, diagram of interdependent variables in a design problem. (Notes on the Synthesis of Form, p. 64)

Figure 4. Dr O. Lehmann, liquid crystals, photomicrograph. (In Gyorgy Kepes, *The New Landscape in Art and Science*, p. 146)

These remarks confirm Giedion's commitment to the epistemological innovations of modern painting, but seen in terms of the perceiving subject in relation to his/her 'environment' that was the subtext of the symposium and a major pre-occupation of the period, they also point towards a discontinuity irritating many who, like Alexander, were concerned with the production of that environment: the unstable and contingent relation between subject and object. Several decades earlier, the modern overthrow of traditional form-making processes was said to be compensated for by what Moholy-Nagy called a 'new vision', biologically adapted to modernity's flux and capable of processing ever-accelerating flows of visual information. But by the early 1960s the evolutionary success of the new vision was in doubt. As Alexander put it:

'Bewildered, the form-maker stands alone. He has to make clearly conceived forms without the possibility of trial and error over time. He has to be encouraged now to think his task through from the beginning, and to "create" the form he is concerned with, for what once took many generations of gradual development is now attempted by a single individual. But the burden of a thousand years falls heavily on one man's shoulders, and this burden has not yet materially been lightened. The intuitive resolution of contemporary design problems simply lies beyond a single individual's grasp.'²⁷

Consequently, with Alexander's work the perceptual studies of the 1940s and 1950s were assim-



lated into the rationalisation of social interaction during the 1960s, thanks in large measure to cybernetics. His project also had strong roots in Kepes, not only because of the latter's patronage, but in his celebration of the sciences as a source of inspiration. Kepes's *The New Landscape in Art and Science* (1956) included numerous texts by prominent scientists – including Norbert Wiener – while vigorously and elegantly campaigning for the network-laced images generated by modern science as a source of organisational principles applicable to architecture and art (Fig. 4). In looking to scientific rationality as a replacement for an inadequate intuitive faculty, Alexander flattens out Kepes's indefatigable romanticism, while extracting mathematical networks from rural villages (Fig. 5) as artificially naturalised as Kepes's scientifically photographed natural forms in order to impose them on an unwitting modernity. Along the same lines, the apparent marginality of Alexander's



discourse to today's preoccupations must be seen ironically as an index of their actual proximity. As an extreme manifestation of the integration of cybernetic themes his proposals are only too transparent in their instrumentality, even as they introduce premisses that are preserved to this day in the 'synthesis of form': displace the author, make a diagram, let the algorithm play itself out, etc. In other words, the two – Alexander's positivism and today's computer-based formalisms of 'multiplicity' – are exactly complementary, two sides of the coin of systematisation.

With Alexander's early work we can also see in especially uncompromised form the confluence of a feedback-oriented mathematics of spatial patterns and a set of assumptions regarding the 'fit' of humans to their environment drawn from behavioural psychology. This too is fully consonant with wider developments. Not only did behaviouristic postulates become almost a necessary prerequisite to various forms of social planning during the 1960s with decided impact on architecture and urbanism; cybernetics itself was at its inception formulated in terms of behavioural psy-

chology, which was used to convert the actions of a technologised enemy 'other' into error-correcting feedback in the original wartime research on anti-aircraft firing mechanisms, as has been shown by Peter Galison.²⁸ In an important early paper entitled 'Behavior, purpose and teleology' Norbert Wiener and his colleagues Arturo Rosenblueth and Julian Bigelow put it like this:

'Given any object, relatively abstracted from its surroundings for study, the behavioristic approach consists in the examination of the output of the object and of the relations of this output to the input, without regard to the "intrinsic organisation of the object.".'²⁹

In this respect, perhaps the most telling synthesis of autoregulation and behaviourism was the figure of the behavioural 'black box' – an entity somewhere between a machine and organism whose inner workings could not be known, but whose behaviour could in theory be studied and described systematically in terms of input and output. The prototypical 'black boxes' were the electronic instruments in use for wartime research in sites such as the Radiation Laboratory at MIT, although the figure was quickly generalised to include any device with an unspecified interior. And since cybernetics did not differentiate between the mechanical and the organic, it was fully logical to extend the descriptor to human beings.

Methodologically, the behaviouristic study of 'black boxes' was opposed to the functionalist study of organisms and devices – real or hypothetical – whose inner workings were known to

Figure 5. Christopher Alexander, diagram for the reorganisation of an agricultural village in rural India. (From *Notes on the Synthesis of Form*, p. 173)

determine their actions. As such, the 'black box' was a problem solely of input and output generalisable to the everyday lifeworld. In the words of W. Ross Ashby in his *Introduction to Cybernetics* (1956):

'The child who tries to open a door has to manipulate the handle (input) so as to produce the desired movement at the latch (the output); and he has to learn how to control the one by the other without being able to see the internal mechanism that links them. In our daily lives we are confronted at every turn with systems whose internal mechanisms are not fully open to inspection, and which must be treated by the methods appropriate to the Black Box.'³⁰

So it was that the 'self-regulating systems' reaching out for an apple in the manner of a guided missile described by Kepes (in the same year – 1956) and the 'self-organising systems' attending the 1959 conference were joined by the 'black boxes' of everyday mechanical reality. All were subject to the same laws of feedback, homeostatic self-regulation, and self-organisation originating in the confluence of information theory and biology, and being discussed by scientists at numerous cross-disciplinary colloquia and in print through the 1960s. These same systems, whose behaviour was in principle subject to probabilistic analysis under the auspices of a generalised stimulus-response, input-output logic, became a convenient replacement for an unpredictable, alienated, and contingent subjectivity for theorists who, like Alexander, were unsatisfied with the ability of

designers in the thrall of such a condition to cope with the complexities of modern life.³¹

The precise degree to which the somewhat discredited methods of a generalised cybernetics have contributed to today's scientific research is matter belonging to historians of science, although in Kauffman's case he did have direct contact with participants in the earlier discourse, including a brief residency in the house of cybernetician Warren McCulloch. But in terms of the irresistible segue into architecture, today's scientific efforts have much in common with their architectural precursors, since – as seen with the example of Alexander – earlier architectural efforts to take into account the complexity of the lifeworld were also about reconstructing a home in a universe turned on its head by science.

Inside-out

The swerve from Gropius's functionalism to Alexander's behaviourism is in turn a useful example of an oscillation common in postwar architectural discourse and latent in many of today's preoccupations: from a determinism based on inner workings (illustrated by the enthusiasm of Gropius and his friends for perceptual psychology) to a determinism indifferent to internal factors and based solely on diagrammable performance. Where Gropius rehearses the century-old parallel between the functioning of organs and the functioning of spaces and imagines a community of individuals with common 'biological needs', Alexander obsessively diagrams communities composed fundamentally (and tragically) of inscrutable, behaviouristic black boxes – nodes in a cybernetic

network. Both, however, pursue their models in the name of organic totality, a universal system operating at all scales. For Gropius (and this is also the link to the earlier integrative pedagogy at the Bauhaus), it is a totality to be managed by teamwork: industrial designers, architects, planners, economists, sociologists, etc., all exchanging information in the interest of the whole; whereas for Alexander the network is projected at the level of the diagram, breaking down the 'design problem' into a system of subroutines and algorithms. Still, neither acknowledges that such complete integration carries its own peril: the possibility that the network, or the team, will succumb to over-integration, a kind of super-organisation that can only ever result in system failure.

This is the significance of Kauffman's 'edge of chaos' scenario. From both a technical and a conceptual point of view, the paradox of his insistence on the existence of 'universal laws' connecting the diverse arenas in which he suggests his hypotheses may be applicable is that things can only be connected in one big – indeed literally 'universal' – self-organising system if they are not connected too much. Hardly homeostatic, Kauffman's self-organising systems are systems 'far from equilibrium', a phrase borrowed from Ilya Prigogine's work in thermodynamics. They are creatively unstable systems whose behaviour is nevertheless predictable within certain limits. This is the moral of self-organisation: the story of a threshold of connectivity at which things spring to life, below which they would plunge into a disorganised chaos like that being heroically resisted by Wiener's communicative organisms, and beyond which they

would stall in a kind of bureaucratic malaise of over-regulation (caricatured with an apparently straight face by Kauffman in one example as a 'Leftist Italian' and 'Stalinist' regime respectively). Thus can Kauffman declare, with almost unbelievable innocence: 'We may have stumbled into new grounds to see democracy, stumbling governmental mode of an increasing fraction of the globe, as utterly natural.'³²

The promise of such a formulation clearly carries with it its own conventionalities. First is the assumption that what is natural is good, the tautological correlate to the desire, barely concealed in Kauffman's remarks, to see the already-extant 'good' (i.e., 'democracy') as natural. Kauffman himself acknowledges the possibility of this pitfall. But more significant is the assumption that life-giving, communicative organisation itself is a *sine qua non* of cultural well-being. *This* assumption is more properly a correlate of the ultimate implication of cybernetics: the draining of consciousness out into a fully externalised system, an outside with no inside, composed of black box-like nodes whose internal workings matter only to the extent that they participate in communicative relations with their neighbours. Such an image, of cold, over-exposed exteriority, robs the subject of the last 'home' modernity has allowed it: the interior of consciousness itself. So to organise these boxes is to restore that home, by reassuringly integrating them into a dynamic network as 'alive' as they once were.

Black Clouds

In 1957, the distinguished British cosmologist Fred Hoyle published *The Black Cloud*, a science fiction

tale of a huge cloud that drifts from deep space into our solar system and becomes lodged between the earth and sun, wreaking havoc with the earth's diurnal cycle. A group of scientists assembled at an allegorical stand-in for a British wartime research facility, puzzled by the cloud's unexpected interference with earth-based radio transmission, eventually realise that signals are being transmitted within the cloud itself. From here, armed with an understanding of life as an informational process, it does not take them long to realise that this cloud is in fact alive, a product of the same evolutionary development that produced life on earth but virtually dematerialised, composed only of small solids suspended in a vast gaseous matrix rather than flesh and blood. Thus the book's scientist-protagonist speculates:

'Let me describe how I see biological evolution taking place within the Cloud. At an early stage I think there would be a whole lot of more or less separate disconnected individuals. Then communication would develop, not by a deliberate inorganic building of a means of radiative transmission, but through slow biological development. The individuals would develop a means of radiative transmission as a biological organ, rather as we have developed a mouth, tongue, lips, and vocal chords. Communication would improve to a degree that we can scarcely contemplate. A thought would no sooner be thought than it would be communicated. An emotion would no sooner be experienced than it would be shared. With this would come the submergence of the individual – an evolution into a coherent whole.'³³

The cloud consequently turns out to be a conscious, organised system shuttling from galaxy to galaxy, a dynamic information-processing unity made up of originally diverse – and opaque – individuals. But as the cloud itself implies in communication with the scientists, its organisation (and that of its species) was not spontaneously generated, although exactly how it arose is not made clear. So it is not surprising to find Kauffman citing Hoyle's scientific work on just this point. Lining up examples of objections to the possibility that life sprang up more or less out of the blue, Kauffman refers to a calculation performed by Hoyle and a colleague that concluded that the odds of spontaneously assembling the 2000 enzymes necessary to produce a single bacterium were about 1 in $10^{40,000}$ – unthinkable improbable. Kauffman argues, however, that Hoyle and others failed to appreciate the power of self-organisation:

'If this argument [Kauffman's] is correct, metabolic networks need not be built one component at a time; they can spring full-grown from a primordial soup. Order for free, I call it. If I am right, the motto of life is not We the improbable, but We the expected.'³⁴

Mapped onto *The Black Cloud*, the implications of these remarks would be as follows: just as self-organisation brings the black box to life, so it would explain the cloud's existence. In other words, self-organisation is able to domesticate 'enemy' black boxes and inscrutable clouds of alien information alike, by integrating them into communicative

life-forms, in this case intergalactic ones literally at home in the universe.

In the concluding chapters of Hoyle's story, having established communication with the cloud, the assembled scientists are eager to receive whatever knowledge its vastly superior intelligence has to offer. Unexpectedly however, the cloud discovers it must leave, so it is arranged that it downloads its secrets into the brain of a single individual. At the first try, the chosen individual inexplicably regresses into a state of profound delirium and dies. Heroically, the scientist-protagonist volunteers to be next. But after a mighty struggle, he too succumbs. The reason: the sheer amount of neural reprogramming was too much, overturning too rapidly established thought patterns and deeply held assumptions.

Like the story of self-organisation and the figure of the black box, the story of the black cloud is instructive not for its scientific presumptions – which we are in no position to evaluate here – but for its conceptual dynamic. Faced with the awesome implications of access to intelligence far beyond the scope of that available during the normal course of earthly events, the human nervous system crashes, in an extreme instance of information overload. As the complementary inverse of the process of downloading consciousness into a dispersed network of memory banks and feedback loops, this overload is nothing if not the dominant pathology haunting the period during which Hoyle's book was written. It is also what links the book with its architectural contemporaries, since bewildering clouds of information inaccessible to existing systems of reception in the

form of a perceptual apparatus organised by architecture were the background against which first Kepes and then Gropius lamented the alienating effects of scientific over-specialisation, for which Alexander subsequently proposed a corrective.

In *Scope of Total Architecture*, Gropius gave an evolutionary account of 'the sociological premisses for the minimum dwelling', utilising the same premisses underlying the fictional evolution of organised unity within the black cloud, arguing that

'[r]ecognition of the evolutionary development of man's biological and sociological life processes must lead to a definition of the task at hand; only after this has been accomplished will it be possible to solve the second part of the problem, the establishment of a practical program for realizing the minimum dwelling.'³⁵

The evolution that Gropius proposes (based on the early twentieth-century work of German sociologist Franz Müller-Lyer) proceeds from kinship and tribal law through family and family law to the individual and individual law, foreseeing an era of cooperation and communal law. Gropius locates his own moment as that of the individual, and argues for high-rise dwellings providing a maximum of individual rooms in addition to a maximum of light and air. But he adds that from an evolutionary point of view, merely to individualise is insufficient; communities must be planned that re-integrate the newly liberated free agents, since '[t]he body called "society" is an indivisible entity which cannot function when some of its parts are not integrated or

are being neglected; and when it does not function properly it will sicken.³⁶ By the 1950s, whether Gropius knew it or not (and certainly his friend Kepes did), the 'body' in question, including the social body, was understood scientifically as an informational one (what Wiener called a 'communicative organism'), and the most virulent threat to its health was information overload.

In the revised version of the earlier text on architecture in a scientific world included in the same volume, Gropius brings to bear on this problematic the notion of 'teamwork' – the subordination of individuality to the interest of the whole. Acting *like* a scientist with the help of scientists and armed with an evolved and biologically calibrated housing standard, Gropius's architect-as-team-player must initiate what he calls 'experiments in living' in order to advance human evolution to the higher plateau of collaborative unity. For Gropius, this is a thoroughly natural process:

'advanced teamwork [...] will naturally develop more and more in the future with the ever-widening horizon of our physical knowledge of which each of us commands only a small segment. The task is too big for individuals alone [...]. What a wealth of new information for the sociologist, the economist, the scientist and the artist would be forthcoming, if groups, formed of the most able planners and architects available, should be commissioned to design and build new model communities!³⁷

More than even the teams of scientists assembled in Hoyle's fictitious institute to confront the black

cloud, at Oppenheimer's very real Los Alamos to study atomic weaponry, or today in Santa Fe to study complexity, self-organisation, and artificial life, Gropius's architect-teams are not only there to synthesise the knowledge of specialists; they are there to provide empirical research with a coherent, functional model of reality – the 'total architecture' of the book's title, in the form of 'model communities'. If this 'total architecture' resembles even superficially the 'grand architecture' invoked by Kauffman, and materialised in the network image in which he feels most at home, it is because they both belong to the same family of universalising gestures undertaken to ward off confusion, indifference, and arbitrariness.

What seems almost magical about Kauffman's model, however, is that unlike the rigorous professionalisation on which Gropius's programme rests, it requires no sense of collective will and no planning to produce the vibrant whole, bringing it again closer to Alexander's attempts to simulate digitally his 'unselfconscious' natural communities by replacing the *planner* with the *system*. The fantasy is that as it is dispatched into what Kauffman calls 'the swirl of ideologies, fashions begetting fashions, cuisines begetting cuisines, legal codes and precedents begetting the further creation of law', the logic of self-organisation will make sense of it all. What is more, it will naturalise for us a notion of democracy that bears striking resemblance to the corporate state, where '[b]oth *E. Coli* and IBM coevolve in their respective worlds', waving the flag of diversity and multiplicity while providing further reassurances of the lawlike necessity of such contemporary traumas as downsizing: 'No single

person at IBM, now downsizing and becoming a flatter [less hierarchical] organisation, knows the world of IBM, yet collectively, IBM acts.³⁸ Magically.

If such an account seems ungenerous to what is fundamentally a brilliant scientific sensibility enthusiastically promoting a relatively benign form of crossdisciplinarity, it is because what is at stake here is not the legitimacy of the science but rather its potential encounters with architecture. Architecture cannot ignore science, but neither can science, to the extent that it devotes itself to constructing homes, ignore architecture. For good reason, architects have long been searching for ways of mitigating the indulgences of authorship and dethroning the overarching logic of the master plan. At a superficial level, the principles of self-organisation and complexity may even seem ideally suited to de-hierarchising both architectural object and process, while providing ways of systematising a controlled and ever-evolving multiplicity that resonates loosely with philosophies of difference. But despite promises of fluidity and emergent interdependence evident in rhetoric like Kauffman's, a rather more rigid logic quickly shows through. This is the logic of the *system* as such – self-organising or otherwise. The overdeterminations of the planner are not eliminated when the system takes over. They are merely dispersed, rendered almost unrecognisable in their diffuse and nearly transparent camouflage, but still there. There is still the desire to control, to systematise, to organise. There is still the intense anxiety in the face of exteriority, of something unaccountable and outside the system's open-ended matrix. This is why the system, especially the self-organising system, is always a

home – a social, economic, and technical network organising its inhabitants into comprehensible patterns and protecting them from the dark outside, where clouds of unintelligible information constantly threaten to envelop their willing communicants, an outside that seems increasingly to issue from *within* our ubiquitous input-output boxes.

Confronted with such a condition, the attraction of such apparently novel models is considerable. But if the bottom line on such phenomena as the silicon-based ecologies of artificial life is that they are truly alive – 'model communities', to borrow Gropius's term, and not mere simulacra of their carbon-based counterparts – it must also be remembered that certain semiotic theories of language that have haunted architecture for decades are also rooted in cybernetic concepts. Witness, for example, Umberto Eco's *The Open Work* of 1962, another instance of transfer between science and art, with an entire chapter dedicated to superimposing the work of Norbert Wiener and other information theorists onto a poetics of semiotic 'openness'. Likewise, just as we have found hints of an *image* (Kauffman's network-image daydream) lurking within otherwise mathematical hypotheses, science itself is not exempt from extra-scientific determinations and ambiguities. Witness here Donna Haraway's early work on the role of images of 'crystals, fabrics, and fields' in the organicist biology that first began to appreciate the significance of information theory, or more recently, Peter Galison's exhaustive study of the interchange between 'image'- and 'logic'-driven instruments and techniques utilised by the

multiple communities of twentieth century micro-physics.³⁹ So it is with the 'home', a captivating yet elusive figure promising refuge for a modern subjectivity squeezed more and more out into the open, free but also vulnerable, dispersed into communications networks awash in unprocessed information, and seemingly confronted with an ultimatum: integrate or die.

This perceived ultimatum also indicates a new valence carried by 'life' as both a technical and an aesthetic term. Understood as a self-organising process, 'life' brings us in from the cold, indifferent modern universe of contingency and discontinuity to a new home. In one stroke, the most awesome, barren desert of all – the universe itself – is converted into a domestic interior. And the network, the system of systems in which we are suspended, is no longer seen as a threat to our subjective integrity and bearer of information overload, but as the agent of our homecoming. Such is the force of the domesticating imperative, just as in architecture today's receptiveness to scientific reassurances is often accompanied by deadpan denouncements of the 'fragmentation' presided over by various practices of the 1980s, in favour of a new continuity figured resolutely and without irony in the mass-produced computer-generated 'fields', 'networks' and other 'systems' issuing from numerous architectural precincts. It is not accidental that such efforts also implicitly or actively oppose themselves to a *retardataire* architecture of inert, transparent or semi-transparent boxes. This misses the point entirely, but with a certain precision. Like its counterpart the cloud, the cybernetic box – which is the one box that truly haunts our *fin-de-siècle* moment

– is anything but transparent and possibly alive. But it *is* radically other and often perceived as an opaque and inscrutable alien, invading both workplace and home. Following in the footsteps of Alexander diagramming the settlement patterns of premodern villages, this new form of alterity is thus vigorously domesticated by making the flows and fluxes of its self-organising processes show themselves on its surfaces.

But should those interested in the future of architecture ever decide to abandon once and for all the endless rehabilitation of the home in its many guises, we might consider taking advantage of scientific overtures to restate the problem entirely: to reply that no, the home is not natural, nor is nature a home, while the supposedly dark, inchoate outside of noise, confusion, overload, and breakdown is something more than merely a threat to the well-organised systems inside which we remain. We might at least dare to venture out into the noise, if only in protective vehicles designed to navigate a future more uncertain than ever:

'It appeared in the sky ahead of us and to the left, prompting us to lower ourselves in our seats, bend our heads for a clearer view, exclaim to each other in half finished phrases. It was the black billowing cloud, the airborne toxic event, lighted by the clear beams of seven army helicopters. They were tracking its windborne movement, keeping it in view. In every car, heads shifted, drivers blew their horns to alert others, faces appeared in side windows, expressions set in tones of outlandish wonderment.'⁴⁰

Notes and References

1. Stuart A. Kauffman, *At Home in the Universe: The Search for the Laws of Self-Organization and Complexity* (New York, Oxford University Press, 1995), p. 20.
2. A partial survey of the popular and semi-popular literature on complexity theory, self-organisation and related hypotheses would include, in addition to Kauffman's work, such early texts as Ilya Prigogine and Isabella Stengers, *Order out of Chaos, Man's New Dialogue with Nature*, (New York, Bantam Books, 1984), Ilya Prigogine, *From Being to Becoming: Time and Complexity in the Physical Sciences*. (New York, W.H. Freeman & Co., 1980), James Lovelock, *Gaia, A New Look at Life on Earth*, (New York, Oxford University Press, 1979), as well as such non-specialist popularisations as M. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos* (New York, Simon & Schuster, 1992) and Kevin Kelly, *Out of Control, The New Biology of Machines, Social Systems, and the Economic World* (Reading, MA, Addison-Wesley Publishing Co., 1994), among others.
Kauffman, working out of the Santa Fe Institute in Santa Fe, New Mexico, is widely recognised as a key spokesman for a cross-disciplinary scientific discourse on complexity. See Waldrop, Chapter 3, 'Secrets of the Old One', 99–135, and Kelly, Chapter 20, 'The Butterfly Sleeps', 389–403. More than many of his colleagues, Kauffman has made perhaps the most far-reaching claims for the extra-scientific scope of complexity theory, effectively inviting workers in other fields to attempt theoretical translations and to test various concrete applications, while also figuring as an important player in current debates on the origin of life (see Jeff Horgan, 'Life, life everywhere,' *Scientific American Explorations*, <www.sciam.com/explorations>).
3. Kauffman, *At Home in the Universe*, p. 24.
4. *Ibid.* p. vii.
5. In the words of Christopher Langton, often credited as the founder of the discipline, 'artificial life' refers to 'life made by humans rather than by nature'. In practice, this most often means digital (computer-based) 'ecologies', or systems of code represented graphically on an interface and exhibiting lifelike (or living) behaviours, such as emergence, adaptation, selection, and self-reproduction. Langton's edited anthology *Artificial Life: An Overview*. (Cambridge, MIT Press, 1995), subsequent issues of the journal *Artificial Life* from which its material is drawn, and Claus Emmeche's survey *The Garden in the Machine* trans. S. Sampson. (Princeton, Princeton University Press, 1994), are key texts in the early history of this young discipline.
6. Kauffman, *At Home in the Universe*, p. 71, quoting from Jacques Monod, *Chance and Necessity* (1970), trans. A. Wainhouse (New York, Knopf, 1971).
7. Kauffman most clearly articulates the significance of information theory for contemporary biology in an earlier and more technical work, where he provides an account of the convergence of postwar information theory and

contemporary genetics, 'Discovery of the operon helped introduce cybernetic phraseology into biology, and the image of genes turning one another on and off is now coupled to the central notion of a genetic program underlying ontogeny. Since Boole formulated logic in his binary laws, it has become clear that with a small number of Boolean functions – in particular, 'no', 'or', and 'if' – it is possible to derive all of logic. A critical implication of the completeness of 'no', 'or', and 'if' was the discovery by Turing of universal computing systems. Such systems are able to carry out any algorithmically specifiable computation. This universal computing capacity is the logical basis of general-purpose computers, which can perform, in principle, any well-specified algorithm. Thus the fact that regulatory relations in metabolic pathways and in control interactions among the genes themselves can be arbitrary and gratuitous from the chemical point of view has been taken to imply that the cybernetic system within an organism – in other words, the genetic program of the organism – can in principle be rearranged to compute any algorithm, to behave in any way.' Stuart A. Kauffman, *The Origins of Order: Self-Organisation and Selection in Evolution* (New York, Oxford University Press, 1993), p. 10. Key reference texts are Monod, *Chance and Necessity* and François Jacob, *The Logic of Life: A History of Heredity* (1970), trans. B.E. Spillmann New York, Pantheon, 1973.

8. *Ibid.*, 12–13.

9. Kelly, *Out of Control*, p. 389.

10. Kauffman, *At Home in the Universe*, pp. 27–28.

11. Here I am referring to the ongoing hybridisation of machines and organisms within increasingly complex feedback-driven assemblages, many of which are based on technologies developed during the Second World War. The most recognisable manifestation of this is in the figure of the 'cyborg', or cybernetic organism, first given serious theoretical treatment by Donna Haraway in 'A Manifesto for cyborgs, science, technology, and socialist feminism in the 1980s', *Socialist Review*, 15 (2), (March–April 1985), pp. 65–107, which has in turn given rise to an entire discourse on machine-organism hybridities. See, for example, Chris Hables Gray (ed.), *The Cyborg Handbook*. (New York, Routledge, 1995).

12. On the political efforts of Oppenheimer and other scientists after Hiroshima, see Paul Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age* (Chapel Hill, University of North Carolina Press, 1984), Part 3, 'The atomic scientists: from bomb-makers to political sages', pp. 47–106. See also J. Robert Oppenheimer, *The Open Mind* (New York, Simon and Schuster, 1955).

13. Walter Gropius, *Architecture and Design in the Age of Science*. (New York, The Spiral Press, 1952), p. 2. The text was first published as 'The position of architecture in the century of science' in *The Architect and Building News* (19 July, 1951), pp. 71–74, and then as 'Architecture in a scientific world' in *The Builder* (28 December, 1951), pp. 901–904, before being published as a small pamphlet, above.

- Gropius presented the text as a lecture to the Royal Institute of British Architects on 2 July, 1951 on an invitation by the MARS Group. The text was then incorporated in revised form in Gropius, *Scope of Total Architecture* (New York, Harper & Row, 1955).
14. Two thorough accounts of the fascination of modern artists and architects with non-Euclidean geometry, relativity theory and associated scientific innovations are Stephen Kern, *The Culture of Time and Space 1880–1918* (Cambridge, MA, Harvard University Press, 1983), and Linda Dalrymple Henderson, *The Fourth Dimension and Non-Euclidean Geometry in Modern Art* (Princeton, Princeton University Press, 1983).
 15. Oppenheimer, *The Open Mind*, p. 88.
 16. See 'Man in equipoise', Siegfried Giedion's concluding chapter in *Mechanization Takes Command: A Contribution to Anonymous History* (New York, W.W. Norton & Co., 1948), pp. 714–723.
 17. Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society*, 2nd revised edition (New York, Doubleday & Co., 1954), pp. 95–96.
 18. Gyorgy Kepes, *The New Landscape in Art and Science* (Chicago, Paul Theobald, 1956), p. 328.
 19. Kepes, correspondence with Mark Carroll of Harvard University Press, 7 January 1963, 4 February 1963. Carroll reply, 5 February 1963. Kepes, correspondence with Rudolf Arnheim, 11 January 1963. Gyorgy Kepes Papers, Archives of American Art, Washington, DC.
 20. Christopher Alexander, *Notes on the Synthesis of Form* (Cambridge, MA, Harvard University Press, 1964), p. 38.
 21. The proceedings of the conference were subsequently published in Marshall C. Yovits and Scott Cameron (eds), *Self-Organizing Systems: Proceedings* (New York, Pergamon Press, 1960). Another conference was held two years later and published as Marshall C. Yovits, George T. Jacobi, and Gordon D. Goldstein (eds), *Conference on Self-Organizing Systems*. (Washington, Spartan Books, 1962). The first conference is also mentioned in Kelly, *Out of Control*, who quotes Dr. Weyl's greeting, (p. 450). More than a decade earlier, another set of interdisciplinary conferences were begun in the interest of exploring the implications of a then-nascent cybernetics. These were the ten Macy Conferences on Cybernetics, supported by the Josiah Macy Jr Foundation and held between 1946 and 1953. In addition to representing an opportunity for mathematicians, biologists, physiologists and other scientists to discuss and debate their findings, an important emphasis of these conferences was the potential applicability of cybernetic methods to psychology, to the social sciences, and to anthropology. Key participants included anthropologists Gregory Bateson and Margaret Mead, as well as mathematicians John von Neumann, Norbert Wiener, and Walter Pitts, among many others. The context and content of these conferences are presented and analysed in Steve J. Heims, *The Cybernetics Group* (Cambridge, MA, MIT Press, 1991). Heims also points out the significance of these

- discussions for the later work on self-organising systems.
22. Alexander, *Notes on the Synthesis of Form*, p. 21.
 23. *Ibid.* p. 3.
 24. Walter Gropius, 'Is there a science of design?' Reprinted in Gropius, *Scope of Total Architecture*. Kepes makes use of perceptual psychology dating back to the Gestalt theory of the 1920s in *Language of Vision* (Chicago, Paul Theobald, 1944). His friend Arnheim also had frequent recourse to Gestalt psychology and related ideas. See, for example, Rudolf Arnheim, *Art and Visual Perception: A Psychology of the Creative Eye* (Berkeley, University of California Press, 1954).
 25. The most explicit example of visual perception treated in terms of 'biological needs', and specifically, in terms of adaptation of the optical faculty to the pace of modern life, is to be found in László Moholy-Nagy *The New Vision: From Material to Architecture* (1929), trans. D. M. Hoffman (New York, Brewer, Warren & Putnam, Inc., 1932), revised as *The New Vision: Fundamentals of Design, Painting, Sculpture, Architecture* (New York, W. W. Norton & Co., 1938), and again in Moholy-Nagy, *Vision in Motion* (Chicago, Paul Theobald, 1947).
 26. Giedion, 'Notes on the Ames demonstrations: art and perception', *Transformation: Arts, Communication, Environment* 1 (1) (1950), p. 8.
 27. Alexander, *Notes on the Synthesis of Form*, pp. 4–5. Alexander appends these remarks with a footnote referring to similar remarks from both Moholy-Nagy (in *The New Vision*) and Gropius (in *The New Architecture and the Bauhaus*).
 28. Peter Galison, 'The ontology of the enemy, Norbert Wiener and the cybernetic vision', *Critical Inquiry*, 21 (1), (Autumn 1994), pp. 228–266.
 29. Arturo Rosenblueth, Norbert Wiener and Julian Bigelow, 'Behavior, purpose and teleology', *Philosophy of Science*, 10 (January 1943), p. 18.
 30. W. Ross Ashby, *An Introduction to Cybernetics* (New York, John Wiley & Sons, 1956), p. 86.
 31. If the travesty of Alexander's positivism did not carry the translation of these ideas into architecture to its logical conclusion, the continuity between the early and current proselytising of MIT architecture graduate and *Wired* guru Nicholas Negroponte has. Making frequent reference to Alexander's work though almost entirely alienated from the architectural mainstream, Negroponte published two books in the early 1970s, *The Architecture Machine* (Cambridge, MA, MIT Press, 1970), and *Soft Architecture Machines* (Cambridge, MA, MIT Press, 1975), documenting the efforts of his research group at MIT to deploy the potent combination of behaviourism and informatics in its fullest instrumentality in all facets of architectural design and production. Faithfully quoting from earlier cybernetic sources into which ever more lethal doses of empirical opportunism are injected, Negroponte reproduces Alexander's nostalgic spatial algorithms in futuristic form. See also Negroponte, *Being Digital* (New York, Alfred A. Knopf, 1995),

esp. Chapter 10, 'Looking and feeling' and Chapter 12, 'Less is more'. Though with respect to architecture his direct influence is negligible, Negroponte's threefold projected role for the computer – as designer, as collaborator, and as environmental regulator – does prefigure a number of today's peculiarities, from the efforts of designers to defer to the juvenile logics of various software packages, to puerile (if more sinister) fantasies of environments that mutate according to the adolescent whims of their inhabitants, realised in aborted form in the sprawling house designed by Peter Bohlin for Microsoft demagogue William Gates.

32. Kauffman, *At Home in the Universe*, p. 271.
 33. Fred Hoyle, *The Black Cloud* (New York, Harper & Row, 1957), pp.179–180.
 34. Kauffman, *At Home in the Universe*, pp. 44–45.

35. Gropius, *Scope of Total Architecture*, p. 91.
 36. *Ibid.* p. 116.
 37. *Ibid.* p. 148.
 38. Kauffman, *At Home in the Universe*, pp. 298, 300, 246.
 39. See Donna J. Haraway, *Crystals, Fabrics, and Fields, Metaphors of Organicism in Twentieth-Century Biology* (New Haven, Yale University Press, 1976) and Peter Galison, *Image and Logic: A Material Culture of Microphysics* (Chicago, The University of Chicago Press, 1997) respectively.
 40. Don DeLillo, *White Noise* (New York, Penguin Books, 1985), p. 127.

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I would like to thank Henry Urbach for his insightful editorial comments on earlier versions of this text.

The meaning of molluscs: Léonce Reynaud and the Cuvier- Geoffroy Debate of 1830, Paris

Paula Young Lee

In Paris, in 1830, a fierce debate broke out in the Académie Royale des Sciences between zoologists Georges Cuvier and Etienne Geoffroy Saint-Hilaire over the anatomy of molluscs. At the same time, a heated controversy arose in the Académie des Beaux-Arts between Quatremère de Quincy and Henri Labrouste over the morphology of built form. Among Labrouste's supporters was architect Léonce Reynaud who, along with his brother Jean Reynaud, a prominent editor and philosopher, also supported Geoffroy's side in the debate. These men saw the slow growth of the mollusc as a metaphor for human history, and they viewed its malleable body as a model for social reform. The architectural challenge was to accept the lower classes as the very future of urban society. In Paris, even as the July Revolution of 1830 raised the political stakes once again, this was the meaning of molluscs.

'Nature is . . . the true school of the architect, for every organised body is a building.' Johann Georg Sulzer, *Allgemeine Theorie der Schönen Künste*, 1771–74¹

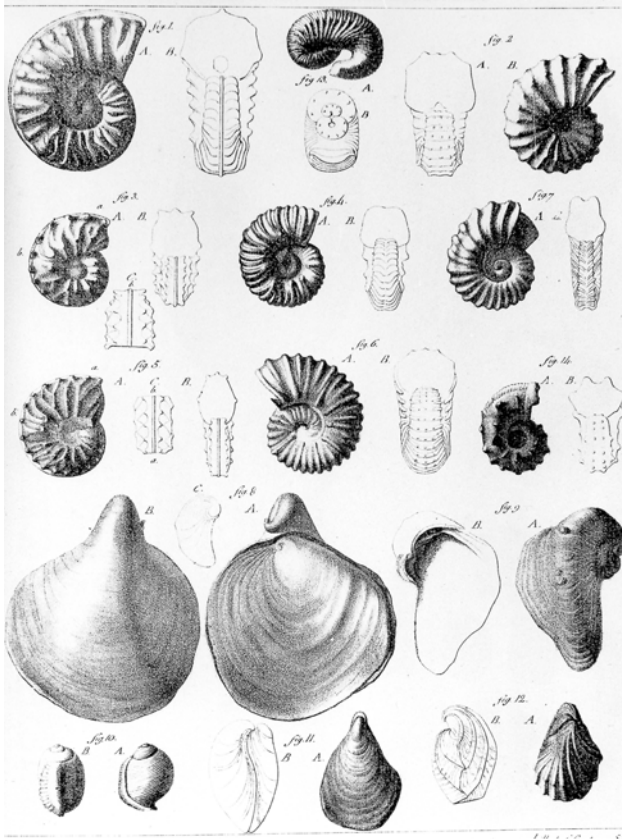
Introduction

'In a profound sense', observed architect and theorist Léonce Reynaud (1803–80) in 1834, one can 'compare human monuments to the shells formed by animals that imprint them with their bodies and thus make them their dwelling [logis].' The methods of natural science, he continued, 'make no distinction between the description of the shell and the description of the mollusc.'² Why did Reynaud link monuments to molluscs? What was 'profound' about their connection? There was nothing new in the analogy itself. In 1563, for example, Bernard Palissy observed that the shells of 'molluscs like oysters and snails' offered 'miraculous protection' to their interior mass, and should be

studied as prototypes for fortified cities.³ Architect Christopher Wren (1632–1723) discovered a perfect logarithmic spiral in the shell of snails, and extended the principle to the volutes of Ionic capitals. In the poem 'The Chambered Nautilus', Oliver Wendell Holmes (1809–94) suggested that the growth patterns of its shell might provide an excellent model for domestic architecture. These men admired the symmetry of a mollusc's outer husk, but they mentioned nothing about its soft body. For Reynaud, by contrast, the relationship between inhabitant and habitation was precisely the point.

In certain cases, there were indeed 'tight links that join the mollusc to its shell', wrote anatomist Georges Cuvier (1769–1832) in 1817. As a result, tell-tale traces of the transformation of 'a coat entirely of flesh' into a 'heavy, solid, spiral shell' might be observed by trained eyes (Fig. 1). Equally, however, 'there exist among molluscs very pronounced, very natural, and entirely independent separations of the

Figure 1. Lithograph, in Georges Cuvier and Alexandre Brongniart, *Description géologique des environs de Paris*, rev. ed. (Paris and Amsterdam, G. Dufour & E. d'Ocagne, 1822) (photograph: Special Collections, University of Chicago).



shell from its form.⁴ In nature, sheer variety precluded simple formulae. Similarly, Reynaud's comparison between monuments and molluscs should not be reduced to a one-to-one correlation between a living animal and its protective mantle. Although a shell's accretive pattern of growth held possibilities for the development of buildings and even cities as a whole, that aspect of the animal only half explains his choice. In order to grasp the full intentions of Reynaud's argument, it is important to recognise that molluscs had been the centre of a furious debate between Cuvier and his lifelong rival, Etienne Geoffroy Saint-Hilaire (1772–1844).⁵ From 1830 to 1832, they argued before the Académie Royale des Sciences in Paris over the anatomy of cephalopods, phylum Mollusca. In this highly public forum, Cuvier and Geoffroy also repeatedly compared man-made monuments to molluscs.

Molluscs meant something very specific to Cuvier, Geoffroy and Reynaud, as they did to other interested observers of the debate. Taxonomic issues were certainly at stake, but it was the political ramifications that gave these arguments an emotional charge. One German critic mocked the Parisian public by ordering: 'Give politics a rest; you are overwhelmed by zoology!'⁶ Even the July Revolution of 1830 paled in comparison with the scope and import of this intellectual battle. Whether the audience was French or foreign, the meaning of molluscs went far beyond the interests of pure science. They spoke to the hopes and fears of modern society, for molluscs, in sum, were understood as a metaphor for human history. On what basis should this history be 'organised'? Was the true substance of history found in the

workaday world of the lower classes, or was it embodied in a few, upstanding men? These were the troublesome, critical questions, to which no one – not even the greatest intellects of the period – had a clear answer. The people of Paris had already discovered that abstract ideas might transform into revolutionary actions, and pretty words could translate into powerful deeds. To their minds, the implications of molluscs for modern architecture were indeed profound. In this unstable socio-political climate, who could say what either of them might become?

The terms of the debate

At the close of the eighteenth century, Cuvier and Geoffroy began their careers at the Muséum d'Histoire Naturelle in Paris. They were collaborators, friends, and neighbours, for the Muséum was not only their place of work but their home. Together, they searched for methods of classification that would establish new order in the animal kingdom.⁷ Their shared as well as individual successes in this endeavour would ultimately reconfigure 'natural history' as the 'natural sciences', including the modern disciplines of comparative anatomy and palaeontology, the study of extinct life. After three productive decades of work, both men were still professors of anatomy at the Muséum, but their early partnership had hardened into bitter rivalry. They no longer shared the same scientific opinions. Instead, each anatomist espoused a view of nature that, like the former friends themselves, could not be reconciled with the other.

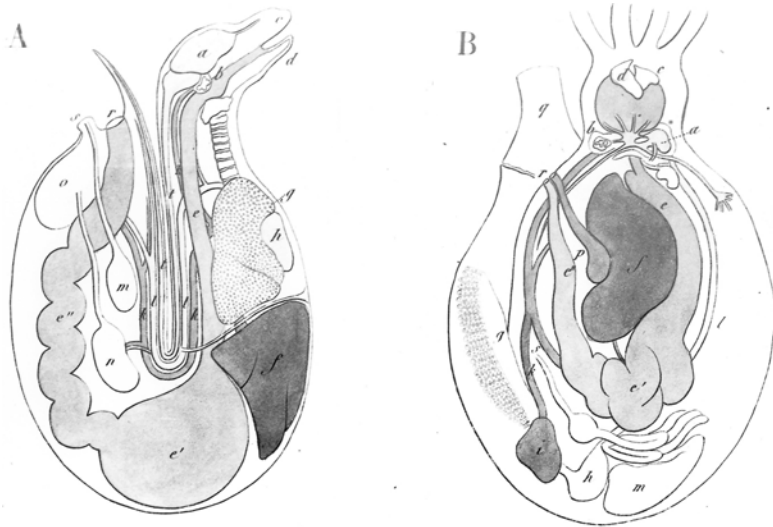
Cuvier held that there were 'four principal forms and four general plans [Vertebrates, Molluscs,

Articulates, and Radiates] . . . after which all animals appear to have been modelled.⁸ Each one of these four separate 'branches' (*embranchements*) were distinct and irreducible. They should not be confused with any 'slight modifications based upon the development and addition of some parts'. Regardless of appearances, the 'essence of the plan' remained constant.⁹ Because function determined structure, both form and function were fixed. By contrast, Geoffroy argued that the shape of organs transformed in response to external stresses. Their forms changed all the time, and the cumulative pressure

of millennia had produced thousands of variations in the animal kingdom. Yet, Geoffroy maintained, on a deeper philosophical and anatomical level, *all* organisms shared the same 'unity of composition'.¹⁰

The doctrinal differences between Cuvier and Geoffroy were no secret to the scientific community. Each had his supporters and disciples. Still, it was another thing for them to confront each other directly, and in full view of the public. The catalyst was a study written in 1829 by two obscure naturalists named Laurencet and Meyran, who argued that the viscera of a fish bent fully backwards

Figure 2. Georges Cuvier, *Figure A. La coupe d'un quadrupède ployé sur lui-même, de manière que le bassin revienne sur la nuque* [Section of a quadruped folded back on itself, in such a way that the pelvis comes back to the nape of the neck]; and *Figure B. La coupe d'un poulpe dans son état naturel* [Section of an octopus in its natural state], hand-coloured engravings, in *Annales des Sciences naturelles*, vol. 19 (1830), plate 12 (photograph: John Crerar Science Library, University of Chicago).



on itself resembled those of a mollusc (Fig. 2). Geoffroy claimed the paper proved that the internal parts of vertebrates and molluscs followed the same 'principle of connection'.¹¹ In fact, he noted, if you bent the fish *forward* the principle of connection still worked: once again its internal organs resembled that of a mollusc, but a gastropod rather than a cephalopod (Fig. 3).¹² Flip-flop! Thanks to the dexterous manipulations of Laurencet and Meyranx, a new possibility presented itself to view: despite Cuvier's insistence upon separating one category of animals from another, fishes and molluscs now seemed to share the same composition and plan.

Baron Georges-Louis-Chrétien-Frédéric-Dagobert Cuvier, peer of France, chair of Comparative Anatomy at the Muséum d'Histoire Naturelle (1802–32), chair of Natural History at the Collège de France (1800–32), and permanent secretary of the Académie Royale des Sciences (1803–32), was not pleased.

One week after Geoffroy presented his report, Cuvier read his rebuttal before the Académie Royale des Sciences. 'One of our learned colleagues,' Cuvier began, 'having avidly seized this new view, has announced that it *completely refutes* all I have said concerning the distance which separates molluscs from vertebrates.¹³ [emphasis in original]. In a word, this was nonsense. If the science of comparative anatomy was to be more than 'an edifice built upon the sand', stressed Cuvier, then its use of 'composition' and 'plan' should respect the architecture of the animal body. For example, he continued, 'the *composition of a house* is the number of apartments or chambers found there;

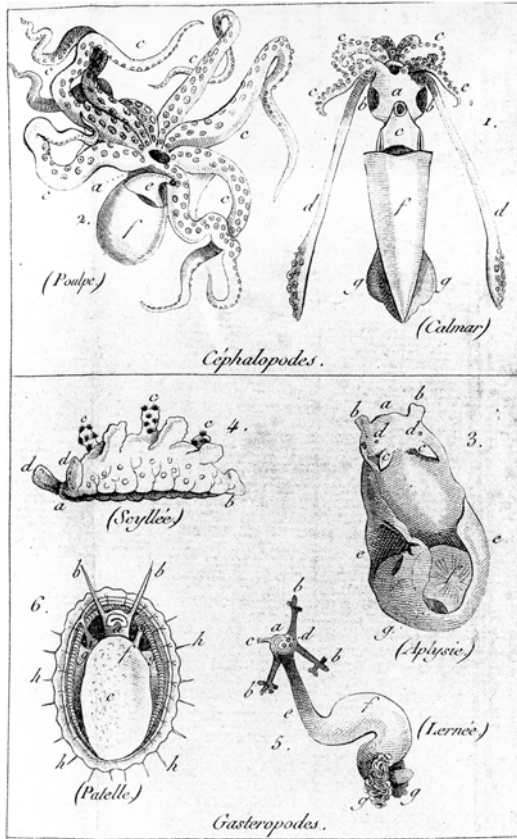
its *plan* is the reciprocal distribution of these apartments and chambers [emphasis in original].' Only these senses of the terms were acceptable when describing an animal's anatomy. He elaborated:

'If two houses each contained a vestibule, an antechamber, a bedroom, a salon and a dining room, it would be said that their *composition* is the same; if this bedroom, this salon, etc., were on the same floor arranged in the same order, and if one passed from one to another in the same manner, it would also be said that their *plan* is the same. But if their orders were different, or [these rooms] were on a single level in one of these houses but ranged on successive floors in the other, it would be said that these houses of similar composition were constructed following different plans.' [emphasis in original]

Likewise, the anatomist's use of 'composition' should strictly refer to individual parts, whereas the word 'plan' indicated the relative distribution of its organs. Because Geoffroy refused to recognise such demarcations, stated Cuvier, his intuitive approach toyed with the 'philosophical resemblances of beings', and lacked an empirical base.¹⁴

Cuvier's comments emerged from the specific intellectual and physical context that was the Muséum d'Histoire Naturelle, a vast institution that was simultaneously a school, research facility, botanical garden, zoo, natural history collection, and public museum (Fig. 4; the Muséum grounds are bounded by the rue de Seine, rue du Jardin du Roi, rue de Buffon, and the Seine River). Located next to the Latin Quarter on the Left Bank of Paris,

Figure 3. Georges Cuvier, *Céphalopodes/Gasteropodes*, engraving, in Cuvier, *Tableau élémentaire de l'Histoire naturelle des animaux* (Paris, Baudouin, an 6 [1797–8]). (Photograph: Special Collections, University of Chicago).



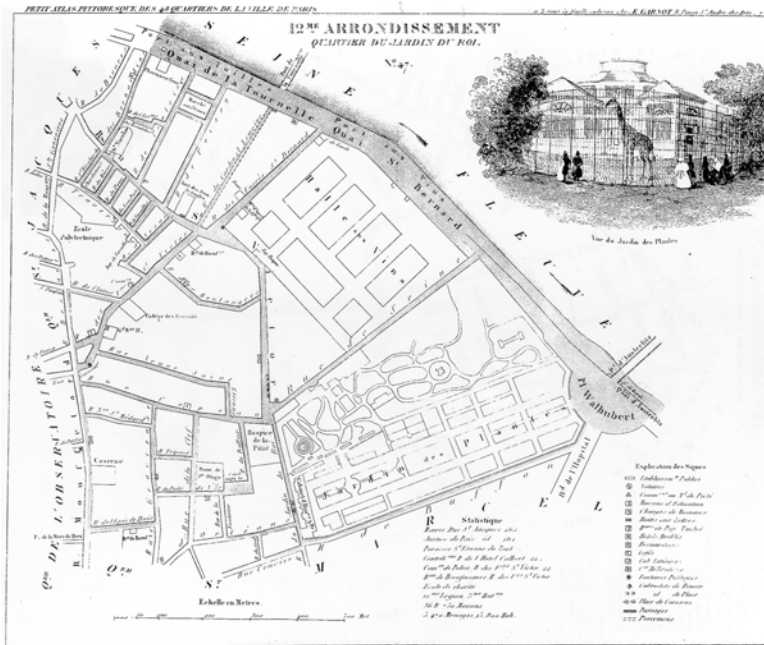


Figure 4. Aristide-Michel Perrot, 12^{me} arrondissement [now 5^{me} arrond.] Quartier du Jardin du Roi, plate 47 from Perrot, *Petit atlas pittoresque des quarante-huit quartiers de la ville de Paris* (Paris, n. p., 1834). (photograph: Bibliothèque Nationale de France).

the Muséum had been created in 1794 out of the Jardin des Plantes and the Cabinet d'Histoire Naturelle, both of which had become famous during the eighteenth century under the leadership of Georges-Louis Leclerc, comte de Buffon. In Cuvier's opinion, Buffon's efforts had been those of a 'visualist', especially in contrast to the equally

renowned work of Swedish botanist Carolus Linnaeus, a 'verbalist'. If their two approaches were combined, he suggested, the pictorial breadth of the former and the terminological specificity of the latter would generate 'the scaffolding of an edifice of much greater importance'.¹⁵ Thus grounded in history and shaped by modern science, the project

was sure to succeed. It went without saying that this important structure was to be raised by himself.

Cuvier had wasted no time giving full reign to his 'edifying' ambitions. He had begun teaching the public his comparative methods almost immediately upon his arrival in the city. His *Tableau élémentaire de l'Histoire naturelle des animaux* of 1798 accompanied lessons given at the Ecoles centrales du Panthéon de Paris, and was illustrated with plates that he had made himself. With these didactic drawings, he set the boundary lines and packed animal groups into boxes of space created by him for that purpose. He was known as a remarkable orator whose later lectures at the Collège de France regularly exceeded the 800-person capacity of the main amphitheatre. Using only a 'few fragments', marvelled the *Journal des débats* at the opening of one such lecture series in 1830, he could trace the history of 'a destroyed world'. No wonder he still 'commanded the attention of the European scientific community', and had sat on the 'throne of the natural sciences' for more than a quarter of a century.¹⁶ As a result of his political position and intellectual authority, a whole generation of Frenchmen had grown up with Cuvier's comparative methods, and learned to see the animal kingdom through his eyes.

As his scientific reputation grew, his residence at the Muséum expanded along with the exhibition galleries and research facilities of the Muséum. This period from the late 1790s to the mid-1830s was the 'golden age' of the institution, when it had both enough political importance and popular approval to readily obtain financial support for its work.¹⁷ This meant that when Jacques Molinos

(1743–1831), appointed the Muséum's official architect in 1794, sent off a set of drawings with a proposed budget to the centralised Conseil Général des Bâtiments civils, it usually gave the necessary approval to begin work. (Such was not the case with Molinos's less fortunate successor, Charles Rohault de Fleury.) In the light of Cuvier's responsiveness to architectural issues, it is interesting to speculate that his understanding of 'composition' and 'plan' may have partly derived from the lively building activity at the Muséum, and specifically from construction work on his own house.

Notably, Cuvier's house and the Gallery of Comparative Anatomy were directly attached to each other, reflecting the continuity between the private man and his professional work (Figs 5–7). No one misunderstood the symbolism: the Gallery of Comparative Anatomy was an extension of Cuvier's residence, not the other way around. Their functional and physical connections can be seen in an undated ground-floor plan of the Gallery of Comparative Anatomy sketched by Cuvier, where, among other things, a large chunk of the right end served exclusively as a storage space 'for the professor's house' (Fig. 8). On the opposite side of the gallery, a *grande pièce* for the dissection of very large animals dominated the end of the wing. This amply lit, well-heated room was followed by a smaller space for specimens of ordinary size, and then an area for the preliminary removal of flesh from the bones. The process concluded with a windowless room for final maceration, or the complete separation of soft parts from hard matter. In this left-to-right sequence, a huge beast was



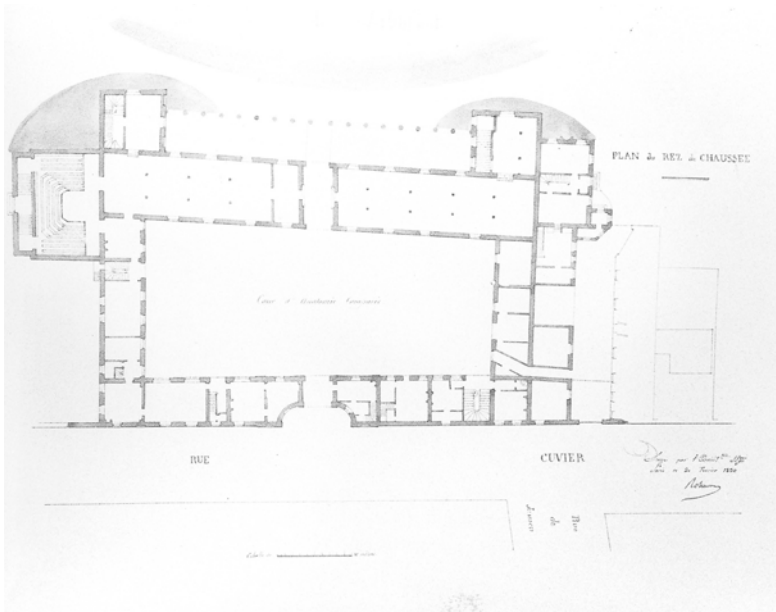
Figure 5. Cuvier's house and the former Gallery of Comparative Anatomy (now a preparation space), Muséum National d'Histoire Naturelle, Paris (photograph: author, 1997).

dissolved into tiny bits, and the workspaces themselves moved down correspondingly in size.

A door on the right end of the Gallery of Comparative Anatomy opened up to Cuvier's domicile, where the division of space followed the same sequential pattern. However, these rooms moved *up* rather than *across*. No one would have known better than he that the stacked rise of his living quarters was 'similar in composition' to the low spread of the Gallery, even as they were both 'following different plans'. In both places, the isolation of func-

tions and the imposition of clear order were paramount concerns. As British geologist Charles Lyell (1797–1875) described on a trip to see Cuvier: 'There is first the museum of natural history opposite his house, and admirably arranged by himself, then the anatomy museum connected with his dwelling.' Once inside the 'sanctum sanctorum' that was Cuvier's home, Lyell confirmed it was 'truly characteristic of the man'. Its most noteworthy feature was 'a library disposed of a suite of rooms, each containing works on one subject'. He elaborated:

Figure 6. Charles Rohault de Fleury, *Galerie d'Anatomie Comparée*, 1850, general plan of the ground floor (rez-de-chaussée), proposed reconstruction (Versement d'architecture, Archives Nationales, Paris).



'There is one where there are all the works on ornithology, in another room all on ichthyology, in another osteology, in another *law* books, etc. etc. When he is engaged in such works as require continual reference to a variety of authors . . . he often makes the rounds of many apartments.'¹⁸ [emphasis in original]

Cuvier was nothing if not consistent; his need to establish firm boundaries and isolate one category of thing from another was as true of the natural order as it was of his house. Concerning a new classification of molluscs he proposed in 1817, he stressed repeatedly: 'It is necessary that each of them occupies its place.'¹⁹ Such a directive takes on a whole new dimension in the light of his

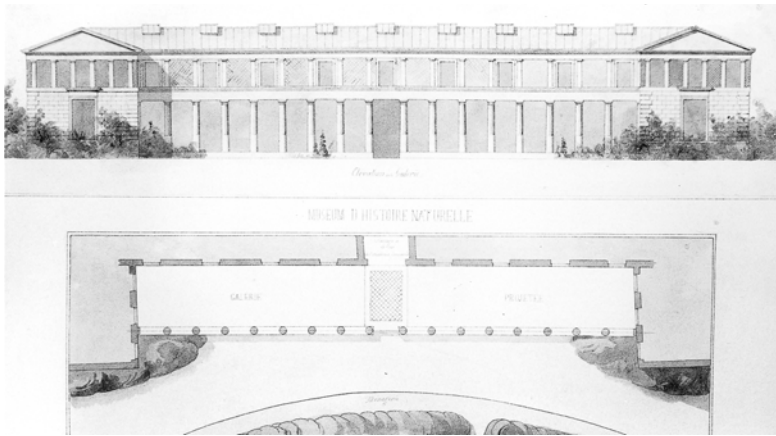


Figure 7. Charles Rohaut de Fleury, *Galerie d'Anatomie Comparée*, 1850, elevation and plan of front gallery (facing the Menagerie or 'jardin de l'anatomie' in Fig. 8), pencil, ink and wash, proposed reconstruction (Versement d'architecture, Archives Nationales, Paris).

obsessive separation of a different collection of 'hardbacks' into rooms of their own. Because of the high degree of correlation between a methodical system and a material structure that emerged over the same stretch of time, neither the unusual specificity of functions nor the 'organic' qualities of his house were lost on visitors to the Muséum.

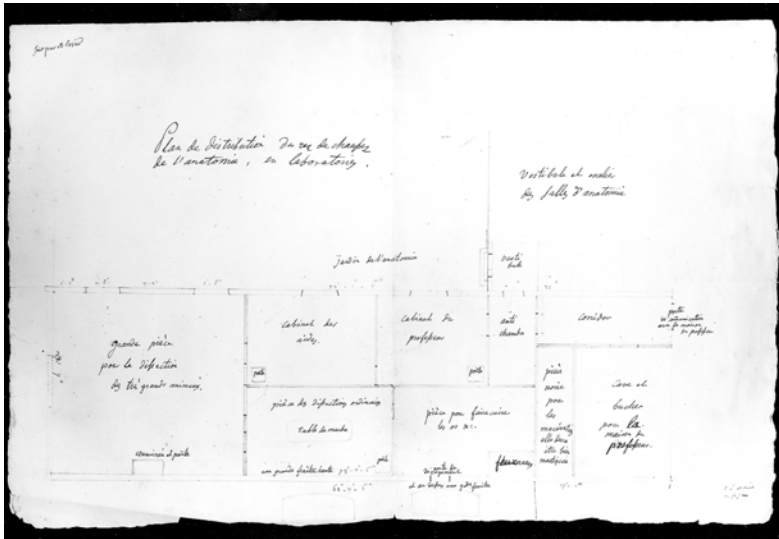
'As the works and researches of Cuvier multiplied,' stated an obituary notice following his sudden death in 1832, 'he enlarged his residence by a room, then another.' At the end of three decades of such work, his house had expanded from one to three stories. Thus its growth, being the result of a gradual accretion over a long period of time rather than completed all at once, signalled a reconciliation between reasoning mind

and material body through the agency of everyday practice. Or, as described in the review,

'his residence became an organic whole, a kind of scientific body in which he was the soul and where each organ laboured, functioned, and produced new agents in its own time and in turn, without bothering or stopping the movements of the other organs.'²⁰

Steadily adding room after room inside the masonry shell of his home in order to accommodate his intellectual growth, Cuvier augmented his living quarters in a way that recalled the relentless labours of the chambered nautilus praised by Holmes.

Figure 8. Georges Cuvier, *Plan de distribution du rez-de-chaussez de l'anatomie, en laboratoires, en laboratoires*, pencil and ink sketch, n.d. Autograph Letter File, 'Georges Cuvier' (box 1) (Wellcome Institute for the History of Medicine, London. Photograph: Wellcome Institute Library, London).



Stylistically speaking, the final result was undeniably plain. This was no great architectural work. Yet, for a striking number of visitors, 'la maison de Cuvier' was a fascinating sight. However vaguely, his contemporaries recognised his house as a conceptual structure realised as architectural form.

Not all agreed with his building programme, or thought much of his abilities as an 'architect'. Even when Cuvier was standing directly in front of the 'temple of Nature', one critic complained, he 'did not understand all the splendour of the edifice. He

saw only lines to reproduce, capitals to sketch, an architectural arrangement to describe, without seeing from all of it that there was a general idea to deduce.'²¹ In Geoffroy's blunt opinion, Cuvier was a mere 'stonecutter', who hacked perfectly good material into useless pieces.²² Destruction was easy; the difficulty lay in synthesis. What modern science required was an individual with different skills, someone who was capable of working as 'an architect and not as a sculptor'.²³ In certain people's opinions, that gifted 'architect' was Geoffroy.

By this time, Geoffroy was chair of Mammals and Birds at the Muséum d'Histoire Naturelle (1794–1841), chair of Zoology at the Faculté des Sciences (1808–1844), and member of the Académie Royale des Sciences since 1807. He responded to his rival's accusations by stating that he, not Cuvier, had been the first to correlate animal bodies with architectural works. A year earlier, in fact, Geoffroy had explained 'unity of composition' by way of comparison to urban dwellings. It was almost inevitable, he mused, that a large city such as Paris would have inspired him 'to reflect on the principles of architectural art and the uniformity of buildings'.²⁴ Having seen so many buildings in rapid succession, he was sure that they were 'not made *in view of another*' [emphasis in original] as rote copies that had been forced to follow a uniform stylistic code. Nor could 'a humble hut that had been augmented into a house, then a large hall', and so on, finally end up as 'a royal building'. Though all were sheltering structures made of similar materials, the types were too unlike each other to imply a direct morphological connection. Yet despite their physical differences, they might still lead '*conceptually* [back] to unity of composition . . . for the purpose of all is to serve equally as human habitation' [emphasis in original]. Sharing basic building materials as well as 'unity of function', all animal bodies emerged in a philosophical sense from the same archetype. As he later summed up: 'There is, philosophically speaking, only a single animal.'²⁵

Who was right? How to choose between 'two equal geniuses', as Honoré de Balzac (1799–1850) described them? Not purely on the basis of logic

but also according to nationalist agendas and political views: whereas Cuvier defended a 'narrow and analytical science' that was the pride of France's Cartesian soul, Geoffroy represented a 'pantheist' position for which he was 'revered' in Germany.²⁶ Many observers, Balzac included, associated Geoffroy's 'new principles' with a 'speculative school of nature' known as *Naturphilosophie*.²⁷ It was not without justification. 'In all living creation,' historian-philosopher Johann Gottfried Herder (1744–1803) had noted, one sees 'a certain conformity of organisation, . . . and even their principal parts are configured after a single prototype diversified into infinity. The internal structure of animals only makes this hypothesis more evident.' Whether looking at the anatomy of frogs, fish or fossils, Herder concluded, one might well see in them 'a single and same type of organisation'.²⁸ Small wonder, then, that Germany was interested in the outcome of the debate, watching and wondering who would win. No less a source than poet-naturalist Johann Wolfgang von Goethe (1749–1832) kept his compatriots informed of the 'contest'.²⁹ He was convinced that it had the highest importance, not only for modern science but for society as a whole.

Goethe agreed that the words 'composition' and 'plan' needed clarification.³⁰ In order to do so, it was necessary to begin by returning to 'materials'. He gave this familiar word a somewhat unexpected, if thereby revealing definition: it referred to animal organs that were 'unused' and 'awaiting an act of human will', in the same way that 'beams, boards and slats are materials ready to be made part of a construction.' According to this reading,

every organised body was indeed a building, just as Sulzer had commented a half century earlier,³¹ its startling implication was that animal bodies were literally disorganised and would remain so until the constructive intervention of a human hand. This was the next step.

Cuvier had borrowed the notion of the four *embranchements* from the craft of carpentry, Goethe noted, in order to evoke how 'one joins, one fits together, one branches [*embranche*] beams and rafters.' Hence the French zoological term *composition* should also look to the mechanical arts, thereby invoking simple structure and strong form at the same time.

Lastly, he concluded, the word *plan* 'came naturally to the spirit' in terms of a house or a city. For that same reason, he noted, its connotations were too deterministic, suggesting that a zoologist creates categories in the same way that an architect designs a building. In order to remedy this state of confusion, Goethe proposed to substitute the word 'type'.³²

Despite his good intentions, 'type' was another loaded term.³³ At the same time as the debate over molluscs in the Académie Royale des Sciences between Cuvier and Geoffroy, a similar confrontation was taking place in the Académie des Beaux-Arts between critic Antoine-Chrystostôme Quatremère de Quincy (1755–1849) and architect Henri Labrousse (1801–75). The subject under debate was a temple; at stake was the meaning of type.

In the bastions of French academic culture, parallel controversies were taking place over molluscs on one side, and monuments on the other. This point will be returned to shortly, for it

has everything to do with Reynaud's interest in both. Here, it underscores why Cuvier and Geoffroy could both look to architecture in order to explain their respective positions, yet could still be talking about two different things. On a fundamental level, the idea of architecture was also being pulled in different directions, over the meaning of composition, plan, and type.

The origins of architectural species

In 1832, the seventh edition of the *Encyclopaedia Britannica* suddenly redefined 'the elements of beauty in architecture' according to its underlying 'principles of composition' rather than the application of the Orders. Its reason was that there were many 'widely differing species of architecture', and it was evident that 'rules which apply to the one are totally inapplicable to the other.'³⁴ Here, too, the terms were telling. The very choice of words deftly reassigned critical categories in a way that, coincidentally enough, complied with Cuvier's system of grouping according to a strict 'law of composition'. Geoffroy's views were also transported abroad, producing similarly unpredictable effects. As Johannes Wetter (1806–97) commented in 1835:

'That they might be able to serve the purpose of the new system, the organs were modified as to their function and consequently also in their form ... New functions became necessary, therefore new organs were introduced into the organism.'

One might suppose that this description subscribed to the morphological position held by Geoffroy.

Perhaps, but the interesting point is that Wetter was describing the interior of the Cathedral of Mainz.³⁵

In 1830s France, architects were also choosing sides. For the moment, however, they had their own drama to attend. This too had begun late in 1829, catalysed by the work of a young academic on an entirely conventional subject: in this case, an ancient Greek temple. As winner of the prestigious Prix de Rome, an annual design competition open to students of architecture at the Académie des Beaux-Arts in Paris, Labrouste had been sent to Italy in order to study the great monuments of antiquity. All *pensionnaires* had a yearly obligation to send back a packet of drawings for review and evaluation by the Academy. For his fourth-year submission, Labrouste picked a group of temples at Paestum, a Greek colony in Italy. Crucially, his job wasn't just to record the ruins, but to reconstruct their former state. This was standard procedure. But when the Académie des Beaux-Arts looked at Labrouste's reconstructions of the temples at Paestum, it was confronted with an unexpected and unwelcome sight. The Académie des Beaux-Arts was very displeased with the drawings, and the person who was most upset by their content was its powerful permanent secretary, Quatremère de Quincy.³⁶

What had Labrouste done (or failed to do)? In these reconstruction views, he knowingly refused to render the neo-classicising response that the Académie des Beaux-Arts in general, and Quatremère in particular, held up as an irreproachable aesthetic standard. Instead, Labrouste interpreted built form as a mutable thing, one

that was wholly responsive to the local conditions, available materials, and practical concerns of its builders. Being contingent on circumstance and constantly changeable as a result, all forms of architecture, even those that served a lofty and enduring civic function such as a temple, were susceptible to transformation on the most mundane level.

To Quatremère, for whom the classical Greek temple was a perfect and hence permanent form, the views expressed by Labrouste were not only wrong, but offensive. As he had earlier complained in his entry, "Type", for the *Encyclopédie méthodique*, the introduction of small differences had already produced an unruly surfeit of architectural styles.³⁷ In order to counteract this tendency, architecture, along with science and philosophy, should dispense with such distractions and concern itself with discovering the 'original reason of the thing'. Once this quest was fulfilled, and the 'origin and primitive cause' stood revealed, what was found at the core 'must be called "type", in architecture as in every other field of inventions and human institutions.' By following his own advice, Quatremère had been able to reduce a 'thousand things in each genre' to three basic 'types': the cave, the temple, and the tent. Each one provided architecture with 'a model of proportions conforming to this first disposition and that, without contradicting its spirit, could embellish its form'.³⁸ As he later explained, the architecture of the ancient Greeks was 'a species of organised being', and as such, it was not subject to reconfiguration.³⁹

His Platonic stance sounds familiar, for it is arguably the case that Quatremère's three original

types and Cuvier's four principal forms were parallel (but not equivalent) constructs. The two men were academic counterparts as well as philosophic kin, serving as permanent secretary of the Académie des Beaux-Arts and the Académie Royale des Sciences respectively, when the controversies over monuments and molluscs began. Their insistence on formal purity (absolutely no 'mixing of the genres') grounded them firmly in the eighteenth century of Lessing's *Laocoön*, at the same time that their inclusive attitude towards history made them key authors of the next. With this combination, noted Carroll William Westfall, Quatremère 'thought that he renewed something enduring'. Instead, without realising it fully, he was 'attempting to recover something lost'.⁴⁰ There was a certain pathos in his project, for what had been irredeemably lost was not a thing, but a trust. It was no longer certain that the old view of the past had relevance for the modern present, for the conceptual models inherited from the classical tradition were being supplanted by new methods of scientific classification, and chiefly by the comparative methods developed by Cuvier.

Based on his belief that 'all the organs of the same animal form an unique system wherein all parts hold together [logically]', Cuvier concluded that it was possible to recognise 'the class, genre, and often the species of animal' by a single bone or even just a 'piece of bone; [a] method that has given him such curious results with fossil animals'.⁴¹ Combining inductive reasoning with a rigorous comparison of extant animal life, Cuvier proved beyond all doubt that extinction had not only occurred, but had occurred repeatedly on a broad

scale. In the process, he almost singlehandedly created a history that had nothing to do with humankind.

When bibliophile Charles Nodier (1780–1844) called Cuvier an 'architect on the ruins of the ancient world', the ancient world he was talking about was not Greece, Egypt, and Rome, or even Sumeria and Babylonia.⁴² He was referring to a geological past that was older than writing and the invention of time, and had existed long before civilisation made its first appearance. Even so, it was still replete with 'monuments of past revolutions', asserted Cuvier, but no human hand had fashioned them: he was referring to the fossil bones of species destroyed long ago by cataclysmic violence.⁴³ To study *these* ancient monuments firsthand, it wasn't necessary to travel to Rome, or even to go to the museums for a peek at a few cleaned-up specimens. The local quarries, pushed to meet the housing demands of a burgeoning urban population, were steadily turning up the provocative relics as they dug down into the earth. For Romantic imaginations, the realisation that the 'bowels' of Paris were filled with 'thousands of beings from races that no longer exist', turned the very foundations of the city into an overcrowded grave.⁴⁴ Paris was haunted by the revolutionary violence of its geological past. In 1789, this prehistoric past caught up with the political present, and changed the nation forever.

In the face of these revelations, classicism had little chance of surviving, at least in the purist form preferred by Quatremère. By the second half of the nineteenth century, references to the reconstructed, prehistoric past had become part of every

educated person's stock repertory, to the point where they could enter the retrospective evaluation of Quatremère's own efforts without a single ironic eyebrow being raised. As the perpetual secretary of the Académie des Inscriptions et Belles-Lettres said of Quatremère in 1877, he

'declared the superiority of restorations that could be raised by the architect who, like the anatomist after Cuvier, found, in the necessary rapport among the parts of the whole, the means to reproduce the structure of an edifice erased from the earth, exactly like that of an organised body destroyed by the repeated secular revolutions of our globe.'⁴⁵

By this time, even Charles-Ernest Beulé (1826–74), himself a classicist who followed Quatremère and Raoul-Rochette (1789–1854) as perpetual secretary of the Académie des Beaux-Arts, could recast the Greek temple as 'a living being' that was 'subject to the laws that govern human nature'. (Implicitly, the 'laws' that governed human nature were the same that shaped human form.) Hence by 'recovering just one of its [a temple's] parts, one can determine its former dimension, style, proportion of its other parts . . . just as a naturalist, being given a fossil bone, reconstructs an antediluvian monster.'⁴⁶

Such references were not 'scientific' in themselves. They were symptoms that a deeper change had occurred in the history of humanity as previously written, including the biblical account. Clear-eyed science had made the discovery, but it was muddle-headed society that had to grapple with the larger implications. Whereas the ponderous

institution that was the collective French Academy toed the conservative line, younger establishments were more willing to test the methods that had so vividly re-created the vanished 'panorama of the past'.⁴⁷ Anthony Vidler, Alberto Pérez-Gómez, Westfall and numerous others have remarked on the impact of comparative methods of classification on architectural theory, an impact made most visible in the work of Jean-Nicolas-Louis Durand (1760–1834). Now considered one of the primary theorists of architectural 'rationalism' (a term best understood in contradistinction to Quatremère's 'classicism'), Durand was professor of architecture at the mathematics and engineering-oriented Ecole Polytechnique, then located just a short distance from the Muséum d'Histoire Naturelle (Fig. 4, upper left). 'Type' was as important a concept to him as it was to Quatremère, but he understood it as a functional rather than philosophical designation. Used by him as a compositional tool, Durand's notion of 'type' became the basis for a utilitarian approach to architectural design, offering a modular method that was 'scientific' in its ahistorical extraction of a built object from contextual considerations.

His ideas were disseminated in a heavily illustrated teaching text, *Précis des leçons d'architecture données à l'Ecole Polytechnique*, a work that appeared in several editions and numerous translations between 1802 and 1840. The success of his analytical approach was a harbinger of things to come, including the emergence of a rebellious group of academically trained architects, dubbed 'Romantic-Rationalists' by David Van Zanten. The radical ideas of this young coterie, whose chief

members were Félix Duban (1796–1871), Louis Duc (1802–79), Léon Vaudoyer (1803–72), and Labrouste, represented an extension of – as well as a distinct departure from – Durand’s clinical system of classification. Although they sustained a belief in the internal logic of architectural structures, they also immersed their ‘rationally’ considered subjects in the ‘romantic’ contingencies of human history.⁴⁸ All winners of the Prix de Rome, they challenged the traditional view of classicism from inside the academic system. In 1830, it was their unofficial leader, Labrouste, who forced the Académie des Beaux-Arts to face a temple that was no longer ‘eternal’ but conditioned by a new comprehension of time. Yet his refusal to envisage the history and development of architectural monuments in terms of ideal abstractions was more than just an aesthetic mistake or formal failure. Rather, as Neil Levine noted, Labrouste’s reconstructions of the colonial Greek temples at Paestum ‘undermined the academic foundations of family, property, and religion’.⁴⁹

What was the nature of the threat? Under most circumstances, it seems unlikely that any drawings of an ancient Greek temple, so long as they were prepared in good faith, could carry such revolutionary (and patently non-architectural) implications. It must also be admitted that adjectives such as ‘deadly’ and ‘dangerous’ are not common to most discussions of molluscs.⁵⁰ For many interested observers of both debates, however, molluscs and monuments held enormous destructive potential, not for what they were in themselves but for what their growth represented – a groundswell of uncontrollable forces that could disrupt the

‘natural’ order which governed their everyday world. Each political revolution had forced the city of Paris to rebuild itself from the ground up, and each time Parisians were forced to reevaluate themselves along with their most basic beliefs. If the past had relevance for the present, it was on this fundamental level. The problem was that the ground itself was stuffed full of surprises.

The meaning of molluscs

In his debate with Cuvier, Geoffroy had hinted that his morphological approach to animal anatomy could extend to the reform of the social body. ‘The points to resolve are vital’, he stated. ‘I could only be sensitive to their influence on the moral perfection of society.’⁵¹ His audience understood what he meant. Molluscs were at the high end of the lower orders, the newspapers noted. Being malleable, mobile, and prolific, they might easily inflate in size and numbers. But if it were also true that underneath it all, molluscs resembled fishes, then why couldn’t they also transform from invertebrate to vertebrate (think Lamarck, not Darwin), thereby moving up a zoological hierarchy that placed mammals on top and put human beings at the very apex? Their hard, external husk wasn’t the problem; rather, it was what was lurking inside (Fig. 9). Once these bulging, drab, unlovely creatures came out of their shells, it was unclear what would happen: the promised delights of a new utopia, or the Rabelaisian tortures of hell-on-earth.

What goes up, must come down. When it did, something else could rise up to take its place. On the eve of the Revolutions of 1848, Alphonse Esquiros looked back to the French Revolution of



1789, and stated the case directly: 'unity' was the 'principle for which the revolution has fought for more than a half-century', and the 'genius fore-runner' of the political struggle for social unity and the abolition of class was none other than Geoffroy.⁵²

For Esquiros, radical shifts in the social body could be bolstered by the example of animal morphology. For others less open to social reform or who became tired, perhaps, of constant political change, Geoffroy's views held little appeal and were even damaging to the 'well-being of

society'.⁵³ The anatomical analogy cut both ways: if the absence of class boundaries made social unity possible, it was also true that forcing the situation might yield horrible results. As Geoffroy's experiments in teratology confirmed, monstrosities, or creatures whose bodies obeyed no known order and whose very existence defied the harmony of nature, were the perverted products of extreme changes in the (socio-political) environment.⁵⁴ What a relief that Cuvier, who had cut his proverbial teeth on the anatomy of molluscs, could meet Geoffroy on his own terms and still refuse to accept his arguments as valid. Instead, *Le Temps* pointed out, Cuvier upheld the very 'old and important principle' that each part of a well-functioning body should keep to its proper place. The journal was referring to his principle of subordination, wherein, for example, the size and shape of the teeth indicated structure of the jaw indicated type of digestive system indicated mode of obtaining and expelling food indicated manner of life; no one part could be altered without affecting the whole.⁵⁵ There was a certain role that 'the animal must play in nature', the editorial continued. Its implication was that this role, be it naturally or socially determined, was not subject to negotiation.⁵⁶

Whether Cuvier liked it or not, his understanding of the 'laws' that governed animal anatomy could be utilised in the struggle over social reform. As Barry Bergdoll has pointed out, 'liberals and conservatives alike ransacked history – both human and natural – to reveal a structure that would justify their vision of the present as one naturally evolved from the past.'⁵⁷ Even in England among anatomists who were watching their debate, the

Figure 9. Detail of title page, Old Nick and J.-J. Grandville, *Petites misères de la vie humaine* (Paris, Fourier, 1843) (photograph, Special Collections, University of Chicago).

partisan lines remained consistent: Radical Robert Grant defended Geoffroy, whereas Peelite Robert Owen championed Cuvier.⁵⁸ The point should not be overly simplified; political opinions and scientific thought are not mutually determined, and one does not dictate the other although their interests may be intertwined. Still, Dorinda Outram's biography of Cuvier has made it clear that his institutional authority, which extended far beyond the Muséum itself and included the presidency of the Comité d'Instruction Publique after 1819, helped to reinforce his scientific views.⁵⁹ Consequently, Cuvier's detractors saw him playing politics more than advancing science, even as others applied Cuvier's arguments to serve political ends and drew the reductive conclusion (hierarchical order in nature = social hierarchy is natural). These were meaningful responses in themselves, and predictable under such volatile circumstances. Moreover, there is no question that Geoffroy volunteered his own arguments to support the opposing liberal side, and that he viewed their doctrinal differences as an extension of personal politics. Cuvier 'had no time for large ideas', Geoffroy stated flatly in a private communication to Doctor Etienne Pariset shortly after Cuvier's death. Instead, his rival 'wanted to be rich, wanted a carriage, wanted finally to join the aristocratic portion of society', and to this end, he 'cultivated powerful men'.⁶⁰

Geoffroy was not alone in his evaluation of Cuvier as more of a 'courtier' than a naturalist.⁶¹ He shared this belief with many others, including Jean Reynaud (1806–63), a prominent journalist and philosopher who was also co-editor with Pierre Leroux (1796–1871) of the populist *Encyclopédie*

nouvelle. The 'new encyclopedists', a group that included publisher Edouard Charton, engineer Frédéric Le Play, medical 'alienist' Achille Requin, and art critic Théophile Thoré, emphasised the practical rather than mystical side of Saint-Simonist teachings, and favoured liberal social and urban reforms. They counted Geoffroy among their allies, and saw his 'anatomical philosophy' as a way to strengthen their cause. 'In zoology,' wrote Jean Reynaud, 'the methodical consideration of bones' has illuminated 'all living organisations.' In particular, he continued, 'it seems to us that the consideration of these large masses of stone . . . might throw certain parallel lights upon political geography, administration, and history.' For him, the methods of comparative anatomy were as compelling for their potential application to human institutions as for what they had already revealed about the organisation of prehistorical life.

In turn, Geoffroy considered them 'profound philosophers', who were committed to studying 'the character of Humanity in all its transformations'. If they worked to advance his views, it was motivated by a mutual desire to see 'continued progress in the knowledge of humanity'.⁶² Neither professional favours nor personal friendships had anything to do with it, although the Reynauds and Geoffroy Saint-Hilaires were very close.⁶³ It thus seems fitting that the first and last volumes of the eight-volume *Encyclopédie nouvelle* contained important articles written by members of their respective families: 'Architecture', 1834, written by Léonce Reynaud, Jean's older brother, and, eight years later, 'Zoologie', 1842, written by Isidore Geoffroy Saint-Hilaire, Etienne's son.

It was with this particular article for the *Encyclopédie nouvelle* that Léonce threw molluscs into the architectural fray stirred up by his colleague Labrouste. Even so, as Robin Middleton has pointed out, his entry was 'not concerned with style, or, surprisingly, with social systems'.⁶⁴ Rather, it was devoted to the science of building and the use of materials, topics that might have seemed bland had the timing of this piece not coincided with two parallel controversies that invested both subjects with social import. It is helpful to know that the ideas outlined in this article culminated two decades later with his two-volume *Traité d'architecture*, 1850–58. This was a teaching text developed out of his lectures at the Ecole Polytechnique, a school that had kicked him out as a student on suspicion of radical anti-government politics. He had subsequently done well for himself, not only succeeding Durand as professor of architecture at the Ecole Polytechnique but also becoming a professor at the Ecole des Ponts et Chaussées (School of Bridges and Roads). Léonce explained that he had given 'a large place to science' in this treatise, in order to 'show that the principal forms of our Architectural system are eminently rational in their fundamentals.' In his opinion, this was the principal contribution of the work. It was his hope that the study of beauty, together with 'considerations of a purely scientific order' would together guide the architect 'to discover the truth, the highest goal'.⁶⁵

By comparing monuments to molluscs in an essay on architecture, Léonce surely intended to remind his readers of the academic confrontations over the same subjects, and to indicate his own

position *vis-à-vis* the ongoing socio-political debates at the same time. Léonce was not his brother, and it cannot be assumed that their friends, associates, interests, and political sympathies were the same. Of the two, Jean was more outspoken and engaged in matters of social reform. On issues relating to architecture, zoology and history, however, they were clearly in accord. For professor Léonce and editor Jean, the 'destiny' of humanity was 'intimately connected' with its architecture.⁶⁶ Both Reynauds understood man-made monuments as 'the shell of human society in evolution', Van Zanten observed, and the city as a whole bore witness to its growth.⁶⁷

It is difficult to appreciate the originality of their interpretation, partly because social histories of architecture (including this very study) work out of the basic premises that informed such a view. To restore a sense of the critical context, the opinions of Quatremère again provide a useful foil. 'The exterior form of creatures,' he wrote, is 'nothing but the envelope around the infinite marvels that make up the organisation of bodies.'⁶⁸ There was no necessary relationship between surface and structure, no vital link connecting social bodies to their built works. As a result, buildings could stand as fixed forms that had no obligation to respond to the people who lived with them. By contrast, Léonce argued that buildings *must* change over time, and construction should acknowledge their temporal constraints.⁶⁹ 'Due to the mobility of our customs,' he stressed, a private residence should not be as 'solid' as a public building. A house 'will not appear satisfactory for long, even as the other might render the same services more or less for a

succession of generations.' And, he continued, 'it is not only from one class of buildings to another that it is appropriate to observe differences in solidity.' Once an architect had accounted for large groups, there was 'still an infinity of nuances to appreciate in each category, following the circumstances where they are placed.'⁷⁰ Out of responsibility to his art and craft, an architect had an obligation to understand buildings according to a context established by use as well as by locality.

The same principles applied to the development of urban form, but determined by a people's collective character rather than a person's individual needs. 'It is certain,' Jean explained, 'that as the state of populations which occupy cities change ceaselessly, cities also tend to transform themselves continually.' Hence, an urban population should find the resources to support 'the natural renovation of the organism' and let it 'metamorphose' freely.⁷¹ One recalls that as further evidence of 'unity of organisation' [emphasis in original], Geoffroy had likewise seen a cohesive purpose binding the buildings of Paris in a 'unity' of social form and internal function, despite the fact that they appeared unrelated from the outside. Underneath and inside, there was surely a 'certain resemblance among all beings,' Geoffroy believed, that joined all forms of life together 'from interior to exterior.'⁷² Otherwise stated, the growth of a city expressed changes in the social body it sheltered, and perhaps did even more: as D'Arcy Thompson pointed out in his classic study of 1917, *On Growth and Form*, 'it is the shell which curves the snail and not the snail which curves the shell.'⁷³ Once it has made its home, the snail is shaped by

it: it becomes the malleable product of its own material environment.

Molluscs were meaningful in early nineteenth-century France, not as a model of social organisation or as a pattern of urban development, but as a complex relationship between the progress of life and its physical expression. As old as the history of the earth, these small creatures lived and died in profusion, procreated with equal abundance, and dispersed themselves globally. Taken on an individual basis, the overall shape and 'lines of growth' inscribed in a shell created a 'lasting record of successive stages of form and magnitude',⁷⁴ Thompson explained. Taken as a group, their shells were the truest record of geological time. Because architectural shells were also durable and plentiful, they assumed the equivalent role: they became historical records. Buildings remained after social groups dispersed or disappeared, and sometimes even after whole civilisations died out. For Edgar Quinet, Herder's translator and a regular member of Geoffroy's *salon*, architecture could be understood as the skeletal remains of lost civilisations known only through monumental ruins and not through living memory.⁷⁵ As concrete documents of the past, architectural remains could illuminate human history; as flexible shells that grew along with the social bodies they sheltered, they could help define their future.

Sensible as this reading may sound, it was not an entirely reassuring vision of things to come. Anthropocentric allusions to man-as-measure had dominated architectural treatises since Vitruvius's canonical *Ten Books on Architecture*.⁷⁶ By choosing the shells and soft bodies of molluscs as his central

metaphor, Léonce offered a highly polemical challenge to this tradition. His intentions could not be mistaken; in his next article for the *Encyclopédie nouvelle*, he explicitly refused Vitruvius's mimetic interpretation of the Orders (the 'masculine' Doric, the 'matronly' Ionic, and the 'maidenly' Corinthian) along with any proportional or symbolic system based on the historically privileged position occupied by man.⁷⁷ Instead, by elevating a humble invertebrate to the status of an ideal form, he implied that the 'spineless' bodies of the powerless but prolific lower classes merited as much consideration as stiff-backed aristocrats and other members of the upper classes. These huddled human masses were the future of society, and their unsung labours were the very substance of history. This was a history that had not been written in words, put into books or stored in libraries, but nonetheless was made legible and manifest in mundane built works such as roads, bridges, and housing. The practice of architecture, for the sake of its own survival and relevance to the modern world, should concern itself less with high art and more with everyday building. But even as the soft body of a mollusc yielded to the shape of its shell, radical changes in the social body must begin with architecture, lest they end with it, leaving only empty dwellings as the desolate reminders of once-vital, long-dead ideals.

The 'profound' comparison between molluscs and monuments has had lasting repercussions. On the academic level, for example, palaeontologists Stephen Jay Gould and Adolf Seilacher, both specialists in snails, have continued to relate animal anatomies to architectural objects,⁷⁸ even as art

historians have not failed to observe the analogy and its persistence in building imagery.⁷⁹ By replacing Renaissance man with a revolutionary hope for a unified, classless society, Léonce confronted the ideal aspirations of architecture with the real conditions of building, raising questions that have yet to be fully worked out in theory as in history.

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 4. Georges Cuvier, 'Mémoire sur les Acères, ou Gastéropodes sans tentacules apparens [sic]', *idem*, *Mémoires pour servir à l'histoire et à l'anatomie des mollusques* (Paris, Déterville, 1817), p. 5.
 5. See Toby Appel, *The Cuvier-Geoffroy Debate* (New York, Oxford University Press, 1987). The connection between Reynaud and the Cuvier-Geoffroy debate was first pointed out by David Van Zanten, *Designing Paris: The Architecture of Duban, Labrouste, Duc, and Vaudoyer* (Cambridge, MA, The MIT Press, 1987).
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 7. In 1795 (year 3 of the Revolutionary calendar), Cuvier and Geoffroy published a series of collaborative papers in the *Magasin encyclopédique*, including 'Mémoire sur les rapports naturels du Tarsier (*Didelphis Macrotarsus* Gm.)', vol. 2, pp. 147–54; 'Histoire naturelle des orang-outangs', vol. 3, pp. 451–63; 'Mémoire sur une nouvelle division des mammifères, et sur les principes qui doivent servir de base dans cette sorte de travail', vol. 6, pp. 164–90. Cuvier's importance to the formation of the modern episteme has been most notably examined by Michel Foucault, *The Order of Things* (New York, Random House, 1971), and *idem*, 'La situation de Cuvier dans l'histoire de la biologie, II', *Revue d'histoire des sciences*, 23 (Jan–March 1970), pp. 63–9; discussion, pp. 70–92.
 8. Georges Cuvier, 'Sur un nouveau rapprochement à établir entre les classes qui composent le règne animal', *Annales du Muséum d'histoire naturelle*, 19 (1812), pp. 73–84.
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11. *Ibid.* p. 49.
12. *Ibid.* note 1, p. 198. Cephalopods (nautilus, squids, cuttlefishes, and octopuses) feature a linearly chambered shell, whereas the coiled shells of gastropods (snails and slugs) are usually spiral. See Richard C. Brusca and Gary J. Brusca, *Invertebrates* (Sunderland, MA, Sinauer Associates, Inc., 1990), p. 696, who note that 'classification of species in the class Gastropoda has been volatile, undergoing constant change since Cuvier's time.'
13. Georges Cuvier, 'Considérations sur les mollusques, et en particulier sur les Céphalopodes' (read before the Académie Royale des Sciences on 22 February 1830), *Annales des Sciences naturelles*, 19 (1830), pp. 241–59, repr. in Cuvier, *Principes*, p. 50.
14. *Ibid.* pp. 59–61.
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Part 3

Issues of materiality

The alleged materialism of modern culture does little, it seems, to strengthen our confidence in the substantiality or the permanence of our architecture. Indeed, the lack of precisely these qualities in the modern environment is regularly adduced as the source of existential anxiety amongst its inhabitants. The three papers presented under the present heading explore, from different standpoints, the newly emerging parameters of architecture's territorial and temporal status.

Helmut Lethen re-examines architectural and anthropological positions adopted during the 1920s so as to question traditionalist assumptions that the intimacy, the sincere and unmediated contact of human beings, implied in an architecture whose safe and warm enclosure eliminated the need for a 'cold' personal skin, reflected an intrinsic need of 'human nature. It is suggested, on the contrary, that, in the words of Helmuth Plessner: "Man is artificial by nature"'.

Brian Hatton would like to see an architecture of radical transgression in which architecture's one secure principle, the wall as positive separator between *either* and *or*, divested of its instrumental materiality, will finally be offered up as an object for disinterested contemplation. Violation of the material taboo in which it has been rooted becomes architecture's act of creative purification.

Specifically in relation to architectural ruins, archaeological investigations and conservation of the inherited remnants of previous cultures, Brigitte Desrochers elaborates the theme of an attitude to artefacts by which their subjection to processes of change and decay across time is intrinsic to the values attached to them. Archaeologists' transferred attention from the exclusive search for 'high art' discoveries to the very dust of time (which their predecessors would clear away as fast as possible), reflects a more modest approach to architecture in which monumental, unchanging permanence matters less than the authenticity of the passing moment.

Between the barrier and the sieve: finding the border in the Modern Movement

Helmut Lethen

This is the text of the opening paper presented to the Fourth International Conference of DoCoMoMo International (Documentation and Conservation of Modern Movement Architecture) in Bratislava, Slovakia in September 1996. An earlier version was published in H. Lethen, *Verhaltenslehren der Kälte: Ledensversuche zwischen den Kriegen* (Frankfurt am Main, Suhrkamp, 1994).

The formula for the border as 'barrier and sieve' does not come from a theory of architecture. I found it in a recent book, written by an American medical expert, on the functions of the skin. After I had studied this doctor's reflections on skin as border, they continued to haunt my thoughts even as I began to think about the function of political borders and other spatial divisions in architecture. With this in mind I should like to begin with a speculative thought experiment using the skin as a model of the border – of national border and regional border as well as the constructed border surfaces in architecture.

The skin

In his book *The Skin Ego/Le Moi-peau*,¹ the French psychoanalyst Didier Anzieu considers the problem of the border between the familiar and the foreign. Ego formation takes place, according to Anzieu, at the borders of the body, the cover behind which the ego is at home. As a network of various sensory organs the skin registers touch, pain, and sensations of warm and cold. Skin is an organ of perception. The border surface of the skin is a zone where the mental life meets with its

biological and social reality. It is a protective cover for the individual and a place of exchange with others. It protects our inner world from outside disturbance, showing in the construction of its surface, colour and scars, the results of external influences, which also reveal an inside. Based on various functions of the skin, the skin-ego has, according to Anzieu, first and foremost the function of a *pocket*, which contains in its interior the wealth of experience from nursing and the care of its mother. Its second function is as *border surface*, which forms a barrier to the external world, protecting from penetration as expression of desire and aggression on the part of other people and objects. Its third function is as a primary tool of *communication*: the epidermis forms a sensory perceptive surface on which the traces of meaningful relations are engraved.

The question remains: can these three skin functions, which cultivate security, protection and exchange, be transferred to other border surfaces? The skin as model of a border leaves decisive questions unanswered. How does the individual armour against interventions in his or her 'skin space'? How is personal space guaranteed? Who regulates

the balance between proximity and distance in the intersubjective communication between people?

Skin cannot exist without armour. The human child cannot survive within its skin. From birth on, it needs a cultural context that envelops him or her in artificial border surfaces. Does this objection already refute the idea of skin as an ideal border surface?

Architecture as border art

The period of time in which we locate the architecture of the Modern Movement is characterized by conflicting tendencies: incalculable migration movements, ranging from migrant workers, tourism and rural exodus to troop movement, exile, foreign occupation and streams of refugees. The experience of border crossing is so elementary that Salman Rushdie² places the 'perspective of the migrant' at the centre of his focus. The experience of 'uprootedness and separation', the experience of forced departure from a life space, the crossing of its border, seems to be the basic experience of this century. This observation is clearly linked to another one: this is a century in which the most rigid borders were drawn – from the fixed trenches of World War I to the Atlantic Line of World War II; sharp borders between zones of trust and zones of distrust, between friend and foe; between 'classes', nations and races.

There appears to be a fatal regularity: turbulence in the traditional social structure of the population, new ethnic mixes, the need for mobility in the work sphere, the dispersion of traditional power structures, the facilitation of traffic across the borders – these tendencies produced and met with

vehement resistance. In the midst of these turbulent migrations, individuals and segments of population seek to establish an identity with the slogan: '*I draw a borderline, therefore I am!*'

This of course seems to be a paradox inasmuch as the same actors who insist on such rigid borders are the ones who consistently violate the borders drawn by others, by mobilizing vast armies just to place a flag in the ground somewhere at a great distance from their point of departure. One could almost conclude that the greater the desire to define one's own identity as a spatial zone of trust by drawing impermeable borders, the greater the probability that the neighboring borders will be violated in a colonizing movement.

Just how did these architects of the Modern Movement behave in this force field in which the border is drawn or blurred? If we look at their architectural manifestos, we soon get the impression that they were on the side of the transgressors. They built for 'nomadic' mobile inhabitants and for impassioned border-crossers. Architects of the Modern Movement were intent on building *permeable borders*: transparent walls, mobile installations and transportable houses. They even designed buildings that did not resist the wear and tear of time, but rather incorporated this inevitability in their structure. During the 1920s in Berlin, houses conceptualized by the city planner Martin Wagner anticipated a 50-year period of deterioration: after this period had passed, if the house was written off financially, it was to be torn down. The architects of the Modern Movement did not build fortresses or bunkers, in short: buildings with impermeable borders. This makes the

conservation of their permeable structures so difficult.

The wonderful concept of permeable borders was, as we know, highly debated. Rather than raise the issue of spatial borders, I should like in the following to emphasize a problem that played a central role in the battle of the anti-modernists against the new architecture: the relationship between architecture and the borders of human constitution. The argument of the opponents is familiar: the transparency, brightness and coldness of the new constructions placed too much duress on the human constitution. The inhabitants of the houses were members of an organic community and not nomads. They were shaped by the desire for warmth, rootedness and solid walls of protection, which the architect should take into account. There is a right to a lack of transparency and darkness. Only in this way could humans ground themselves in the warmth of symbiotic units. And they also are aware of the cosmopolitan laughter of some modern architects over the 'retrograde' views of 'cave dwellers', who mockingly called them 'Troglydites'.

The resistance clearly is not broken by the enlightened laughter. The problem lies in the differing concepts of 'natural' human borders. During the 1920s, the period on which I shall concentrate, the resistance to the new architecture was especially pronounced. The opponents of the Modern Movement referred to 'human nature', and it is interesting to investigate what concept of man the altercating parties used as a point of departure during these years. In the following I shall concentrate on the theory of the philosophical anthropologist Helmuth Plessner. Although it

is a fact hardly known to the international discussion, he published material during the mid-1920s in which the problem of the border was brilliantly linked to the question of the nature of humanity. Plessner coined the phrase: 'Man is artificial by nature!'

I should like to address this phrase today, because it can be found in some of the New Construction manifestos of Hannes Meyer, Bruno Taut and Martin Wagner at the end of the 1920s in Germany. Before doing so, I should like first to look at the perspective on this problem offered by two cartoons published in Germany in 1929, as a way of reducing the abstractness of these ideas.

New construction and human constitution

In October 1929 the cartoon shown in Figure 1 appeared with the title 'A palace tour in the year 1979'.³ Is this a remarkable prognosis of the fate of Modern Movement monuments in the post-modern era? In any case an avant-garde monument appears here as antique object. It appears to be one of the objects of cultural inheritance successfully preserved by DoCoMoMo and yet a nightmare. For it appears to be an inaccessible toy and clearly separate from the life space of the viewer.

The cartoon risks a look back at the present. A flock of visitors stands before a deserted architectural monument in which elements of Rietveld and Bauhaus are combined with designs of the Soviet constructivists (something like Lenin's speech rostrum) and with characteristics of the newly opened Wannsee beach resort in Berlin. While the building itself appears to belong to the

Figure 1.
'A palace tour in the year
1979.' 'Uhu', 1929.³
(Caption: 'Und dies hier
ist die berühmte alte,
neue Sachlichkeit', 'And
this is the world-famous,
old/new Sachlichkeit').



class of dwellings in which one learns to freeze, the flock of viewers appears to have taken on a relaxed attitude, demonstrated by their summery dress and casual demeanor. Dressed somewhat anachronistically for the fashion standards of 1929, these people occupy the future. And from there they regard what was built for the sensibilities and mentalities of the future as outdated and obsolete.

Soon the suspicion arises that what we have before us is a clairvoyant prognosis: a group of people dressed for the postmodern in eclectic fashion statements quoting costumes taken from light opera and slapstick films. All are casually gathered around an idol of modernity that has lost its appeal and now is of only antiquarian interest. The clothing of the viewers is no longer determined by their work.

Similarly, the building constructed with the idea in mind that 'form follows function', has lost its place in the work sphere and now assumes a space in history as a sacred idol of modernity.

'Things made of glass have no aura' Benjamin rejoiced.⁴ In hindsight all transparent surfaces appear opaque; all openings are closed; there are no permeable borders. While the casual clothing of the visitors shows a lot of skin, they are standing before an airtight sculpture that doesn't breathe. What once was meant to be a shrine of mobility now stands before us as a relic (drift block) left behind by a previous ice age. We are standing before a monument whose inner logic has to remain unknown, because it is not transparent.

And the group of viewers looks back mockingly, just as Tom Wolfe in fact did exactly 50 years later

in looking back at the 'glass boxes' of the Silver Prince Walter Gropius:

'Pipe railings, ramps, hob-tread metal spiral stairways, sheets of industrial plate glass, banks of tungsten-halogen lamps, and white cylindrical shapes, it looks like an insecticide refinery.'⁵

The inhabitants, who, according to Wolfe, are 'driven to the edge of sensory deprivation' by the transparency and cold of it all, attempt to:

'bury the obligatory white sofas under Thai-silk throw pillows of every rebellious, iridescent shade of magenta, pink and tropical green imaginable.'⁶

Tom Wolfe knew the fate of the rebellious inhabitants:

'But the architect returned, as he always does, like the conscience of a Calvinist, and he lectured them and hectored them and threw the shimmering little sweet things out.'⁷

As we see in 1929, the little sweet things had gathered together to mock the document of the Modern Movement as a cold project, which they already seem to have banished. A suspicion arises. Is it really a clairvoyant prognosis, when fashions, that were *passé* by 1929 standards here express the wish that, in future, the dictates of modernity would again make room for more feudal, more impractical and less streamlined attitudes? Doesn't the truth of this prognosis lie simply in its trust in the repetition of the repressed?

It would seem more useful, not to begin with a prophecy, but rather to establish that the reflections upon modernity in 1929 turn upon the contradiction fixed in the drawing – a contradiction that is played out in the form of a prognosis over a temporal axis. In 1929 reflections upon the ‘cold-boxes’ of the Modern Movement, the contradiction between the frigidity of Calvinism and the heart-warming shimmering sweet things, were just as apparent as today. Then, as often today, the consideration of modernity was subjected to a *scheme of polar oppositions*. Of course, the cartoon overlooks the nuances, the shadings, the climate of partial shade.

The cartoon *does not* succeed in communicating a central concern of some of the Bauhaus architects: the attempt to link elements of eccentricity with functional housing, characterized by transparent borders and surfaces. However, in no way does the cartoonist place himself on the side of the reactionary adversaries of Bauhaus architecture, who are also not represented by the viewers. His drawing does reflect the contradictions that architects then were painfully aware of. He represents the contradiction in a nightmare of every representative of the Modern Movement: namely, the possibility that their buildings could become the object of antiquarian interest, which means that their borders are closed to the future; that their building could only fill the function of the cult object: that is, a consideration of memory storage.

The second cartoon (Fig. 2) concentrates on the question of whether the representatives of the Modern Movement don’t overtax the human condition with their inventions of movable walls

and ‘cold’ furniture. It asks: Has the project of modernity overtaxed its own originators?

‘The tubular steel chair’ I read in Sigfried Giedion’s book *Mechanization Takes Command*,⁸ is as truly part of the heroic period of New Architecture as are the transparent shells of glass that replace brick support-walls.’ In 1925, Marcel Breuer had produced at the Bauhaus the first tubular metal chair out of Mannesmann steel pipe, and in 1926 the large lecture hall of the Dessau Bauhaus was furnished with tubular chairs; in 1928, they were mass-produced.

This drawing takes a look at the psychological costs of the ‘heroic period’ of the Bauhaus. The architects of the Modern Movement demanded apartments ‘without fetish’ – and here stands a prime example of functionalism as a spatial fetish. Before it – reverently – one of the perpetrators of that heroic period, which probably fell some time in his youth. Has he regressed? *Sitting in an outdated comfortable chair*, packed between four pillows, his feet on a fifth as if he had to compensate for the cold of his own creation! The tubular metal chair, designed for a ‘nomadic existence’, as once was said, or for ‘mobile people’ as the new director of the Bauhaus, Hannes Meyer, put it. And in front of this nomadic apparatus, the perpetrator as a couch potato?

In the 1940s, the philosopher Günter Anders was to see in this attitude an image of Promethian shame. Human beings are ashamed of themselves because they cannot succeed in attaining a synchronization of their own bodies with their own creations. What are we seeing? An agent of modernity is chilled here in viewing his own exhibit.



Figure 2. Walter Trier, the Inventor of Steel Furniture, 'Uhu' 1929.⁸

If he wants to survive, then he will have to bring his own project in line with his practised existence. The borders of the spaces that the cartoon shows allow many perspectives. The curtains are missing, and as for plants, only a cactus and a very leafy shrub are allowed. The flowers have moved to the biggest pillow, which cushions the inventor against

the cold. Because women were considered a source of warmth – according to male tradition – relief could be provided in this functional room by the framed picture of a woman next to the window. Is it a woman in fur, as in Kafka's *Metamorphosis*? The woman is behind glass, and the inventor has turned his back towards her. In awe he seems to

copy his heroic invention on paper. Is this the picture of a person, who wants to remain a 'skin-ego': because he does without his steel armour, does he need to be embedded in pillows in order not to be damaged by the coldness of the world?

Does the cartoon point only to the banal experience that private practice and professional design might be contradictory? Or does the criticism aim at an anthropological factual situation? Does it maintain that the project of modernism generally asks too much of human nature because it does not take seriously the desire for borders offered by caves that are not transparent?

I assume the friendly scepticism presented in this caricature is something with which the architects of the Modern Movement always needed to take issue. And I assume that the opponents could be sure that their polemics were supported by most contemporary philosophers who made statements about human nature.

It seems all the more important to point to the writings of an anthropologist who made statements about human nature, with which architects could have productively taken issue. For this reason I shall briefly sketch what Helmuth Plessner presented about human nature and the necessity of boundaries in the 1920s.

Plessner's image of man as border being

The battle over the Modern Movement probably took on different contours in various countries. It can be shown in the German context that the arguments of the opponents always oriented themselves toward the image of man as a 'communal' being, who makes a claim for his right

to rootedness in a stable border horizon, which went against the processes of modernization. The 'community' seemed to them to be the natural way to construct larger units of population. This was sharply distinguished from the artificial construction of the 'cold society'. The anthropologist Helmuth Plessner intervened in this traditional field of conflict. Amidst the turbulences of the modern era, in which the old orientations disappear, one can no longer orient oneself towards the ideal of the community. Man needs to come to terms with the 'coldness' of society. In order to enhance this, Plessner develops a kind of behavioural attitude of coldness. This is supposed to clarify an elementary problem of cohabitation. It has to do with behavioural techniques 'with which people come closer without hurting each other, or with which they move apart without offending each other by indifference'. For him, the first step consists in accepting the artificial nature of society as the only possible environment of behaviour. Only then can the 'forced distance between individuals be gentrified as distance, the offensive indifference, coldness and coarseness of estranged living be made ineffective through forms of politeness, deferentiality and attentiveness and a closeness all too great be avoided'. For according to Plessner, humans need one thing above all: distance. In order to maintain this man needs one virtue: he must keep the balance between the regressive desire to fall back into symbiotic structures and the necessity to develop his autonomy in his public role. The community tries through the tyranny of intimacy to destroy the necessary border zone of personal space. Man can only realize his

full potential in the strangeness and anonymity of society. 'Distance', 'politeness' and 'diplomacy', these are the 'magic words', which are also to have validity in human relations. Nothing for Plessner is more ruinous than the claim to 'authenticity' in every situation:

'Sincerity is not the guiding rule for estranged persons . . . After a short collision the coldness of outerspace should settle between them.'¹⁰

The considerations published by the American sociologist Richard Sennett¹¹ during the 1980s put forth that suffering in society does not, as is often claimed, stem from the 'coldness of estrangement', but from the friction caused by too great a proximity: that is, from the 'tyranny of intimacy'. These are ideas that were already formulated by Plessner in 1924. He bases his argument on the idea that the artificiality of social structures shapes the 'natural' space for human development. Only in the artificiality of the symbolic order that a culture erects around a person can the way to expression be found.

However, these ideas and behavioural directives should be regarded with some reserve. How, one might object, can a person be a cultural being by nature? Plessner had originally studied zoology before turning later to philosophy. Only as an anthropologist did he ground the 'nature' of man in the standards of knowledge that the human sciences then offered. His argument does not surprise us any more today. It runs: man is born into a privileged and eccentric position *vis-à-vis* his environment, especially when compared with the

animal kingdom. Helpless and without defense against the outside world, the pure skin-ego needs the artificiality of culture from birth onwards in order to survive. Man continuously develops object structures that protect him, and in which he develops himself: the family, his craft, weapons, clothes, the symbolic order of images, languages, myths, religions, sciences and institutions.

'Artificiality in acting, thinking and dreaming is the inner means by which man stands in harmonious relation with himself as a natural being.'¹²

The artificiality of modern society does not by any means contradict human elementary needs, as the apostles of community thinking would have it. Moreover, it is the necessary condition for human beings, who are cultural beings by nature. From this evolve the conditions for the psyche, whose expressions are subjected to the artificiality of the symbolic order.

'The self must first be lost in the foreign medium (of language, writing, images, or music), in order for it to be found again.'¹³

Plessner does not deny here that man has a longing for 'community'. Yet he requires that man learn to balance on the borderline between legitimate desires for community and the necessity to realize himself in civil society. Thus when Plessner maintains that man is a border phenomenon, he means that man has always had to balance on the border between the necessities of life in the political sphere and intimate spaces. He must realize

his freedom in the strangeness of the public, for this is the only one that offers the open horizon of his existence. He must make use of conventional rules of play; he needs the masks of social roles as an artificial means for regulating closeness and distance. The mask belongs to his gestural language of the public sphere.

When Plessner speaks of the public sphere in the 1920s, then he is speaking very realistically of a public sphere grounded in violence. Although the concepts 'balance', 'play' and 'tact' are important for him, he does not forget the realities of civil war. He is not guided by the notion of an anthropology for a peace-loving communal sphere, because he does not see this anywhere. He reckons with aggression, and that is why anthropology is forced to construct man as an 'accountable subject' linked to a violent world. With this he departs from the notions that man is a playful existence on the border between peace-loving community and a crude public sphere. Both spheres are grounded in violence. This political anthropology is also shaped by Thomas Hobbes' view of man. Plessner assumes that the battle-ridden political sphere is not a foreign, coincidental, or external situation of being, but rather one with the ability to draw boundaries between friend and foe, which belongs to the essence of man from the beginning. He must conquer an area located between the life world that has already become familiar, and the foreign one that is inimical. Because the sphere of familiarity is not to be understood as one that is by nature a protective border, it must be created artificially: that is, also by violent means.

So where do these thoughts lead us? They have taken us to a place that is far away from the ideas of the skin-ego. For a while, it seemed as though Plessner wanted to suggest a playful definition of the border. If we think back to the second cartoon, to the arguments of the opponents of the Modern Movement, we can refer to this anthropologist, for whom the essence of man did not consist in remaining in the warmth generated by symbiotic communities, but in the risk of taking a step into the coldness of modern society. Plessner seemed to support us in arguments for mobility, border-crossing . . .

All the more surprising that we find a critique of Bauhaus architecture in his writing *Limits of Community*.¹⁴ Because his critique primarily focuses on figures who were involved in a romantic escape from civilization, we are astounded to find him extend it to include *Neues Bauen*. He sees in two impulses the same cult of the authentic, the ethic of tactlessness and other forms of radicalism, which make him distrust the ideology of racial or national community spirit. In opposition to both of these attitudes in the Weimar Republic, he advances the discovery that the soul requires the 'cold air of diplomacy'. His critique of the new architecture is found in the chapter on the advantages of diplomatic behaviour. The reader, whom the author has in the meantime convinced of the devastating effect of intimacy, is caught off guard by this broadside directed toward the Bauhaus:

Industrialism is the mode of exchange, Expressionism the art, social radicalism is the ethic of

tactlessness. The cry for physical hygiene that is placated by a mere skylight (*Oberlicht*) and tiled walls corresponds excellently to an art which pounces without ceremony on what is essential, to a morale of merciless sincerity and hurting oneself and others on principle.¹⁵

Oddly enough, Plessner accuses Bauhaus architecture of violating the boundaries that he considers typical for all radicalisms. What is essential must be protected by drawing clear borders. Plessner will not tolerate the appearance of 'naked honesty' or 'eruptive genuineness' in a contemporary design, neither in Modern Movement interiors 'with skylights and tiled walls', nor in Expressionistic settings. He polemicizes against all forms of unmediated directness:

'Sincerity is not a guiding principle for two strangers ... After colliding briefly, cosmic coldness must lie between them.'

Yet why does Plessner direct criticism against an architectural movement that is considered the embodiment of the urban, and is famed for having completely done away with the culture of the overheated nineteenth century room?

Plessner argues in favour of nuances: controlled gestures, broken light. Evidently, the functionalism of the Modern Movement does not meet his demands; he dislikes the transfer of the dictates of sincerity to materials. As long as personal hygiene and the exposure of the construction merely serve to intensify 'genuineness', he expects little good to come from them. He expects the

architect to assume the virtues of a diplomat: precise knowledge of the borders, which may not be violated; spaces large enough to enable elegant avoidance manoeuvres; a play of masks as a convention of artificial means, with which human communication can function without too much frictional loss. A play of masks in the hope that the mask of politeness with the possibility of peacefulness will wear off on its aggressive wearers. What architecture was he thinking of here?

One wonders, of course, whether the anthropologist Plessner ever visited dwellings designed by Bruno Taut, Walter Gropius or Mendelsohn ...

We have to recognize that Plessner, like the Modern Movement, also stands in the force field between total mobilization and bunkering down. He cannot dissociate himself from this spatial reality. Plessner even goes so far as to say that a politically active existence is impossible without armour. A pure 'skin-ego', fears Plessner, will only be slaughtered off. As playfully modern as the type that he creates may seem, he finds himself in the chronic state of alarm typical for a person who knows he is surrounded by enemies. He exchanges briefly with the legal historian Carl Schmitt about this idea. Their systems of thought seem to touch one another, because for Schmitt the essence of the political rested on the ability to draw sharp lines between spheres of trust and mistrust, between friend and foe. Registered as 'half Jewish', Plessner slipped into the sphere of the enemy in 1933, while Schmitt moved up to higher levels in Nazi legal positions, Plessner was forced into exile in Holland via Turkey.

Plessner raises the problem of borders anew in the 1930s from the 'perspective of the migrant'.

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The problem of our walls

Brian Hatton

The people should fight for the law as for the city wall.

Heraclitus, cited in *Early Greek Philosophy*, Jonathan Barnes (ed.), Penguin, London, 1987

Unfortunately, our laws are not generally known; they are the secret of a small group of noblemen who govern us. We are convinced that these ancient laws are scrupulously adhered to, but all the same it is exceedingly distressing to be governed according to laws that one does not know . . . It is on this razor's edge that we live . . . The one indubitable law that is imposed upon us is the nobility, and could it really be our wish to deprive ourselves of this solitary law?

Franz Kafka, 'The Problem of Our Laws'

Are there enduring principles of architecture? 'Enduring' seems pleonastic. Whatever a principle may be, it endures. If it does not endure, it's not a principle. Rather like architecture itself, indeed. It is as if, not secure with material bonds in building and foundation, architects must bind their craft to 'higher things' to raise their walls to the plane of art. And once there, they dare not lapse lest ideals and towers alike cave in to entropy. Atop their walls, they too 'sit on a razor edge'. Schopenhauer¹ held of architecture that 'properly speaking, the conflict between rigidity and gravity' forms 'its sole aesthetic material'. That seems like a principle (or as if it could be formulated as a principle). But what guidance in practice does that offer to judging myriad ways of

modifying rigidity and resisting gravity? It would be convenient if there were architectural principles; we could dispense with history teaching in design schools. Disciplines that really have principles, such as mechanics, are not taught through their histories. Architecture, whereas, not only has a history, it has a history of principles. From Vitruvian Orders to Corbusier's 5 Points, 'principles' fill books and figure buildings, yet remain valid only for particular styles. Wherever they harden into code, statute, ordinance, or regulation, their mortar mortifies. To have history, rather than myth, or just a past, is to possess critical purchase on freedom and identity.² The value of 'principles' is dialectical; they are indispensable *yet/ because* they must always be attacked. Unlike those in science, architectural principles are metaphysical; sublime pieties couched as rational posits, wherefrom attempts to indicate specific designs of universal value could only be vain.³ Instead, whereas, architectural principles bear the anthropological features and functions of taboos, but taboos that involve their own transgression.⁴

'So, all things considered, I commend those who erect fortresses and those who do not . . .'

Machiavelli, *Il Principe* XX

Turn the question around. Instead of 'What principles produce architecture?' consider 'What principles are produced by architecture?' Architecture, it may be seen, is nothing other than the production of principles in space. Centuries have seen countless such principles manifested, then moulder as architectural

regimes rise and fall, or spread and dissolve. Then: What may be the most general condition for the production of particular principles? As architecture's material is space, its conditions appear to be those of definition/distinction, confinement/separation – the primal agency whereof is *the wall*. No principles without walls, no walls without principles. Note that 'without' means both 'deprived of' and 'outside of'. So there are Always Already Walls, whose continuous re/dis/sub (placement/version, etc) constitutes the perpetuation of architecture.

An exponent of this way of viewing architecture was Robin Evans. In 'The Rights Of Retreat And The Rites Of Exclusion. Notes Towards The Definition Of Wall', Evans assigns to the wall a decisively ambiguous role in mankind's reconstruction of its world, which it renders habitable 'by circumscribing and forgetting about those parts of it that offend. . . .' He describes the wall as instrumental in the 'environmental war against information'. Information was not an unqualified benison; it had to be dammed and divided by walls, and controlled by gates.⁵ But Evans emphasises that, once having divided his world, man simultaneously divides himself.⁶ Having fashioned a means of withdrawal, he finds it also becomes a device of exclusion. While 'the way of retreat asserts the right to retire from the arbitrary assaults of a cacophonous world' that 'has the advantage at least of creating a precinct within whose boundaries there exists a topology, a causal sequence, and a purposiveness of some salient significance. . . . By a curious mirror inversion of significance, the abodes of peaceful retreat have, in the past, been turned into the habitat of the outcast and reprehensible, the unmeaning, incomprehensible, or vile.'⁷

'Everything which comes into appearance must first divide', Goethe writes somewhere; but everywhere since that first wall, 'civilisation' has been the work of what Ernest Gellner called 'dividing practices',⁸ or as Claes Oldenburg put it, 'Distinctions, I suppose, are a civilised disease'.⁹

Man is that night, that empty Nothingness, which contains everything in its undivided simplicity: the wealth of an infinite number of representations, of images, not one of which precisely comes to mind or which are not there insofar as they are really present . . .¹⁰

G.W.F. Hegel, cited by Georges Bataille.

Taboo begets transgressions, division its discontents. Bataille conceived of transgression as a radical negativity. A child and an Easter egg: beyond a simple desire to consume the chocolate, the child also wishes to 'know' the egg, to 'have' it, not just as idea, but as continuous experience. Yet to gain this continuousness, which entails appreciation of both sides of the shell, the child must break the egg's own continuity. Not 'You can't have your egg and eat it' but 'You can't have the egg whole without the egg fractured'. This Sundering of primal continuity into 'advantaged alienation' displays something of the quality of Hegelian negation. Moreover, if the egg were reconstructable, so much the better, for deconstructing and reconstructing could then proceed indefinitely, like the child's game of *Fort-Da* described by Freud. (This thought may illuminate children's familiar propensity to smash their toys.) The game plays a dialectic: Thesis: Egg (whole, exterior); Antithesis: shattering (fragments, inte-

rior); Synthesis: Giedion and Zevi move toward this, but their modernist space-time (inside/outside *Aufhebung*)¹¹ misses the element of taboo/sacrifice that Bataille witnessed in negation. If architecture *in general* embodies a *general* principle, it is just that of an advantaging alienation. But this principle is not distinct from its agency; in and only in the agency is the principle manifest. As the egg was whole before the knife, so space was continuous before the wall – but only in its division is *consciousness* of continuity realised. Likewise law, which none may be above just as no-one may be athwart both sides of a wall. Tragedy of Humpty Dumpty, nursery Ikarus: broken on a wall because, atop its razor-edge his transgression was that of surveying the palindromic structure of the wall/law, God's sovereign view.¹² Gaining this vantage, Humpty violated not one taboo among others (salvable by minor sacrifice) but the general proscription which underwrites all others (all *Others*): Humpty fell for breaking all taboos by seeing that they are just that – violent rents, creating *ab initio* across nothingness – but only as images on screens, images which themselves become screens.¹³

Gone to the wall . . . up against the wall . . .
talking to the wall . . . banging your head
against the wall . . . off the wall . . .
up the wall . . .

Principles don't budge. Vertically, we imagine them as foundations or fulcra wherefrom to lever power; but horizontally they are walls. So Schopenhauer's dictum may turn through 90° to comprehend horizontal conflict. This axis seems the human one; in the expression of animus, resent-

ment, desperation and madness, the wall is an indispensable prop. A primitive tool for fixity, it arises in demarcation, the agent and index of law, privileging one as it suppresses an other. Actively, it is a knife in space,¹⁴ but once built fact it is passive, the site of projections aimed to negate its intolerable terminality. In Pliny's myth of the origin of drawing, the wall is 'already there' for Butades to trace the silhouette of her departing lover. But for Bataille, outline is itself analogy of a wall: perimeter demarking inside and outside, binding art to an oppressive architectural model that Manet's painterly modernism destroys. The site of this 'rebirth' of art (Bataille saw its birth at Lascaux) is a death: *The Execution Of Emperor Maximilian*. Nowhere are the judicial and terminal verdicts of the wall clearer than at a death by firing-squad. To be shot with no wall behind one is abject, for the wall delivers the last unction of the law, without or beyond which lies barbarism. In Manet's picture, that formal order is traduced: a distracted soldier turns aside, axes skew, space flattens, riraff gawp in over the wall. The site of architecture's equivalent too, would be an execution: that of Luxemburg & Liebknecht, commemorated by Mies Van Der Rohe's 'free wall'.¹⁵ The wall's principle is the conflict of principles, dealt in Alexander's way with the Gordian Knot: a transgressive cut. Projections upon it subvert its discipline, sublimate its presence. They begin 'unreal', like the phantasmic shadows on Plato's cave-wall; but as rock yields to water, the wall liquefies to a lustrous beyond, to plunge into, like Cocteau's Orfée through Mercury's mirror, to Hades. The Berlin wall: one side blood, the other, graffiti. But here the surface-tension was

too charged not to be shattered by hammer-blows. 'Suddenly I have no historical imagination to cope with this wall, with this city cut in two like a brain with an artificial scalpel.'¹⁶ 'The wall was the transgression to end all transgressions. It was as if I had come eye to eye with architecture's true nature. Were not division, enclosure, exclusion essential stratagems of *any* architecture? The wall suggested that architecture's beauty was directly proportional to its horror.'¹⁷

Divine continuity is linked with the transgression of the law on which the order of discontinuous beings is built. As discontinuous beings, men try to maintain their separate existences, but death, or contemplation of death, brings them back to continuity.¹⁸

The first walls, cave walls, were not fully walls; they did not yet manifest the principle of discontinuous distinction. Lacking yonder-sides, they faced and enclosed, but did not divide space. Likewise they were not distinct from floor and ceiling, but part of a continuous, folding envelopment; Bataille compared the Lascaux cave to the interior of a nut-shell. Within its bound were projected realms of an infinite space, though, like Hamlet's shell, not without 'certain bad dreams'. They were the realms of the herds across the yet-unfenced face of the earth, hunted but unhemmed by nomads who, no more than their quarry, knew of measure in time or division in space. The overlaid images, bravura strokes, and absence of frames of the cave artists impressed Bataille as the joy of a spontaneous humanity: the birth of art was the birth of man, because the paintings testified to feelings of sacred awe for the beasts, feelings inseparable from taboo and trans-

gression in the deed of the kill, and thus inceptive to the practice of sacrifice.¹⁹

Bataille's Lascaux book nowhere states explicitly what elsewhere he makes sharply clear: that the primal grace that exults him among the hunters is a pre-architectural, indeed anti-architectural state. Wherever Bataille moves to contrast freedom with repression, he draws a metaphor from architecture, but it was in his Documents dictionary that he identified architecture as the agency of oppressive, rigidifying rationalism.²⁰ Dennis Hollier's reflections on these texts, *Against Architecture*, are acute, but overlook an elision in Bataille's thought, which is that the vital continuum that exults Bataille in the hunters' world already contained and was defined by the frame of architecture. Like death in Arcadia, architecture was there, too. The key passage in 'Lascaux' (recapitulated in 'Eroticism') is devoted to fathoming the 'figure in the well', where a shaman appears to expire in the same scene as the death of a disembowelled bull. This scene, for Bataille, is the crucial illustration of sacred transgression. It may depict the crisis of a one-to-one struggle linking man and beast; it is certainly a mystery that casts a thaumaturgic flicker across all the chases of the grotto. Yet it is not the typical scene. Some cryptic friezes draw a different case: that architecture began as a trap for animals.²¹

Throughout the panic of its wild gallop, Lascaux draws no barrier save for certain gridded squares onto which some hooves have meshed. They are singular exceptions to the boundless flux around, in which they float like glyphic nets in a prairie sea. We have no sure proof that they are traps; yet they are strangely apodictic: they are harbingers of the

end of hunting, the end of nomadism, the planting of enclosure, and the onset of division. Agriculture, with its entailments for defence of territory and deferral of consumption will bring in train the division of land and labour, calendars, coin, geometry, and writing: the whole *cardo et decumanus* of civilised space and organised time. Plot in space would project plan in time.

Whatever the adventures of its principles and variations of its styles, architecture would be the ubiquitous and perduring agent of this new order. Indeed, it would become so as to seem synonymous with order itself, its very stamp, its word, its positivity.²² Its operative edge would be the wall, defining in and out, here and there, presence and absence. This is the wall that Bataille names to expose, to abominate, if not yet to 'deconstruct'. In the release of abjection and the 'formless' of modern painting, he sought a kind of antidote to architecture. But like the *pharmakon*, it may not be so resolvable as simple opposition. Does wall simply cleave *either* from *or*? Could it not itself partake in a reflexive expenditure, turning on itself in a gesture simultaneously self-cancelling and self-spacing? 'Organic' fantasies of the continuous, such as Kiesler's 'Endless House', dissolve the wall into a topological reversion to a cave: a utopia beyond division.²³ This undialectical solution ignores the reciprocity and complicity of the blade and screen, in their alternating play as taboo and transgression. An autotransgressive architecture might follow not a general, but a critical inversion of the specific structure of the Lascaux grotto. In this transit from pre- to post-architecture, the wall would no longer wrap around us; we would move around it; where

the cave wall had no other side, this would be all other side. Where, at Lascaux, a continuous convolution contained in its midst a fatal grid, here a sheer slab would frame within a rectangle, like a sliver on a microscope-slide, a plane of primordial creation. Where Lascaux was a burrow envired in dark, this would be a terrace englazed in daylight. Where would we find ourselves, reversed, beyond the tain of that mirror? By the onyx screen in the *salon* of the Villa Tugendhat.

But the fantasy makes it ours, a kind of
fence-sitting

Raised to the level of an aesthetic ideal . . .

But like the friendly beginning of a geometrical
progression

Not too reassuring, as though meaning could
be cast aside

Some day when it had been outgrown

John Ashbery 'Soonest Mended'.

The onyx slabs in the Tugendhat Villa and Barcelona Pavilion are the purest expression of the open plan, more radical than Le Corbusier. At Villa Savoye 'Apollonic' piloti bear loads, releasing the walls to lead what Tony Vidler called a 'Dionysian dance' of the free plan. Yet this dance still encloses discrete rooms; the walls remain engaged. But in his 20s open plans Mies emancipated the wall from all engagement to become a sheer object for disinterested contemplation: a Kantian wall of 'purposeless purposiveness', of a modality corresponding to both the aesthetic of the beautiful (in that it is, in itself, a distinct form) and sublime (in that it demarks no bound, whilst its marble cloudings fascinate yet defeat all fathoming).²⁴ Such a

Kantian wall was identified by Robert Smithson in 'an unfinished dam seen as a functionless wall. When it functions as a dam it will cease being a work of art and become a utility.'²⁵

In *The Wall And The Books*, J.L. Borges discerned in the free wall a singular transgression, observing that Huang Ti, who ordered the building of the Great Wall, also decreed that all books prior to him be burned. Perhaps, 'The Wall in space and the Fire in time were magic barriers designed to halt death . . . Perhaps the emperor tried to recreate the beginning of time and called himself Huang Ti so as to be in some way Huang Ti the legendary emperor who invented writing and the compass.' Borges then addresses a further stake: 'Perhaps the burning of the libraries and the erection of the wall are operations which in some secret way cancel each other . . . it is plausible that this idea moves us in itself, aside from the conjectures it allows. (Its virtue may lie in the opposition of constructing and destroying on an enormous scale.) Generalising, we could infer . . . that *all* forms have their virtue in themselves, not in any conjectural "content" . . . Music, states of happiness, mythology, faces belaboured by time, certain twilights, certain places try to tell us something, or have said some thing we should have missed, or are about to say something: this imminence of a revelation which does not occur, is perhaps the aesthetic phenomenon'.

Eros brings into the open what the law must hide yet nevertheless contains within itself: that the temple is a nuptial chamber . . . If hierogamy is the secret of sacrifice, sacrifice will nevertheless serve to hide the fact. It will pile

a wall of blood and corpses before the place where Komaitho & Melanippus abandoned themselves to their improbable, 'successful love'. The external façade of the temple imposes 'the law of men'. The nuptial interior subverts it. But if the interior become the exterior, the world is threatened by the adolescent diable au corps that then invades it. So the world strikes back and strikes to kill. Sacrifice and hierogamy are two forces that presuppose each other, are superimposed over each other, and are interlocked. They oppose each other, but they also support each other. They are each other's aura.²⁶

In cubism, as everyone sees, there are no cubes. Indeed, there are no confined forms at all, for what is most broken by Braque and Picasso are the outlines that demarcate distinct things. The integrity of objects, their intervals in depth, are disrupted; yet those are not cubism's essential aims. Nor is the result a painterly miasma; for it is distinction itself, but without limits, that is cubism's objective. It is to enhance and intensify the play of distinctions, and not more fully to apprehend objects, that cubism deploys the vaunted 'moving vantage'. The elemental module by which cubist space is organised is neither an object nor painterly *tache* but a raking plane that, sheer at one edge, vague at its other, makes a single vector, ambiguous yet decisive. Wherever it cleaves, the vector's direction is indeterminable: both salient and receding simultaneously, yet ascertainably neither; it is the very slash / that splits yet joins *either* and *or*. It *cleaves*. We might call it by a term which Schoenberg adopted from Greek theatre for

an atonal work of 1913, meaning 'sudden reversals': *peripataeia*. In this device, the ultimate of cubism is found not in Mondrian's 'neoplastic' resolutions but in the *Painterly Architectonics* of Liubov Popova. Their *peripataeia* cleave against, and out of each other in spatio-chromatic chiasms compounding clash and complement in reciprocal suppression and resurgence. Her 1919 manifesto declares 'Construction in painting = Sum of the energy of its parts . . . Energetics = direction of volumes + planes and lines or their vestiges + all colours.'²⁷

Architecture, able to assume cubism's dynamic ambiguity only when itself in pictorial form, as in Piranesi's *Carceri*, or Liebeskind's *Micromegas*, had to proceed to self-negation in its own means. Where cubism traced the play of vantages, architecture would engage movement, through the succession of bifurcations. It was at the edge of a wall, where a wall as it were becomes, yet is still not, a door that this unique phenomenon occurred. It was condensed in the door constructed in his flat at 14, Rue Larrey, by Marcel Duchamp. Rather as Duchamp declared his Large Glass to be 'definitively unfinished', this was simultaneously open and shut, disclosing one room as it closed another, like pages in a book.²⁸

This perverse door was a one-off; the utopian impetus of modernism rejected any closure to choice of movement through the bifurcations. If Utopia was to be a zone beyond sacrifice or transgression it would take form amid the space of Arcadia. Forsaking forms and places altogether, lay the mediatic utopia of Superstudio: '*no further need for cities or castles, roads or squares . . . every*

point will be the same as any other'. Their montaged grids were ironic spatial anticipations of the World Wide Web, but indicated their pastoral idea of the net as a new prairie: What began as a trap for the wild would become its medium.²⁹ Such seems the fantasy of the open plan, where aesthetic 'fence-sitting' occurs, not on Humpty's precarious razor-crest, but in moving horizontally among edges vertically raised for contemplation, as were the onyx blades in Mies' 'int/exterior.' Total availability of the horizontal was the aim in Constant's *New Babylon*: it projected limitless galleries of reified derives through a vacated, detourned *Burolandschaft*. Resembling an infinite airport mall; 'dutyfree' in every way, it suggests a nemesis not in downfall but some spatial psychosis: horizontal vertigo.³⁰ Effective situationism was site-specific: Matta-Clark's and Wodiczko's guerilla actions with chainsaw and projector exposed more acutely the conditions of difference that articulated free space across architecture, art, institution, and property; their cuts across buildings were in effect sections through legitimacy. *New Babylon's* fusion of mall, museum, and Situation was ironised in Art & Language's 'Incidents In A Museum' series. In these paintings of open plan galleries, space-dividers and pictures hung on them interframe each other in, as it were, 'Mies-en-abymes' – labyrinthine imbrications of neo-avantgarde with institution.³²

Inside this labyrinth . . . one finds two special rooms. One is large and well lit. It is the room of the Dionysiac fresco, which serves as an antechamber. The second room (cubiculum) is small and dark, with a cave-like recess for the conjugal bed . . . In the frescoes of the

anteroom and cubiculum, the wall and its illusory perspective into a mysteriously hidden 'beyond' has been replaced by a dimension of colour—crimson. Colour has annihilated perspective space. The lifesize figures come and go against this rhetoric of absolute redness, the mirror of Liber Pater, blood, spilt liquids, wine, and sacrifice.

John Outram, *Villa of Mysteries*³³

If Barcelona was the utopian pavilion, the dialectics of habitation were negotiated in the Villa Tugendhat, which could not dispense with separation. Indeed, ironically, Tugendhat's open plan salon conceals a cave. Bermed into a hill, its core is a photographic darkroom to which the glazed salon relates in plan as lens to a *camera obscura*, and the onyx blade its shutter.³⁴

Or guillotine; to cut from continuity to freeze, catch in a trap for light, released in the darkroom on discrete frames to return to day; but still as still as the hooves caught in the net on the frieze at Lascaux. It was the camera's trap that caught the original, enduring violence of architecture, in Eli Lotar's photographs of the slaughteryards of La Villette. Published by Bataille in *Documents*, they show the utter antipodes of the 'reindeer age'. The grids and blades of the architectural have so closed together that only hunks of flesh are left. In one picture, a row of hooves is propped against a wall whose edge falls across the yard like a fatal *culisse*. Another shows a severed flank pushed out on the yard floor, its bloody trail bending as if the abattoir door had been the axe that swung through it. Indeed, inasmuch as Lotar's photographs and Bataille's text emphasise the schism between the

abattoir's external orderliness and the chaos within, it is as if the walls themselves are its true knives. As Bataille commences the museum in time with the guillotine, he locates modern alienation from death and sacrifice at the spatial bar of the abattoir wall.

But Lotar was anticipated by Adolf Loos. In 1903 Loos published a photograph of a Vienna shop, praising its refined modesty. As it was to be demolished, Loos proposed it be put into a museum – for walls. The photograph is mute, cryptic, like an Atget 'scene of a crime'. But here the 'victim' is seen. The shop sells game; it has no ornament, but it is trophied with the body of a deer, on which Loos is silent. It appears in his journal *Das Andere* – 'The Other'.

But the drift of this essay has been to generalise Bataille's idea to every kind of withdrawal/exclusion, where the means of distinction, whether wall or principle, is held either 'absolute' or 'natural'. These two warrants of ideality might be termed 'utopian' and 'arcadian', which it was modernism's originality to compound, as if henceforth there would be, could be, or need be no 'other'. In architecture, the providential symbol of this 'transcendence' of withdrawal/exclusion was the open plan and free wall; in its ultimate version, no wall but boundless transparency. Even in Bataille, ironist of idealistic suppressions and sublimations, this persists in his blindness at Lascaux to implications in the graphic structures. Instead, I have tried to show how architecture itself may be a sacrifice, first in its transgression of nature, then, in modernism, of itself. Modern oblivion of architecture's sacrificial historicity follows either a utopian mode of foundation on principles or an arcadian

dream of their dissolution. Neither supersedes the other, nor admits of our forgetting or abandonment. Like the bull's hoof, the goat's foot, they are *cloven*.

In the 'Vespers' of his *Horae Canonicae*, W.H. Auden describes an encounter of two figures he calls utopian and arcadian, whose passing he draws into a parable of self-knowledge and social cognisance. Their distrusting glances betray mutual reflections, revealing reciprocal identities, co-dependent as they are on each other's differences. Each is the other's lack, projects the fantasy of the other.

Was it (as it must look to any god of cross-roads) simply a fortuitous intersection of life-paths, loyal to different fibs,

or also a rendezvous between accomplices who, in spite of themselves, cannot resist meeting

to remind the other (do both, at bottom, desire truth?) of that half of their secret which he would most like to forget,

forcing us both, for a fraction of a second, to remember our victim (but for him I could forget the blood, but for me he could forget the innocence)

on whose immolation (call him Abel, Remus, whom you will, it is one Sin Offering) arcadias, utopias, our dear old bag of a democracy, are alike founded:

for without a cement of blood (it must be human, it must be innocent) no secular wall may safely stand.

Notes and references

1. Arthur Schopenhauer, *The World As Will And Idea*, Vol. 1, p. 277 (RKP, 1883).
2. 'Historical criticism. . . . is part of that complex working towards freedom which may be described as the revolt against authority. It is merely one facet of that speculative spirit of an innovation, which in the sphere of action produces democracy and revolution, and in that of thought is the parent of philosophy and physical science.' Oscar Wilde, *The Rise Of Historical Criticism*, 'Complete Works Of Oscar Wilde', p. 1105 (Collins, 1986).
3. Since the scientific revolution, principles (as in Newton's *Principia*) appear as intermediate between general truth and specific procedure, as in experimental method, or in technical implementation, e.g. the design of a motor according to thermodynamic, electromagnetic, or other physical principles. Wittkower's title 'Architectural Principles In The Age Of Humanism' might be said anachronistically to project an enlightenment concept back onto an era whose model was more like Aquinas' 'first thing': 'To proceed from a principle so as to be something outside and distinct from that principle is irreconcilable with the notion of a first principle, but an intimate and uniform procession by way of an intelligible act is included in the notion of a first principle were the builder the first principle. God, who is the first principle of all things, may be compared to things created as the artificer to artificial things.' (*Summa Theologica* Qu. 27, Article 1.) Theologians and scientists developed distinct notions of 'principle', but architects barely deployed the term before the era of

positivism. *Bon Gout and caractère* were the concerns of Boffrand's 1745 *Livre d'Architecture Contenant Les Principes Generaux De Cet Art*. Pugin's *True Principles Of Pointed, Or Christian Architecture*, and Carl Bötticher's *Das Prinzip der Hellenischen und Germanischen Bauweise*, begin more rigorous, nearly proto-phenomenological, analyses of aesthetic relations between structures and surfaces. Bötticher's 'principle of tectonics', distinguishing *Kernform* and *Kunstform*, is followed by Semper's 'principle of dressing', differentiating *Wand* from *Mauer*, and Loos' *Prinzip der Bekleidung*, privileging the spatial effect of the surface material, which in turn seems to have inspired Le Corbusier's 'Law Of Ripolin' in *L'Art Decoratif D'Aujourd'hui*.

It might be claimed that this period of early modernism is the only one which displays a coherent project to adapt the concept of 'principles' to architectural aesthetics. For two contrasting interpretations of it, see Kenneth Frampton's *Studies In Tectonic Culture* and Mark Wigley's *White Walls, Designer Dresses*.

4. Why bother with principles? Because they are concomitants of disciplines designed (but designed according to what further principles?) to guarantee truth and architectural nobility. But this presumption, like that given to the nobility by Kafka's puzzled yet finally pacified Chinaman, is suspended in the modern outlook, for which criticism, experiment, and the sublimity of freedom are paramount. As Bataille observes in *Eroticism*, 'philosophy finds itself in an impasse; without discipline, it could accomplish nothing, and yet in that it cannot embrace the extremes of its subject, the extremes of the possible . . . the outermost reaches of human life, it is doomed to failure.' (Boyars, 1990, p. 259).
5. Robin Evans, *Architectural Design*, 6/71. Evans' idea of a 'war against information' seems not quite the

right way of putting it. Information theory has it that too many signals reduce information, registering merely as 'noise'. The 'war' which the wall prosecutes is as much for information and against entropy. But what criterion decides a signal's value? Robert Smithson drew walls in dialectical relation to entropy in various writings and works. Rigorous analysis of the function of walls and gates in dynamic information systems is beyond the scope of this essay, but Manuel de Landa offers an indicator: 'In mathematical terminology, the events at the onset of self-organisation are called "bifurcations" – mutations that occur at critical points in the "balance of power" between physical forces (temperature, pressure, speed, etc) – when new configurations become energetically possible, and matter spontaneously adopts them. It is as though "inert" matter, confronted with a problem stated in terms of a balance of forces, spontaneously generates a machinelike solution by drawing from a "reservoir" of abstract mathematical mechanisms.' ('Nonorganic Life' in *Zone 6*, 'Incorporations'. eds. Jonathan Crary and Sanford Kwinter, NY, Urzone, 1996, cited in SML, XL by Rem Koolhaas.)

Bifurcations characterise a labyrinth in which junctions not only divide but also connect and reconnect, often to topologically remote lines and loci – an example might be the 'semilattice' proposed by Christopher Alexander as a model of a city in his well-known essay 'A City Is Not A Tree'.

6. But these 'rites/rights' are always already within. The subject is objectified by a process of division either within himself or from others. This would seem to be the claim of Lacan's account of the 'mirror-phase'. Alienated distinction of self as other was rendered as bitter irony by Joseph Brodsky: 'Now that I've walled myself off from the world/I'd like to wall myself off from myself./Not fences but mirrorglass it seems to me will best accomplish this . . . '

7. The inter-implicity of retreat and exclusion that Evans identifies is tragically illustrated in the relations of Jews and Christians. The *ghetto*, or zone of exclusion imposed on Jews by gentile communities, is paralleled by the *Eruv*, or zone of confinement self-imposed by orthodox communities in order to keep their law of the Sabbath. See Eyal Weizman and Manuel Herz: 'Between City And Desert: Constructing The North London Eruv' *AA Files* 34.
8. Ernest Gellner, *Plough, Sword, And Book. The Structure Of Human History* (Collins Harvill, 1988). Gellner proposes his theme as the development and legitimisation of division through and in production, coercion, and cognition: 'The capacity to assign a place without being challenged is the paradigm of legitimacy. Coercers and legitimators are complementary. Legitimators are underwritten by a given power situation; but equally, the balance of power depends on the nature, size, and position of groupings, which in turn are built up by the humble activities of the ushers and usherettes of each society, who lead men to their places. . . ' (p. 18). Doubtless, walls are foremost among 'coercers', but where architects move among legitimators is unsure.
9. 'Philosophy is ever the art of drawing distinctions, look at the matter how you will. The peasant uses all the propositions of the most abstract philosophy, but wrapped up, embedded, tangled, *latent*, as the physicists and chemists say, the philosopher gives us the propositions in their pure state.' G.C. Lichtenberg, cited by Isaiah Berlin, *The Age Of Enlightenment* (Oxford University Press, 1979).
10. G.W.F. Hegel, *Jenenser Philosophie des Geistes in Sämtliche Werke*, Leipzig, 1931, vol. 20, pp. 180–81. It is cited by Bataille in his essay 'Hegel, Death and Sacrifice', republished in *Yale French Studies* 78: *On Bataille*.
11. Siegfried Giedion's *Space, Time, & Architecture* pursues a Hegelian route to the 'space-time' synthesis of the modern movement. A schematic summary of modernist 'principles' ('seven invariables') is presented by Bruno Zevi in *The Modern Language Of Architecture*. In his chapter 'Syntax of Four-dimensional Decomposition' Zevi writes of the Dessau Bauhaus building 'Programmatically dissonant blocks are linked together in defiance of perspective. There is no vantage point from which you can grasp the whole. Hence movement, hence time.' Zevi's key value is *dissonance*, which for him in turn signifies 'emancipation', which he seems to view as a teleological terminus beyond any further dialectic or difference. That the 'invariables' by which he codifies this emancipation may themselves be deconstructable is not to him admissible. Zevi illustrates his summary with a passage from Frank Lloyd Wright on the decomposition of the walled room. Wright opens: 'Now I shall try to show you why organic architecture is the architecture of democratic freedom. This freedom appears in the decomposition of the box by way of the cantilever and continuity . . . In this simple change of thought lies the essential . . . architectural change from box to free plan and the new reality that is *space* instead of matter . . . These unattached side walls become something independent, no longer enclosing walls. They're separate supporting screens any one of which may be shortened or extended or perforated, or occasionally eliminated. You can perfect a figure of freedom with these four screens; in any case, enclosure as a box is gone . . . Space may now go out or come in where life is being lived, space as a component of it.' (Frank Lloyd Wright, *An American Architect*, ed. Edgar Kaufmann (NY, 1955), cited in Bruno Zevi (U. of Washington, 1978).
12. The thought that the bilateral, simultaneous surveillance granted to a wall-astride gaze might re-initiate

the hubristic project of King Nimrod is the crucial intuition in Kafka's 'The Great Wall of China'. Ruminating on the fragmented, unfinishable project, Kafka's builder cites the speculation of a scholar: 'He maintained that the Great Wall alone would provide for the first time in the history of mankind a secure foundation for a new Tower of Babel. First the Wall, therefore, and then the Tower.' The biblical story has God blast the tower and cast its builders into divided language because it presumed to reach the infinite vantage of heaven, which can see across all walls. (cf. Ashbery, Borges.)

13. Perhaps Hegel's 'master-slave dialectic' might be retold as unfolding between the builder of the wall and the projector of pictures on the wall. The inherent conflict between wall and projection was noted by Le Corbusier in a letter to Viktor Nekrasov in 1932: 'You have in Moscow, in the churches of the Kremlin, many magnificent Byzantine frescoes. In certain cases, these paintings do not undermine the architecture. But I am not sure they add to it either; this is the whole problem of the fresco. I accept the fresco not as something giving emphasis to the wall, but on the contrary as a means to destroy the wall violently, to remove any notion of its stability, weight, etc. I accept Michelangelo's *Last Judgement* in the Sistine Chapel, which destroys the wall; and I accept the Sistine ceiling as well, which completely distorts the very notion of ceiling. The dilemma is simple; if the Sistine Chapel's wall and ceiling were intended to be preserved as form, they should not have been painted with frescoes; it means that someone wanted to remove forever their original architectural character, and create something else, which is acceptable.' (On the Sistine ceiling, see below, note 14.) Note that Le Corbusier assigns the priorative value 'original' to architecture. In 1910, he had described this value: 'A wall is beautiful, not only because of

its plastic form, but because of the impressions it may evoke. It speaks of comfort, it speaks of refinement, it speaks of power and of brutality; it is forbidding or it is hospitable; – it is mysterious. A wall calls forth emotions.' (cited by Tony Vidler in 'The Architectural Uncanny' p. 90, referenced p. 237). The 1932 letter was cited by Richard Serra in his Yale University lecture of January 1990 in the course of claiming the proper scope of site-specific art that should, in Charles Harrison's comment, 'maintain a critical presence or difference in relation to its context and not be co-opted either as decoration or as reinforcement of any institutional purpose'. Serra precedes his citation from Corbusier by stating 'It is the explicit intention of site-specific works to alter their context. Le Corbusier understood this as early as 1932.' He follows it by adding 'This concept should be understood and protected.' A 'protected' concept might be a definition of a principle. But 'protected' by what? By walls?

14. The violence of the wall appears in the architectural section. Itself a cut across and through a building, it reveals, at right angles, the walls which divide room from room, with their simultaneous differences. To see a wall 'end-on' is to straddle a threshold, and thus be given two realities. In Renaissance painting, the section was often the space of annunciation, but when Michelangelo cut the space of two diagonally opposed corner frames on the Sistine ceiling, he used the section wall's violence to reinforce that of the scenes depicted – *The Hanging of Hagah* and *Judith and Holofernes*.
15. Some mystery surrounds this monument, which was destroyed by the Nazis, for it seems not clear why the Communist Party chose Mies, who maintained 'unpolitical' views, for designer. The story goes that when the communists asked Mies how he would envision a monument to their martyred leaders, he

replied 'They were shot against a wall, weren't they? Then that is what the monument should be: a wall.'

However, Rayner Banham points out in 'Theory & Design In The First Machine Age' Mies' debt to the Dutch architect Berlage's emphasis on the tectonics of the wall: Banham cites Berlage's 1908 *Grundlagen und Entwicklung der Architektur*:

The art of the master builder lies in this: the creation of space, not the sketching of façades. A spatial envelope is established by means of walls, whereby a space or a series of spaces is manifested, according to the complexity of the walling.

But Banham points out that Berlage's wall was still load-bearing and that what 'Berlage appears to have in mind is interior space within the building envelope, not space as an extensive continuum ... but walling had for Berlage a more than customary value. In his German texts he persistently speaks of *Mauern* and *Mauerflächen*, emphasising the wall's substantial qualities, and he insists, at the end of his *Gedanken über Stil*:

Before all else the wall must be shown naked in all its sleek beauty, and anything fixed onto it must be shunned as an embarrassment.

and in the *Grundlagen*:

And thus walling would receive its due value again, in the sense that its nature as a plane would remain, while a more heavily articulated surface would not register as wall'.

Banham sees Berlage's idea of the wall radicalised by De Stijl and realised by Mies. Banham also links Mies to Loos' identification of architecture's 'true essentials' in 'space-creation and relationships of masses'. A more immediate link, however, was their common passion for crazed and chromatic marble – Loos' cippolino at Villa Moller and Mies' onyx at Tugendhat.

16. Jean Baudrillard, *Cool Memories* (Verso, 1990), cited under 'Wall' in SML,XL Rem Koolhaas.

17. Rem Koolhaas, 'Field Trip', in SML,XL. K. explicitly refers to Bataille in this essay on the Berlin Wall.

18. G. Bataille. 'Murder & Sacrifice' in *Eroticism*, p. 83. (Marion Boyars, 1987)

19. 'The ... passage from prohibition to transgression, is understood at the moment that transgression, given free flow in a movement of festivity, is finally granted in activity the eminent place that religion has conferred upon it. Such a principle could not be opposed to precise determinations which each work would allow for its own. A work of art and a sacrifice participate in a notion of festivity going beyond the world of work and the prohibitions necessary for the protection of this world. Every sacrifice corresponds somewhat to the search for a sacred instant going beyond profane time, where prohibitions guarantee the possibility of life'. (G. Bataille, 'Lascaux, Or The Birth Of Art'. Skira 1955, p. 38.)

20. In his book on Manet, Bataille damns academic painting in architectural metaphors already coined in his *Documents* article on 'Architecture': 'Moreover, each time that *architectural composition* turns up somewhere other than in monuments, whether in physiognomy, costume, music, or painting, one may infer a prevailing taste for divine or human *authority*. The great compositions of certain painters express the desire to force the spirit into an official ideal. The disappearance of academic construction in painting is, on the contrary, the opening of the gates to expression (hence even exaltation) of psychological processes that are the most incompatible with social stability. This, to a large extent, explains the strong reactions provoked for more than half a century by the progressive transformations of painting that, up until then, was characterized by a sort of hidden architecture.' *Documents* No.2, May 1929.

21. 'His gaze, going past those bars, has got so misted with tiredness, it can take in nothing more. He feels as though a thousand bars existed, and no more world beyond them than before.'
'The Panther Jardin des Plantes' R.M. Rilke, trans. J.B. Leishman. This is a cage that one neither enters nor leaves, as both sides of the bar become labyrinthine at the threshold of the trap. As Denis Hollier put it, 'Bataille–Theseus' triumph in the sacrificial battle with animal victim (Mino/taumachy) comes only after he has identified with it.' (p. 62)
22. The work of Langlands & Bell presents *imprese* of architectural order as mute tableaux of typologies and plans. Their mode is lapidary, definitive relief; the style of seals, coins, logos, and sepulchral cartouche: empty tabulae whereon death and order subtend: 'Sacred to the memory of utopia' or 'The Law is dead. Long live the Law'... Here is the Law's fossil and its formula; the formula: Always To Return.
23. '... the flow of life activities cannot be squeezed into an array of room-boxes. The house, that is, the walls, floors, and ceilings, must not meet one another at sharp angles ... artificially, but should flow into one another uninterrupted by columns or beams. The Endless House solves this problem through a continuity of lighter and heavier shells ...' Frederick Kiesler, 'Inside The Endless House' NY 1966, in 'Selected Writings', Verlag Hatje 1996
24. '... the beautiful in nature relates to the form of an object which consists in limitation; the sublime, on the contrary, is also found in a formless object insofar as *limitlessness* ... is presented, to which nevertheless the thought of totality is added. Thus, the beautiful can, as it were, be taken as the representation of an indeterminate concept of the Understanding, the sublime as the representation of an indeterminate idea of Reason'. *Critique of Judgement*, Akademie edition, translated and edited by S. Körner in *Kant* (Penguin, 1967), p. 190.
25. 'Towards The Development Of An Air Terminal Site' in *The Writings Of Robert Smithson*, ed. Nancy Holt. (NYU Press, 1979).
26. Calasso refers to a story in Pausanias of a young couple who, their union barred by their families, took to slaking their illicit passion secretly in the temple of Artemis, with awful consequence, following the order of the Delphic oracle for their sacrifice and that of further yearly young couples. But Calasso cites Pausanias: '*The unhappy adventures of Melanippus, like those of many others, show how love tends to undermine the law of men and subvert their devotion to the gods... But I do believe that for Melanippus and Komaito it was not a misfortune: only one thing is worth as much as life itself to men: that a love should be successful.*' (Robert Colosso, *The Marriage of Cadmus and Harmony*)
27. Liubov Popova, for the '10th State Exhibition', January 1919, Moscow. Popova's paintings abandon objects but retain spatial-chromatic dialectics. Whereas Kasimir Malevich's statement *Suprematism* in the same exhibition, asserted even such abstract articulations to be insufficiently absolute: 'And even if the artist's depiction is constructed abstractly, but based on colour interrelations, his Will will be locked up amid the walls of aesthetic planes, instead of being able to penetrate philosophically. I am free only when – by means of critical and philosophical substantiation – my Will can extract a substantiation of new phenomena from what already exists. I have breached the blue lampshade of colour limitations and have passed into the white beyond; follow me, comrade aviators, sail on into the depths: I have established the semaphores of suprematism.' (In John Bowlt *Russian Art Of The Avant-garde: Theory & Criticism 1902–1934*. Viking, NY, 1976.)

28. The Rue Larrey door denied the French proverb 'A door is always either open or shut' with an 'undecidable': a zombie-like, dead-yet-alive entity that disturbs binary oppositions that construct truth-claims.
29. But with Superstudio, opposites perversely mesh, so that they could also declare their grid as a mega-monument, walling the earth: 'We are working on an architecture which we hope to render sacred and immutable . . . a sign in the desert, architecture pitted against death, as serene happiness, architecture as sweet tyranny'. (1968. In C. Jencks, *Modern Movements in Architecture*, 1973)
30. Guy Debord made 'separation' into a category in Situationist theory. A spatialised version of alienation, it posited a subject split into consumer and projected 'spectacle', confounding prison wall and ideological screen in a single plane. In 'New Babylon', walls were free improvisations within an ambience of open-plan play. Yet, as Mark Wigley notes, Constant's later paintings depict a 'stained architecture' where play has become inseparable from violent conflict, whose freeplan screens are splattered with blood. ('The Hyperarchitecture Of Desire', Rotterdam 1998)
31. Site-specific installation inserts a subversive 'other' into the built order of compartment: 'Presenting itself publicly as a timeless functional monolith, well-camouflaged by the pale and bloodless surface, the Wall operates behind its putrifying appearance as a full-blooded, fleshly ideological medium. To protect its undercover activity, a conspiring wall must be a Wall-to-Itself. The cultural aim of critical public art is to publicly Unwall the Wall'. (K. Wodiczko, 'Public Address', Walker Art Centre Minneapolis 1991). Gordon Matta-Clark, who trained as an architect, performed deconstructive sections on buildings: 'My initial decisions were based on the avoidance of making sculptural objects an abhorrence of flat art. Why hang things on a wall when the wall itself is so much more challenging a medium? It is the rigid mentality that architects install the walls and artists decorate them that offends my sense of either profession. A simple cut or series of cuts acts as a powerful drawing device able to redefine spatial situations and structural components. What is invisibly at play behind a wall or floor, once exposed, becomes an active participant in a spatial drawing of the building's inner life. '(Interview in exhibition catalogue 'Matta-Clark', International Cultureel Centrum, Antwerp, 1977)
32. Charles Harrison's 'Essays On Art & Language' (Blackwell, 1991) relates the 'ontological instability' of this series both to the uncertain position of the spectator 'in the painting' and in the open-plan labyrinth 'reading the museum', 'a place', as the text in a related painting, *Hostage XXIV*, declaims, 'where Humpty Dumpty has the power of small adjustments in his metier, a place of contrivance and factitiousness.'
- Like Ashbery's precarious, vacating contemplation, Art and Language's Humpty 'raises fence-sitting to the level of an aesthetic ideal', perched on the ridge between meanings, on the edge of the space divider in the museum's open-plan. Until a push into representation precipitates a provisional resolution, though one composed in querulous, discursive fragments. This 'push off the fence' is, surely, the 'incident in a museum' that is named: As painting, after Bataille's Manet, dissolved the frame of architecture, so the colourfield/open-plan of modernism/museumism is at least ironically referred to critical convention by Art & Language's 'writing on the wall' – or, given the *Incidents'* format of scaled insets, like a computer interface-*Windows*© on the wall.
33. John Outram, 'Villa Of Mysterie', FMR No. 24, Feb. 1987.
34. As to what the lens of an ideal open-plan salon looked out on, Mies gave a glimpse in a 1938

montage of the Resor house, Wyoming. A panorama through its glass wall shows the Rocky Mountains clear but for four vertical cuts – outlines of slender columns. The view replicates precisely those paintings by Kaspar Friedrich, where we look over the shoulder of a fell-top wanderer at the brink of a boundless space. But the cuts also resemble the taut ‘zips’ which would articulate the colour-fields of Barnett Newman, binding void to surface; what he called ‘the plasmic image’ in which ‘the sublime is now’. The frieze at the Villa Of Mysteries enscenes initiate-wall-gap-beyond, but Newman’s *Vir Heroicus Sublimus* ‘includes’ the beholder before it, who gazes into its crimson abyss like Friedrich’s cliff-top

wanderer. Likewise, the Resor’s glass pavilion turns the atrium of the Pompeian villa inside-out: the ‘outer transcendental’ of the Wyoming vista reflects the ‘inner primal’ of the onyx wall. In both, as Newman put it, ‘the subject matter of creation is chaos.’ Or, as Ruskin beheld in the Alps: *‘There was no thought in any of us for a moment of their being clouds. They were as clear as crystal, sharp on the pure horizon sky, and already tinged with rose by the sinking sun. Infinitely beyond all that we had ever thought or dreamed – the seen walls of lost Eden could not have been more beautiful to us; nor more awful, round heaven, the walls of sacred death.’* (Praeterita, p.103 London 1949)

Ruins revisited: modernist conceptions of heritage

Brigitte Desrochers

The perception westerners have of ruins underwent drastic transformations in the second half of the twentieth century. The realities of World War Two and the growing number of environmental problems made everyone realise that a ruin can be more than some enchanting reminder of distant cultures. Ruins stopped being objects of desire, precious anachronisms for adventurers to appropriate. This paper surveys emerging sensibilities towards ruins in literature, arts, archaeology and architecture. It presents a new vision, quite opposite to, but as powerful as the Beaux-Arts perspective.

Introduction

Things are things, and man is only man.

(Alain Robbe-Grillet)

When post-modernism died it seemed to have taken history away with itself. The issue almost disappeared from the pages of the magazines in the 1990s. Has it really vanished? Is this really the ultimate era of the *carpe diem* – pleasure of the moment?

In many extremely positive ways, it is. Designs are no longer burdened with anecdotes about the history of a site, or metaphors about the pasts or futures of a building type. Architects prefer to deal with what makes it worth our while to be in the here and now: they present us with, say, stones that mean to be nothing but stones. There is no point in looking any further, no story, no moral, not a single reminiscence: what one sees is what one gets. Marcel Proust would be at a loss, Nathalie Sarraute would exult.

A certain sense of history has vanished, but history itself has remained, untouched by critical discourses, saved from being 'put in a nutshell',

and from being quoted and commented upon all of the time: it has had a nice, a well-deserved period of grace.

Thanks to this relative tranquillity, a new and extremely well-balanced conception of what ruins are, and of what they do in our environment has been taking shape. It is 'new' insofar as it highlights most of what the post-modernist interpretations ignored. It writes itself in the materials, more than in the typologies of buildings. It sees the geological events inscribed in the stone as much as the technological regimes written in their fetching, their quarrying, their cutting, squaring and their assembly into larger structures. It also examines how buildings degrade over time, through wear and tear, through erosion, arson or putrefaction. That 'other' history has to do with a world constantly made and unmade through the combined action of people and nature.

It draws from ideas a century old, or more: Sadi Carnot's concept of entropy, Nicolaus Steno's approach to archaeology, Alois Riegl's concept of Age Value. It also bears on Fernand Braudel's

New History, Lewis Binford's New Archaeology and on the extremely lucid debates of twentieth century Italian restorers. Two astonishingly destructive wars, the atomic gloom, a number of environmental disasters and growing problems of waste disposal all contributed to the waning of the romantic outlook on ruins, and the maturation of this extremely prosaic conception of the life of buildings in time. Modern architects, artists and writers explored this sensibility through their respective media, contributing each in their own way to a fairly austere, but highly credible definition of the ruin at the turn of the millennium. This article presents a selection of these antecedents. Our purpose is not so much to 'write history' as much as it is to highlight affiliations between ideas from today and from the recent past. Only in this way can what now reads as little but a bag of intriguing attitudes be transformed into a researched, articulate and usable terrain.

The new humility

Perhaps the single most important factor in the transformation of our sense of history lies in a changing perception of the *rapport de forces* between the ambitions of society, and the supporting capacity of environment. The new sensibility was already perceptible just after the Second World War, in the extraordinary silence surrounding 'what just happened'. More ruins were created in that war than in a millennium of conflicts, causing many to doubt whether humans were, after all, capable of managing the dominion they had acquired over their environment.

In this context, Hannah Arendt writes *The Human Condition*. The only politically responsible way of dwelling on earth, she maintains, is to understand that we are not entitled to interfere with the workings of nature. We must observe without intervening, understand without controlling. This was a novelty in twentieth century political theory, dominated as it was up to then by interventionist interpretations of the idea of Progress. 'It is a sham to win the war',¹ adds Curzio Malaparte 'in a low voice' at the close of *La Pelle* (The Skin), a book about the utter lack of aspiration of the Neapolitans when their city is 'freed' by allied troops. It appals him to see such abandonment, but in the end he prefers it to the presumption of the strong. He moves way beyond nationalist points of view, ultimately arguing that there is great beauty in the sort of humility one acquires after being overwhelmed by history. From the 1950s onwards a series of environmental scares – the unintended consequences of man-made technologies – manifest themselves, allowing the whole of the developed world to experience a similar sense of powerlessness. Over and again, the grand perspectives of progress seemed to narrow themselves down in uneasy, and unexpected ways. In 1970 one of many commentators observes that:

Twenty years ago, physicists faced the fact that there must be something called anti-matter to go with the matter they knew so well. Today economists are facing the fact that besides the materials, wages, prices, productivity, capital investment and profits which they know so well, there stands a world of dis-economy, of externality to the internality of that

system, full of things like high laundry bills and the repair and decoration of buildings and the hospital beds occupied by all the bronchial patients and by how many noise-neurotics God knows. It contains the foulness of rivers, the foams of streams, it contains the Tees-side mist, it contains the new and not yet fully understood mixtures of chemicals which industry discharges into rivers and the sea; it contains the stink of urban traffic, the big jet noise, the alepidopterous field which remains unfertilised and delights no one.²

The multiplication of these backlashes sobered the western expansionist mood, bringing about what an editorialist of the *American Institute of Architects Journal* called 'The Reluctant Acceptance of Finitude' in 1980:

One of the sweeping and profound perceptions of the decade just past – a perception so profound that it has yet to be fully appreciated – is that the real promises held out to us, however exciting and however hopeful, are still in the end finite. The realisations that much of America is now built, that we cannot go on forever wasting energy to build new buildings and maintain them, that we can learn to reuse whole collections of old buildings we already have, and even that we can once again cherish merely the ideas that buildings in the past have embodied – all of these things are, I think, specific responses to a new and broad ethic of conservation which is itself a response to the perception that our resources are limited. Gloomy? Perhaps, but realistic also comes to mind, and with that the

chance to make architecture really responsive to the real world.³

'Experts' eventually accepted that aggressive expansionism no longer was a winning ticket, and that no matter how well-informed humans were, they could never consider nature the way conquerors consider the conquered. New theories were designed picturing a world capable of 'answering back' to human interventions. Gaïa and Systems Theory allowed one to conceive of nature not as an intersection of various inflexible laws, but as an organism constantly moving from one configuration to the next, and seeing all of its local properties modified at each movement. Nature ceased to be virgin and defenceless; it acquired a personality, and some reactive potentials. It was renamed, and called 'the environment'. By the same token, history ceased to be an open stage waiting to be animated by the deeds of the great. It began to feel like a much more confined environment, which imposed its own laws upon humanity, and determined what its possibilities of self-realisation would be. Everywhere the notion of context grew in importance, and with the blossoming of ecology and the social sciences, it showed its complex and powerful character.

The notion of entropy was one of many concepts allowing one to navigate the murky waters of environmental determinism. As soon as the new science brought it back on the agenda in the 1950s, entropy began to influence literature. Thus, the anti-hero was born, an end-of-a-millennium character who sees, and gracefully accepts that the motions of the world are foreign to human ambition, and that history can be crushing.

For Calysto, Thomas Pynchon's 1957 anti-hero, the law means that 'an isolated system – galaxy, engine, human being, culture, whatever – must evolve spontaneously towards the condition of the more probable'. This conception takes him,

in the sad dying fall of middle age, to a radical reevaluation of everything he had learned up to then; all the cities and seasons and casual passions of his days had now to be looked at in a new and elusive light. . . . He found in entropy or the measure of disorganisation of a closed system an adequate metaphor to apply to certain phenomena in his own world. He saw, for example, the younger generation responding to Madison Avenue with the same spleen his own once reserved for Wall Street; in American consumerism, he discovered a similar tendency from the least to the more probable, from differentiation to sameness, from ordered individuality to a kind of chaos. He found himself, in short, restating Gibb's prediction in social terms, and envisioned a heath-death for his culture in which ideas, like heath-energy, would no longer be transferred, since each point in it would ultimately have the same quantity of energy; and intellectual motion would, accordingly, cease.⁴

Those who died in the wars, those who merely survived, the loser, the anti-heroes are but variations of the one overarching figure of the progressive man betrayed by progress. They are all learning to face the world without 'strategies of action', without 'resolute purpose'. Without plans, without means, they learn the aimless courage of survival.

The *nouveau roman* is the continental equivalent of this research. In the space of a few decades, this experimental movement divested the older hero of his traditional, bourgeois prerogatives. In Nathalie Sarraute's words, he 'has, little by little, lost everything: his ancestors, his well-constructed house, filled from basement to attic with objects of every kind . . . and, above everything else, he lost this most prized possession, his character which belonged to no one but himself. He even loses his name'.⁵ Like Malaparte's Neapolitans, like Anne Frank in her cache, the post-war characters are wise enough not to invest themselves in anything that might crumble in their hands.

It is a reductionist mood, which lets things be things, have their own language and their own ecology. The splendid autonomy of the material world, and this very novel idea that humans are not necessarily bettering the order of things when they act upon the world opened the way to a tremendously productive wave of exploration in the visual arts.

In America, Robert Smithson began his Site Selection Studies. He pointed at sites such as strip mines which had been exploited, abandoned and then simply sat there as proof of the fact that entropy was a very real force inside the machinery of modernity:

I guess it's what we call blind profit making. And then suddenly they find themselves within a range of desolation and wonder how they got there. So it's a rather static way of looking at things. I don't think things go in circles. I think things just change from one situation to the next, there's really no return.⁶

After the Site Selection Studies, he begins his Non-sites, boxes filled with materials collected in natural settings, quarries and dumps. He insists upon the fact that these materials were 'out there', that they formed themselves of their own accord, following the natural slope of entropy. They come raw into the space of the museum, the boxes are no more than containers making that rubble compatible with the perceptual rituals of the art world. The boxes 'domesticate' the material to a certain extent, but only to have it affect the viewer more powerfully: 'I'm not doing the scattering, the scattering has already been scattered. I'm consolidating the scattering and heightening the loss of focus. It's that loss of focus that interests me, you know, the perception always evading.'⁷

The research is absolutely straightforward: Smithsonian and the minimalists are not trying to provoke a grand crusade against decay. They travel the other way, they simply mean to show that beneath the surface of the brand-new, super-washable, air-conditioned, environmentally controlled life-worlds of modernity there exists this other, more fundamental layer demanding a quality of perception of a completely different order. They say 'this, too, is life'. They stand beside 'those things' they brought from the field like kids taking part in an object lesson. They describe it: it is factual.

In the meantime, the much-delayed construction of the memorials of World War Two and the heavy criticism of the Vietnam War add to the growing sense that a culture should not necessarily have the upper hand over the whole of history. The classical *Veni Vidi Vici* implicit in Beaux-Arts interpretations

of Antique ruins is replaced by a much cooler 'live and learn' extracted from the damages of twentieth century war and industry.

The archaeological outlook

Archaeologists followed a similar trend as they moved their investigative focus away from high-end artefacts and towards more humble, and more piecemeal evidence. 'One shouldn't hide from the fact that the search for stunning artefacts is one of the goals of archaeology', writes André Leroi-Gourhan, 'but one must acknowledge that, in the last half century, its methods were enriched by the study of what might be called the by-products of excavation: small animal and vegetal debris, modest traces of the passage of man. Finally the sediments themselves, this veil which the old archaeologist moved out of his way as quickly as possible, have become an important source of information'.⁸ Objects are related back to context, and context increases in importance as the century progresses. Accidental debris grows in importance relative to designed objects, while natural settings become more than pretty backdrops to man-made worlds.

The symbolism of the high-end artefacts, once a source of unending fascination, becomes increasingly suspect. The 'New Archaeologists' (also called Processual Archaeologists) strike it out of their agenda. Lewis Binford, leader of the movement, affirms that 'The archaeological record is not made up of symbols, words or concepts, but of material things and arrangements of matter'. He proposes to orient current and future research towards a study of 'how the material things came into being,

about how they have been modified, and about how they acquired the characteristics we see today'.⁹

Binford insists upon the fact that these transformations are not limited to the construction process. They also encompass the 'unmaking' of things: the wear and tear of objects and their eventual disposal, for instance, as well as processes of decomposition, compacting and erosion. Architects and constructors are given an infinitely humbler role, in scenarios primarily concerned with 'the operations of living systems, all of which are dynamic, "flow-through" systems, in which energy is captured and its potential reduced. ... The archaeological record must therefore be viewed as matter transposed and organised during the process of energy use and entropy production'.¹⁰

Twentieth century technologies enabled archaeologists to perceive better the issues which had suddenly moved up their scale of values. Geological surveys became more expansive and more detailed as the century progressed. They provided invaluable baseline maps upon which to install archaeological information. They were also extremely helpful to situate the quarries where building materials were taken. Phosphate tests helped determine where food remains had been grown, pollen analysis afforded indications about the local flora, while dendrochronology correlated specific sequences of tree rings with historical dates. Dating techniques were developed on the basis of a better knowledge of the mechanisms of degradation of matter: neutron activation, obsidian hydration and, of course, radiocarbon dating.

This zooming in towards things smaller than the eye can see was doubled by a zooming out towards the very large scale, thanks to yet another set of technological implements: the side-looking airborne radar, aerial photography, electric, magnetic and thermographic prospection devices. The development of Geographical Information Systems (GIS) databases allowed for thousands of discrete readings to be aggregated into comprehensive pictures of a region, and for different levels of information to be layered upon a single frame of reference. This resulted in fairly abstract, multi-dimensional pictures showing not so much the shape of ancient worlds as their various physical properties.

This emphasis on regional surveys and the flourishing of non-intrusive methods of prospection means that excavation no longer is an obligatory passage point in archaeological research. The old image of the single archaeologist who 'discovers' a visible, palpable artefact hardly corresponds to contemporary realities. The gentleman-archaeologist has multiplied himself into close-knit teams of collaborators, each doing a fraction of the prospecting and analysis to hypothesise, verify or falsify infinitely more complex, and more dynamic pictures of ancient worlds. Contemporary practitioners lost 'their' discoveries just as the new heroes lost their houses, their coats, their features and their names, just as minimal artists renounced their privilege of authorship.

One does not empathise with satellite images and aggregated data the way one does with hand-made renderings: a map of irrigation channels, a maze of resistivity lines, a sequence of tree

rings or the state of some radioactive isotope cannot move an observer the way an inscription, a drawing or a hand-carved figurine can. Modern archaeologists look at things that fall into place out of their own accord. There is hardly any question of intention, hardly any problem of reception and consumption in what archaeologists examine. The standard themes of cultural history do not apply to the information modern archaeologists retrieve. Still, no one can say it is not culture. It is, in the same disinterested, abandoned way Smithsonian's non-sites were. No one is trying to push their message across, it is over everybody's heads but it remains a humanised landscape.

Behind the superficial stories, at the core of the matter, ancient cultures read as a constantly renewed problem of anchoring a pyramid of activities upon a milieu, and of following its evolution over time. At the end of the day, it does come down to what Smithsonian called a 'process of disintegrating frameworks'.¹¹

Conservation

This shift in emphasis, away from narratives and towards a more abstract sense of Time Passing also marked the development of twentieth century theories of historical preservation. Already in 1849 John Ruskin condemned the flights of fancy in which the Romantics indulged when staring at ruins. He urged his contemporaries to 'Look the necessity full in the face, and understand it in its own terms. It is a necessity for destruction. Accept it as such, pull the building down, throw its stones into neglected corners, make ballast of them, or

mortar, if you will: but do it honestly, and do not set up a lie in their place'.¹² The idea that ruins are all about decay was taken up by Alois Riegl in 'The Modern Cult of Monuments', originally published in 1903.

Riegl's extremely articulate theory is based upon 'the modern notion that what has been can never be again, and that everything that has been constitutes an irreplaceable and irremovable link in a chain of development'.¹³ Everything matters, nothing can be singled out of the flow of material culture. Particular anecdotes enshrined in particular structures almost become irrelevant. What interests the modern reader of ruins is the general movement to which the whole of the material world partakes, that is, time. 'Age Value' thus becomes the keystone of the Modern Cult of Monuments. Patina, erosion, discoloration, stains or more serious damages are, according to Riegl

nothing more than indispensable catalysts which trigger in the beholder a sense of the life cycle, of the emergence of the particular from the general and its gradual but inevitable dissolution back into the general. This immediate emotional effect depends on neither scholarly knowledge nor historical education for its satisfaction, since it is evoked by mere sensory perception. Hence it is not restricted to the educated... but also touches the masses, independent of their education.¹⁴

Just like Pynchon and Smithsonian would later do, Riegl makes up a new breed of viewers, humble and low-flying personages who never manage to single anything out of what they watch. Everywhere they see entropy, vast fields of old

and new rubble. When he presents Rieg's translated text to the American public in 1982, Kurt Forster makes sure his readers will get the point:

Rieg's patient study of historic monuments raised issues other than scholastic distinctions, and it brought more to light than the conflicts between the legacy of the past and the values of the present. At the heart of the matter beats the destructive force of time; and beneath it, like a murmur of the heart, the mortality of culture itself. Its continual demise, accentuated rhythmically by surges of the new and lapses into the old, leaves behind a trail of rubble rather than a museum of achievements.¹⁵

This anti-classical, unromantic view of ruins crystallised under the label of 'scientific restoration' at the 1931 International Conference on Restoration in Athens, where the first international protocol of conservation¹⁶ was drawn up, after the principles of Camillo Boito. It was called scientific, in contradistinction to the 'artistic' leanings of previous caretakers of ruins such as Viollet-le-Duc who demolished vast portions of ancient edifices in order to isolate the one period style he considered to be essential to the definition of the monument. What is more, he modified some of what remained in order to bring it closer to what he called the 'ideal' of the period.

Fakes were rebuking to the 'scientific' mind, and continuous use of the structures seemed better than their museification. Likewise, a clear expression of the multiplicity of uses and interventions for a monument was preferred to stylistic

purity. Interventions were allowed but as soon as they went beyond conservation pure and simple, their contemporary character had to be manifested. Such realism often came under attack, and its articulation with architectural research remained ill-resolved until the Second World War, which contributed greatly to the popularisation of a prosaic approach to ruins.¹⁷

Destructions inflicted upon Italian cities defeated, by sheer number, the ambitions of the more interventionist members of the profession. Their cruel immediacy wiped clean any trace of romanticism that might have lingered amongst conservationists, commanding not affectionate appropriation, but a more distant, respectful attitude. In 'Danni di Guerra e restauro dei Monumenti', Guglielmo De Angelis d'Ossat reckons that:

Today, because of a complex mixture of cultural and spiritual influences, we approach monuments of every form and of any state of conservation, with respect, almost with humility; our generation avoids imposing its ideas upon these monuments, and more than anything, making additions or modifications which could lessen their essence, because we know this would constitute a pretentious act of pride and ignorance.¹⁸

By then, architects often had to integrate ruins into their design projects. Franco Albini had done a number of inspiring projects, showing how a respectful stance towards decaying structures could lead to extraordinarily strong environments. Carlo Scarpa followed in his footsteps and today, Giorgio Grassi is one amongst many who perpetuate this line of action.

In Grassi's work,

The old has always been preserved, at times by force, in its ruined state, as an archaeological exhibition, as something finished, useless, just to be looked at. Something that is only capable of evoking, never of demonstrating, its nature as a structure whose career is at an end, but which has survived by artificial means; that is its condition as a still life. While it sometimes forms a substantial part of the project, its role in these works is always that of a mute, neutral and apparently inert spectator... this is the only authentic, not falsely sentimental version of the ruins of ancient buildings or ancient cities.¹⁹

Sustainability

In the 1960s, the symbiotic ties between the ruin and its milieu manifested themselves in alarming ways, as the eddies of motor boats began to destabilise foundations, as industrial fumes and car exhaust attacked the limestone columns of the Parthenon, and as the supersonic bangs of military planes were suspected of damaging the stained glass windows of Gothic cathedrals.²⁰

When these relationships of cause and effect were established, it became clear that broader policies of environmental management were preferable to physical interventions upon discrete structures. The 1964 Charter of Venice focused upon the environmental aspects of conservation, opening towards a much more diffuse conception of the ruin. Ruins became part of a much wider problem which included the management of natural resources and waste products, derelict land and

endangered species. The word 'sustainable' was slowly entering professional jargon.

Policies to equilibrate what each new development creates, preserves and destroys in the environment are suggested, to control what is increasingly felt to be a 'disease of rapid and wasteful growth'.²¹ In the same vein, some suggested that every time a building goes up, moneys be set aside for its own demolition, should it become obsolete.²² Ideally, a project could have come and gone without disturbance; ZEI, 'Zero Environmental Impact' becomes an objective.²³ 'Few will experience any strong sense of personal accomplishment', warn proponents of ZEI: 'Each designer will become more anonymous. His team will be involved in complex, slow processes of development'.²⁴

ZEI lets one conceive that architectural greatness is not a function of the size of a project, but of the intelligence of the environmental transformation. This approach has not enjoyed a long and strong life in the design disciplines, but it triggered a host of parallel experiments in the use of low-energy construction processes and materials. There is hardly any need to call attention to the 'recycling architects' who deliberately ignored the symbolic value of the objects they handled, considering nothing but their material properties and their potential uses.²⁵ They were joined by a growing number of individuals who began to refurbish old homes, and who greatly enlivened the very wide field that lies between the recycling of rubbish and the attentive conservation of historical monuments. Museum conservation and waste disposal might, after all, be nothing but two opposite ends of the same problem, that is, the management of decay in a finite world.

Conclusion

This juncture is probably as powerful as that reached by the Beaux Arts but it is not celebrated with the same pomp. In the first part of this paper, a link was established between this new sense of saturation, and a rapid loss of prestige of all the values associated with domination. Selfless, humble characters appeared on the literary scene. Minimal artists gave up their privileges of authorship: they just picked up things and showed them to their public, convinced that this was the more responsible way to go about the making of things. Archaeologists stopped being concerned with only ancient art works, they began to study all things – what was deliberately shaped, what was accidentally produced, and what had barely been touched by ancient dwellers. Restorers moved towards a similar viewpoint, along with architects and landscape architects. Because this transformation reads like a disappearance, it is easy not to see it; because it moves towards humility, it is also easy to misjudge its importance. That is probably the biggest problem with the new attitude towards history: it is too transparent. It is too easily overlooked.

Notes and references

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3. Gerald Allen, 'The Reluctant Acceptance of Finitude', *AIA Journal* (January 1980), pp.64–5.
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5. Nathalie Sarraute *L'ère du soupçon* (Paris, Gallimard, 1956), p.61. (My translation).
6. Robert Smithson, 'Entropy made visible' (1973) in Jack Flam (ed.), *Robert Smithson: The Collected Writings* (Los Angeles, University of California Press, 1996), p.309.
7. Four conversations between Dennis Wheeler and Robert Smithson (1969–70), in Eva Schmidt (ed.), *Robert Smithson: The Collected Writings*, pp. 218–19.
8. André Leroi-Gourhan, *Le Fil du Temps; ethnologie et préhistoire 1935–70*, in *Le Temps des Sciences* (Paris, Fayard, 1983), p.135. (My translation).
9. Lewis Binford 'The Pompeii Premise in Archaeology', in *Working at Archaeology, Studies in Archaeology* (New York, Academic Press, 1983), p.234.
10. Lewis Binford, 'Translating the Archaeological Record', in John F. Cherry and Robin Torrence (eds) *In Pursuit of the Past* (London, Thames and Hudson, 1983), p.19.
11. Robert Smithson, 'Art through the Camera's eye' (c. 1971), in Jack Flam (ed.), *Robert Smithson: The Collected Writings* (University of California Press, Los Angeles; London, 1996), p.375.
12. John Ruskin, *The Seven Lamps of Architecture* (London, Smith Elder, 1849).
13. Alois Riegl, 'The Modern Cult of Monuments' in *Oppositions 25* (Rizzoli, New York, 1982), pp.21–2.
14. *Ibid.*, p.24.
15. Kurt Forster, 'Monuments/Memory and the Mortality of Architecture', *Oppositions 25* (Rizzoli, New York, 1982), p.15.
16. See Carlo Perogalli, '*Monumenti e metodi di Valorizzazione; saggi, storia e caratteri delle teorie sul restauro in Italia, dal medioevo ad oggi*', *Libreria editrice politecnica Tamburini* (Milano, 1954).
17. According to Perogalli, some restorers continued to insist on reconstruction, while others defended a case-by-case approach defeating the very possibility of having 'general principles'.

18. Guglielmo De Angelis d'Ossat: 'Danni di Guerra e restauro dei Monumenti', in *Atti del V convegno nazionale di storia dell'architettura* (Alberto Calza Bini, Casa Editrice R. Nocchioli, Florence, 1957), p. 13 (My translation).
19. Giorgio Grassi, *Architecture, Dead Language*, (New York, Rizzoli, 1988).
20. See Pierre Kellberg, 'Menace sur les monuments' in *Connaissance des Arts 202* (December 1968), pp.118–9.
21. See Eldridge Lovelace, 'ZEI design teams and other futures', *Landscape Architecture* (January 1972), pp.119–21.
22. Earl Finker, 'Non-Growth Professionals Needed to Help Slow Things Down', *Landscape Architecture* (April 1974), p.168.
23. Reported by Kent Kleinman and Leslie Van Duzer in 'Detroit's Michigan', *Arkkitehti 2* (1997).
24. Eldridge Lovelace, *op.cit.*, pp.119–121.
25. The most famous manifesto of the recycling architects is probably Martin Pawley's *Garbage Housing* (London, Architectural Press, 1975).

Part 4

Narratives of domesticity

It is no surprise to find that the texts collected on this subject represent a consistent strand of thinking in contemporary architectural theory, and one around which there is not only a sense of critical purchase, but also considerable dialogue and debate. A focus on the 'culture of dwelling' invariably has a historical dimension, tends to incorporate a critique of modern architecture, and is informed by developments in feminist thinking about concepts of domesticity in the home.

Isabel Allen's *Creating space out of text* presents in epigrammatic form a set of parallel narratives examining, from the perspective of the picturesque, the middle-class domestic life characterised in Jane Austen's novels. Introduced in relation to the ideological context of the period, her oblique approach uncovers unsuspected insights, for example between empirical concerns and social convention. The text illustrates the critical, and methodological, opportunities offered by an interdisciplinary subject, engaged here with a reflexive self-consciousness characteristic of other papers in this section.

In contrast, Gülsüm Baydar's revealing scrutiny of images from popular magazines in the Turkey of the 1930s, was presented at a colloquium in Louvain organised in 2001. The publication of the meeting, edited by Hilde Heynen (JoA v7 n3, Autumn 2002), stands out, both for its thematic coherence and the critical acumen of the participants (not always evident in the papers produced for such events). Baydar's ideological rigour, yet ability to pursue the discursive opportunity, informs a sophisticated examination of the impact of gender and sexuality on conceptions of domestic architecture conditioned by the attempt to build a 'modern' Turkish republic.

Bart Verschaffel's more philosophical engagement with the subject, in his examination of Dutch seventeenth-century paintings, takes issue with simplistic readings of the domestic realm, associated with a feminine domesticity. This prompted a provocative discussion session in Louvain, unsettling the journal's putative objectivity.

Creating space out of text: perspectives on domestic Regency architecture or Three essays on the picturesque

Isabel Allen

This paper examines the landscape and architecture of a Regency country house using Jane Austen's texts as 'proof' of the way these spaces are used and perceived. More general historic, political and social sources are examined in order to locate the behaviour and perceptions of Austen's characters in terms of the aesthetic sensibilities of the Regency middle classes in general. The broader social/political issues that mould Austen's physical surroundings are divided into land distribution and class, gender, and nationality. Essays on these issues are splintered, with fragments appearing where they are relevant to the primary narrative – middle class domestic life – reflecting the fact that the political/cultural outlook of a social class tends to be conscious only when it touches on more immediate concerns.

Essay 1 On the relationship between picturesque landscape and political agenda

Essay 2 On the dual role of woman, as both active and passive partner in the picturesque gaze

Essay 3 On the picturesque construction of 'Englishness' (as perceived through the medium of the middle class dinner)

Column 1

The first column tells a story. The setting is Longbourn, the fictional house belonging to the Bennet family of Jane Austen's *Pride and Prejudice*. It focuses on the spaces that would be experienced by the visitor – the approach to the house, the public rooms, and the views that their windows afford.

The narrative is located in 1812. *First Impressions*, an early version of *Pride and Prejudice*, was written in 1789. Although it was not published in its present form until 1818, research suggests that the revisions were largely carried out in 1812.¹ More specifically, the focus is on the hours between 2pm and 10pm, following a dinner party guest through the preparations, the journey, and the dinner party at Longbourn.

The narrative assumes the existence of two fictional characters. The first is the dinner guest, young, single, female, and unfamiliar with the Bennets' habits. The second is an older acquaintance of the Bennets to whom she has written for advice on how to behave and what to expect. The narrative takes the form of the reply.

The authorial voice takes us through a series of gestures that enrich an understanding of the way we experience this journey through space – locating ourselves within a social class, putting on a Regency dress – so that our perspective is limited to that of an early Regency middle class female.

Column 2

The second column offers a series of quotations taken from *Pride and Prejudice* and from other Jane Austen novels.² They are accurate, but they are not in order, and are not necessarily in context. They have been reformatted to create a new fiction. To maintain the integrity of the fiction, quotations have not been attributed to characters. The quotations are concerned with appearance, creating a (disjointed) account of the experiences and perceptions of a class concerned solely with consumption.

Whereas the quotations are divorced from their context, the commentary is concerned with context, pulling out patterns and implications in Austen's novels that support the diagrams in Column 3 and the written assertions in Column 4. As a concern with appearance and immediate experience unfolds into analysis, we begin to view our story and our journey in terms of our own historical and cultural viewpoint.

Column 3

The third column examines the factors, both physical and ideological, that mould the way the Regency middle classes perceive and experience their surroundings. Emphasis is placed on visual aspects. Other factors, such as acoustics, physical comfort and ideology, are taken into consideration where they relate to the experience or perception of space.

Column 4

Column 4 is concerned with the picturesque, a term applied to the aesthetic and cultural perceptions of the leisured classes. During the first half of the eighteenth century the term was applied to landscape. By the 1770s its vocabulary and ideas were applied to the arts, but also to tourism, bridging the gap between the viewed and the viewer. By 1810 it was virtually synonymous with the outlook of the middle class.³ In terms of its early aesthetic agenda, the picturesque offers an insight into the design and representation of the physical environment. An investigation of its mature form, as an ideological tool, shows how the physical environment is perceived. The picturesque operates within existing physical and legal controls – property laws, servants' quarters. Its power lies in its ability to affect the way space is designed, perceived and used, legitimizing existing systems and adding its own means of spatial control.

The clearest example of legitimization is the way the distribution of land is presented as natural. A taste for irregularity and decay ensures that the 'natural' is also pleasing. The injustice that underlies this system is idealized or concealed. Motifs of the contented hermit or the pretty cottage portray poverty as blissful innocence. Austen's texts demonstrate how dependence on marriage makes women susceptible to perceptions of attractiveness, allowing the picturesque to influence physical existence to a subtle degree, dictating when and how to stand or to sit, to whisper or to smile. Women view their surroundings,⁴ and to an extent themselves,⁵ from the picturesque perspective – they are active as well as passive partners in the picturesque gaze. I aim to locate women's position within the picturesque by demonstrating both how they are seen, and how they, and their menfolk, observe the world in which they live.

Some time in advance

Do not depend upon an invitation to dine with the Bennet family. They have a reputation to think of, and will not taint themselves with your acquaintance unless they are quite certain of your credentials. If you do receive an invitation, be sure to check the calendar so that you may be assured of a safe ride home. The country lanes are too dark to travel without moonlight. The Bennets will probably invite you for four o'clock. This is a common hour amongst country folk of their class. It may be that they dine a little later when they are expecting company.

I do not think there is a larger neighbourhood for, you know, we dine with four and twenty families.⁶

When Elizabeth Bennet walks three miles after breakfast to her 'neighbours', humbler dwellings on the journey would be all but invisible. Fashionable quaint tenant cottages are part of the landscape rather than the homes of 'real' people. Elizabeth arrives at Netherfield to find Mr Hurst 'thinking only of his breakfast'.⁷ Evidently the Hursts and the Bingleys keep later hours than the less affluent and rather provincial Bennets.

Mrs Bennet has unmarried daughters to dispose of. You will be welcome at her table only if you appear sufficiently refined to elevate the status of the family, whilst sufficiently plain to deflect any particular interest from yourself. If your manners are good, but your pedigree leaves a little to be desired, you may be invited after the meal, to drink tea, and to be entertained. Do not despair. You will have ample opportunity to display your charms. A little deficiency of breeding in a woman may be overlooked by a man sufficiently captivated by her beauty.

Pray, is she out? or is she not? I am puzzled. She dined at the Parsonage . . . which seemed like being out, and yet she says so little, that I can hardly suppose she is.⁸

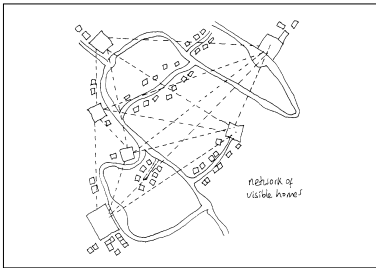
Formal status dictates female appearance and behaviour. Tom Bertram's disgust at Miss Anderson's transformation from shy girl to assertive woman reflects both the extent and the limits of female visibility. If she is not on the marriage market, a woman should be silent and invisible; if she is, she may ensure that she is noticed, but a woman who steps over the boundary is despised.

The day of the party

It is essential that you look your best, without appearing to have made any effort at all. Eradicate any traces of artifice from your appearance. Apply just enough blusher to appear naturally flushed. If possible wear a new gown; otherwise choose a gown of the purest white and the simplest design, and ensure that it is spotlessly clean. Avoid eating for a day or two beforehand; remember that the dress is to cling to your body in the most natural way.

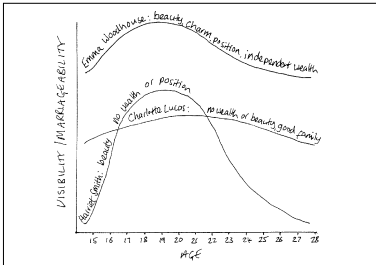
I would advise you merely to put on whatever of your clothes is superior to the rest, there is no occasion for anything more.¹⁰

The appearance of effortless simplicity is a cause of concern, time and expense. Catherine Norland 'lay awake ten minutes . . . debating between her spotted and her tamboured muslin'.¹¹ The fashionable Bingley sisters require an hour and a half to dress. Edmund Bertram echoes the prevalent taste for an appearance of natural innocence in assuring Fanny that 'A woman can never be too fine while she is all in white.'¹²



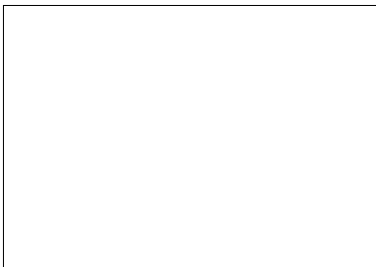
The selective vision of the gentry ensures that the same geographical boundaries contain two distinct neighbourhoods. From an economic perspective, these are the spheres of production and consumption. One is the world of social intercourse, the other is its background, to be gazed upon, walked through, patronized.⁸ Within the leisured classes, further degrees of separation are maintained by the hours that are kept. The very wealthy are freed from the economic necessity of cooking and eating by daylight, and celebrate this independence by rising, eating and sleeping later than their less affluent neighbours.

Essay 1



Within a social class, degrees of visibility are determined by status and gender. Women are divided into visible and invisible guests. As the crucial partners in the propagation of their social class, marriageable women have an elevated status. The social circuit provides the architectural site for the transactions of the marriage market. Married women or 'old maids' are valuable as chaperones, negotiators and confidantes. They are invited, but they are not expected to be centre stage. Women who are not 'out' are not invited at all.

Essay 2



Having secured the right to be seen, a woman must appear to advantage. The quest for the 'natural' has inspired a move away from structured fashions towards an emphasis on the figure. Dresses float and cling, so that the best dressed ladies are 'at once expensively & nakedly dressed'.¹³ The picturesque sensibility defines women, like landscape, as passive objects of the gaze. That both are subject to the same terms of appreciation is expressed by Uvedale Price's insight that 'it is common to say of a woman – *que sans être belle elle est piquante* – a word, by the by, that in many ways answers very exactly to the picturesque'.¹⁴

Essay 2

The journey there

On the journey to the Bennets, you may relax and enjoy looking at the countryside. As the house comes into view, you will notice the contrast with the wildness of the surroundings. Its perfectly proportioned facade is set off against a background of dense dark trees. The rattling of the carriage and the crunching of the gravel alert the household to your arrival.

a road of smooth gravel winding round a plantation led to the front . . . the house itself was under the guardianship of the fir, the mountain-ash and the acacia, and a thick screen of them altogether, interspersed with tall Lombardy poplars, shut out the offices.¹⁵

Mary Crawford is staggered to find that haycarts are required for harvesting when she needs one to transport her harp. She sees a picturesque landscape, where offices and outbuildings are screened, leaving the house, like the landscape, as a picturesque object, disconnected from associations of work.

Quarter to four

A servant will greet you at the door and show you to the drawing-room, where you will be greeted by a tableau of contented family life. The Bennet daughters will look their best. If you are the first guest to arrive, you will find them engaged in suitably feminine occupations, such as practising the harp, or doing a little embroidery.

they followed the servants through an ante-chamber¹⁷

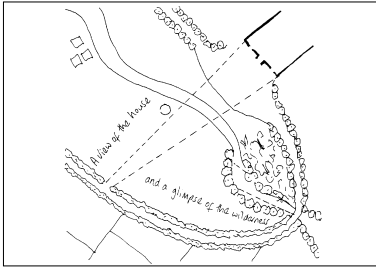
Mr Bennet has his library, but his wife and daughters have no retreat other than their bedrooms, and must always be ready for company. Mrs Bennet is thrown into a panic when Bingley and Darcy arrive early. Her daughters have not dressed for supper. A few minutes later, they could have been found casually at leisure in the drawing-room giving no indication of the effort that had gone into their appearance.

Ten to four

Once inside the drawing-room it would be polite to drift towards the window. The preoccupation with landscape makes prospect a matter of some pride, and the view from the drawing-room window has probably been contrived at considerable effort and expense. Through the shrubbery and the 'wilderness' you may glimpse the hermitage. Dark trees in the foreground limit the roivings of the eye.

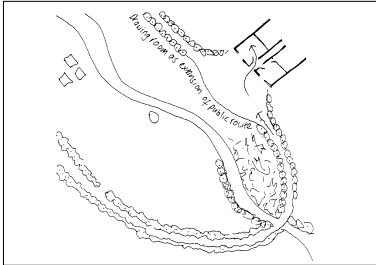
I think she will be pleased with the hermitage¹⁹

The hermitage symbolizes power over uncontrollable classes. Like the gypsy, the hermit is unknown, and potentially threatening. In idealized landscapes, whether actual, like the Bennets' garden, or represented in paintings, poetry or novels, they take on associations of simplicity and romance. Edward Ferrars mocks this inconsistency when he shocks Marianne with his assertion that 'a troop of tidy, happy villagers please me better than the finest banditti in the world.'²⁰



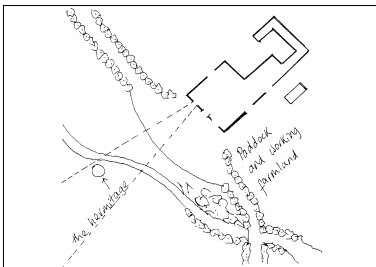
Travelling from one 'visible' home to another, the landscape is the subject of the gaze – to be looked at rather than to be worked.¹⁶ Labour is incorporated into the view where it is suitably picturesque – landowners transform shack into quaint cottages. The mathematical grids of enclosed land are entirely at odds with the picturesque perception of the unspoiled countryside, and are screened by dense hedges. Compositions are defined by limiting observation points. Gaps in the trees afford fleeting visions of an idealized natural landscape. Outbuildings are screened by trees as the house becomes the focus of the composition.

Essay 1



An increasing trend for close communion with 'nature' ensures that living-rooms are on the ground floor. Where space is limited, private rooms are allocated to the male head of the household. Women carry out their lives in the public rooms. The moment a visitor arrives, the house becomes a stage set, and the women are on display.¹⁸

Essay 2



Moving through the space to the window, the house takes on a further transformation, playing the part of a theatre box: the comfortable, covered vantage point from which to gaze outward. The hermitage is a typical focus for the view. Gilpin suggested that figures in landscape should not be associated with work.²¹ The hermit is particularly attractive as a symbol of depoliticized poverty. With revolution in France fresh in the memory, political demands of the poor are especially threatening, and it is easy to see the appeal of the willingly marginalized hermit, who has denounced his stake in the economy.

Essay 1

The truly fashionable have eroded the distinction between inside and out with the addition of French windows opening onto a conservatory. Mrs Bennet, however, is not sufficiently wealthy to appreciate the charms of affected rusticity. In any case, glass is too expensive to justify such an extravagance. The gridded panes of the sash window are a stark contrast with the informality of the view.

*she . . . was but slightly affected by his enumeration of the windows in front of the house, and his relation of what the glazing altogether had originally cost.*²²

The Musgroves of Kellynch have installed fashionable French windows. When General Tilney idly considers adding a patched-on bow window to Henry's parsonage, he speaks as a man of ample means; he need not fear that the added visibility afforded by a bow window will mar the view, as there is no shortage of picturesque land.

Five to four

Another promising conversational gambit is to admire the watercolours – they are the work of one or other of the daughters, and are just waiting to be admired. Grasp the opportunity now; later they will be obscured by candle-light. They may not be of the highest quality. They will, however, invariably bring forth an earnest view on the picturesque – no self-respecting young lady would be without one.

*What are men to rocks and mountains?*²²⁴

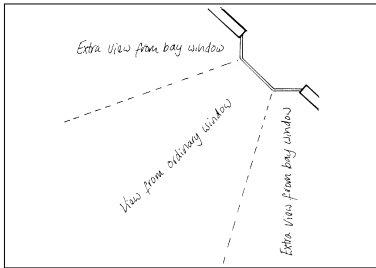
An appreciation of beauty is considered pleasing in a woman. Genuine understanding may be demonstrated by the correct vocabulary, which is second nature to romantics such as Marianne Dashwood, but mocked by the cynical Edward Ferrars, who declares: 'I shall call hills steep, which ought to be bold; surfaces strange and uncouth, which ought to be irregular and rugged; and distant objects out of sight, which ought only to be indistinct through the soft medium of a hazy atmosphere.'²⁵

Four o'clock

You have limited time, before dinner, to assess your standing with respect to the assembled company, so that you may be certain of your position in the procession to the dining-room. The highest-ranking woman leads the way, followed by the other females in descending order of importance. The dining-room is across the vestibule from the drawing-room, but is markedly different in style. While the drawing-room is constantly changing with fashion, the dining-room has remained largely unaltered since the house was built.

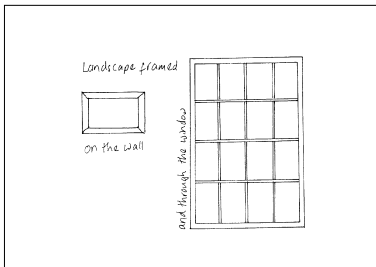
*Ah Jane, I take your place now, and you must go lower, because I am a married woman.*²⁶

The procession can be a fight for status. The Bennet daughters line up in order of age. Lydia assumes that her married status places her above Jane as the oldest daughter. Elizabeth's horror suggests that this is not an inevitable switch. This clash between age and rank is illustrated by the Miss Musgroves' complaint about their sister-in-law's insistence that her position as daughter of a baronet places her above their mother in the hierarchy.



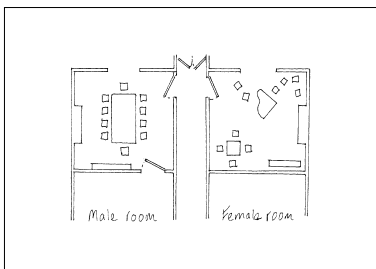
The extent to which the vantage point is fixed depends upon the size, style, and number of windows. Bay windows require an extensive view; rooms with double aspects require more still. The Bennets' drawing-room probably boasts a single window. Window taxes have risen steadily over the last few years, and dispensable side windows have been bricked up.²³ It is a Georgian sash window; its height is one and a half times its width. Each small pane is a scaled-down version of the shape made by three quarters of the window height by its breadth. This provides a static frame for the composition of the view.

Essay 1



The fixed frame of the window parallels the picture frames on the wall. Paintings of landscape are enjoying a new significance in the wake of William Gilpin's influential belief that an appreciation of beauty can be learned by studying pictures. The painted landscape does not display the gridded divisions of the view through the window, but the composition is determined with the same rigorous adherence to proportion. Like the window frame, the picture frame orders the landscape. The professed delight in the wildness of nature is undermined by the need to contain its glories within a controllable form.

Essay 1



Women have an ambiguous relationship to the perspective of men, sharing their homes and, to an extent, their outlook. The fluctuation from passive to active participant of the picturesque gaze is regulated by social and spatial mechanisms maintaining the balance between partnership and inequality. The procession to the dining-room places women on an equal, even a superior footing to men. This implied equality is celebrated in the architectural expression of these two formal rooms. They are awarded equal status in plan and elevation, and tend to be expressed symmetrically even where the rest of the house is informally planned.²⁷

Essay 2

The dining-room is dark, traditional and 'masculine'. The walls are not hung with papers and silks but are panelled in the old style. Look closely and you will observe that family portraits take the place of freshly painted water-colours. The only distraction from the table is the area brought to life by the flickering of firelight. The chimney breast above the fireplace is distinguished by two narrow panels flanking a wider one, which in turn boasts the most impressive family portrait that can be found.

*Mr Collins . . . when I am dead may turn you all out of this house as soon as he pleases.*²⁸

Married couples negotiate separate lives. Charlotte Lucas chooses a small rear sitting-room to avoid her husband. The sanctity of Sir Thomas' rooms at Mansfield Park is such that their appropriation for amateur dramatics is symbolic of the breakdown of the family. Even the relatively cramped Bennets have their territories. Mrs Bennet retires to her boudoir in times of stress, while Mr Bennet orders his family out of his library.

Five past four

Mrs Bennet sits at the top of the table. Mr Bennet sits at the bottom. The old style is for a separation of the sexes. The mistress of the house is flanked by the most senior women, whilst her husband is flanked by the most senior men. The Bennets favour the modern arrangement whereby men and women sit alternately. You must take your seat before the men enter the room, and consequently cannot choose your neighbour. However, a little friendly encouragement may be given by means of a shy but welcoming smile.

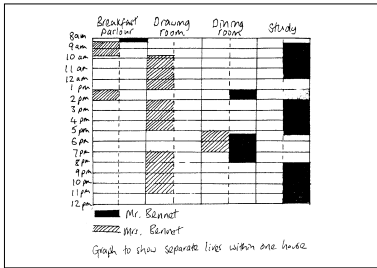
*Jane happened to look round, and happened to smile; it was decided. He placed himself by her.*²⁹

Mr Knightly and Emma sit at opposite ends of the table, and work together as hosts. Physical distance and practical partnership reflect their courtship, based on mutual respect rather than physical passion. In contrast, Frank Churchill and Emma gossip and flirt at dinner, and feel awkward when a lull between courses obliges them to cease their conspiratorial chat. Neighbours at dinner may be unwelcome. Mr Darcy and Mrs Bennet are equally distressed to find themselves seated together.

Choose your seat with care. The meal may go on for as long as three hours. If necessity of nature obliges you to leave the table, it is better to be in a position where you may steal away unobserved, and return without announcing where you have been. The Bennets are rather too refined to keep chamberpots outside the dining-room. The privy should not be too uncomfortable. It is marked by a yew tree, which keeps it cool in summer and less cold in winter. If, however, the weather is bad, or you do not wish to venture into the darkness, ask where you may find a *bourdaloue*,³¹ and leave it for the servant to empty.

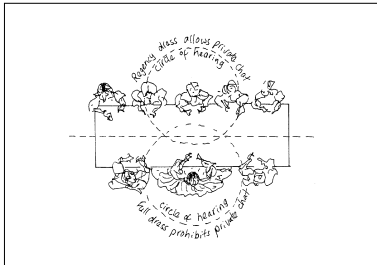
*Elizabeth could bear it no longer. She got up, and ran out of the room.*³²

Marianne Dashwood's fondness for running down hill-sides is a taste she could never have discovered with more restrictive clothing. The link between actions and dress is circular. The romantic sensibility that encourages her to do so also inspires the taste for flowing fashions. Miss Steele's report that 'they were shut up in the drawing-room together, and all I heard was only by listening at the door'³³ shows that she can move so quickly and quietly that she is not noticed at all.



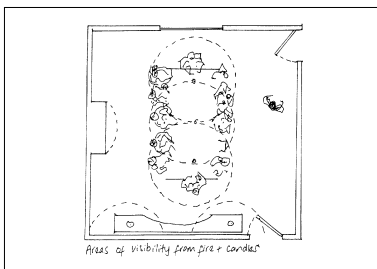
Essay 2

If the size and the position of the two rooms allude to an equal partnership, the decor signifies the unequal terms on which the partnership is built. The traditional dining-room, replete with family portraits, suggests a continuity with the past, reflecting the fact that property is passed through the male line. The freshness of the drawing-room suggests a new or temporary abode; its occupant is in residence only while her husband lives. The distinction between 'male' and 'female' rooms reflects an ideology that accepts, and even assumes, the spatial separation of man and wife.



Essay 2

'Promiscuous' seating (boy girl boy girl) has replaced a more austere system whereby men and women sit apart. Noise from the fire and heavy cutlery facilitates private conversation. The Victorians maintain this arrangement, but changing fashions bring their own brand of modesty. In *The Woman in White* by Wilkie Collins, Marian Halcombe declares: 'In my ordinary evening costume I took up the room of three men at least!'³⁰ A man, necessarily, is separated from her by a space of at least twice his size. With the Regency dress, there is room for more guests round a table, allowing physical proximity and private chat.



Essay 2

The intimacy that the dress allows may be welcome or unwelcome depending on one's feelings towards one's neighbour. There are certain respects, however, in which flimsy attire is an unmixed blessing. In contrast to the hooped skirts of the earlier Georgian period, and the full skirts that come into fashion later, women have great freedom of movement. Marian Halcombe, in her heavy, structured dress, is constrained to a ladylike walk, and cannot move without her silk dress rustling loudly. To eavesdrop on a private conversation, she dresses like a man.³⁴ To leave the room discreetly would be an impossibility.

Proximity to the fire is a further consideration in selecting a seat. The fire is old-fashioned. Much of the heat disappears up the chimney, and smoke often finds its way back into the room, choking people nearby.³⁵ Although you will be cold in your fine gown I would advise you to sit away from the fire, but take care to avoid draughts. The Bennets do not have modern oil lamps, and much of the room is in darkness. I advise you to sit in comparative gloom, rather than in close proximity to the candles. They are made of tallow, and give off an unpleasant smell.

*that young man is not quite the thing. He has been opening the doors very often this evening and keeping them open very inconsiderately. He does not think of the draught.*³⁶

Marianne's ramble in dew-soaked grass in flowing garments fuels a near-fatal illness. Warm rooms are essential for women. Sir Thomas' decision to give Fanny a fire demonstrates his role as benevolent father-figure, in contrast to Fanny's biological father, who keeps the fire-side seat and solitary candle for himself, depriving her of light and warmth, and effectively of space.

After the fussy fabrics of the drawing-room the dining-room may appear stark and austere. The furniture is of waxed mahogany, carved into ornate classical shapes. The floorboards and the lower half of the walls are of English oak. Where the walls are not panelled they are colour washed in a deep blue, chosen to set off the mahogany furniture to best effect. In contrast with the prettily upholstered drawing-room chairs, the seats are of leather.

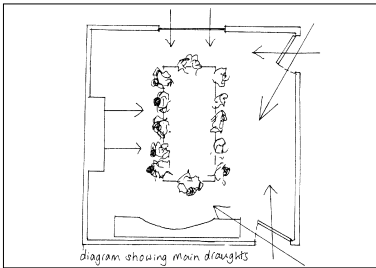
*nothing more striking or more solemn than the profusion of mahogany*³⁸

Mahogany at Sotherton conveys a formality that exaggerates the inappropriate brashness of the Crawfords, as Mary makes frivolous puns, and Henry flirts with Maria. Mahogany (presumably imported) indicates the dignity of the family chapel, which symbolizes the union between church and aristocracy that forms the basis of the English constitution. Contemporary readers would be aware of a distinctly 'French' slant to the disrespectful Crawfords.

The table is covered with a woollen cloth, which in turn is covered with two cloths of linen damask, with a design facing the person at the head of the table. If you feel the need for a napkin use the part of the tablecloth that hangs down in front of you. This is perfectly acceptable, and in any case the cloth will be removed after the first course to reveal the fresh one underneath.

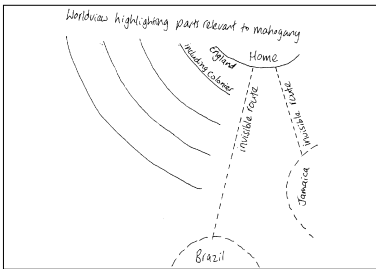
*I wish he may go to the East Indies, that I may have my shawl. I think I will have two shawls.*⁴¹

For Lady Bertram, India is a supplier of cotton, and very little else, as is demonstrated by her reflections on William's possible trip there. She is oblivious to any potential danger. Despite the fact that most of the available cotton is manufactured in Lancashire, and indeed that Lancashire cotton merchants are now exporting to India, Lady Bertram considers her need of a shawl to be sufficient reason for William to travel to India rather than anywhere else.



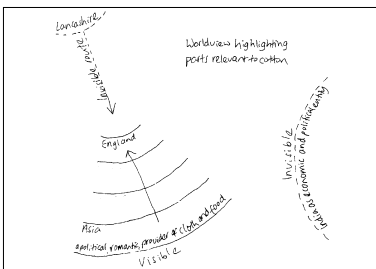
On the negative side, the flimsiness of female attire means that women suffer terribly from the cold. At its most extreme, the 'natural' look requires the wearer, dressed only in nubuck undergarments, to drench herself in cold water before dressing, so the fabric clings becomingly. Draughts are potentially fatal to women suffering from the resulting 'muslin disease'.³⁷ In this respect a woman is the subject of the gaze, moulded to comply with an idealized picturesque vision. In the way she perceives the rest of the world, she is cast in the role of viewer.

Essay 2



A picturesque construction of 'Englishness' assimilates threats to colonial power, and to domestic government. The loss of trade from American independence³⁹ and Napoleon's trade blockades necessitates increased domestic production and new trading partners, which are either idealized or unseen. Jamaica and Brazil are 'invisible' importers of mahogany.⁴⁰ Foreign timber is dislocated from its origins, carved into classical shapes, and knocked into panels redolent of ancestry. In the English consciousness, mahogany is as 'English' as the native oak, pine or elm.

Essay 3



'Exotic' imports exploit the counter-strategy of idealized visibility. 'Hindoo' architecture, and a romanticization of Byron's exploits in warm climates, contribute to the perception of an exotic, even erotic, fantasy land whose inhabitants, like the native hermit, are concerned with the mystical and the sensuous rather than the realities of hunger and economic exploitation. Now that the Industrial Revolution has allowed home-produced cotton to overtake imports, Lancashire cotton manufacturers sell their goods with images of the exotic east.⁴²

Essay 3

Ten past four

The cloth, in turn, is covered with an array of symmetrically arranged dishes. Mrs Bennet may drop a hint as to the number of courses to expect. This is one instance when it would be as well to pay attention to her prattle, so that you may be certain of how much to eat. Expect plain English cooking at Longbourn; the Bennets do not affect a taste for French cuisine. The soup should be eaten first. It is unlikely that the Bennets will serve the fashionable white soup. It is considered distinctly French, and rather the preserve of the wealthy. It is more likely to be a humble pease soup.

*he was an indolent man . . . who, when he found her prefer a plain fish to a ragout, had nothing to say to her.*⁴³

Austen equates solid English food with solid character. Bingley's friend Mr Hurst is more or less introduced and dismissed with his misplaced taste for 'sophisticated' food demonstrating his shallow character. Willoughby's choice of roast beef (good, solid English fare) as sustenance for his trip to clear his character is integral to his new incarnation as an object of compassion rather than a heartless villain.

Half past four

The fish is to be eaten next. Here you may expect something rather more sophisticated. Now that mackerel, herring and cod are available from the Meryton fishmongers, Mrs Bennet has learnt to despise the muddy-tasting pondfish of her youth. After the fish, you may start on the remaining dishes.

*It was a sweet view – sweet to the eye and the mind. English verdure, English culture, English comfort,*⁴⁵

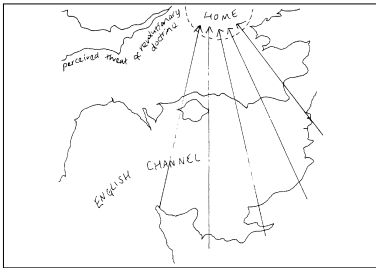
Colonel Brandon and Mr Knightly, as true Austen heroes, keep fruit trees and fishponds. Mr Bennet's land is described in ornamental terms – the hermitage, the wilderness. Mrs Bennet cannot serve fish at an impromptu Monday dinner party (there is no catch on Sunday), revealing that she buys her fish. The frequent trips to Meryton suggest that the Bennets are far from self-sufficient, as we would expect from a lazy and irresponsible landowner like Mr Bennet.

Five o'clock

The corner dishes hold the accompaniments. The large dishes hold several joints of meat and some boiled or roasted fowl. If the Bennets are trying to impress, they will serve venison and partridges. Do acknowledge the presence of game on the table. Do not fear that you will not recognize it. Every meat dish will bear an uncanny resemblance to the animal from which it came.

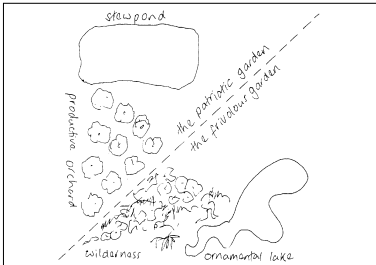
*The venison was roasted to a turn – and everybody said, they never saw so fat a haunch . . . even Mr Darcy acknowledged that the partridges were remarkably well done.*⁴⁷

Mrs Bennet's invitation to Bingley to come to Longbourn when he has shot the game on his own estate is a boast of wealth and plenty, and an exaggerated gesture of friendship. Offering the freedom of the estate is tantamount to an invitation to join the family. Bingley's wealth is greater, Mr Bennet's family has been established for longer, but their shared shooting expedition unites them as members of the same class.



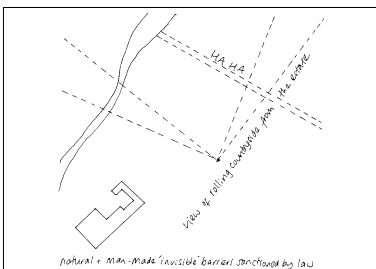
Strategies for aestheticizing and legitimizing international relations are mirrored by strategies to legitimize domestic government in the face of threats posed by French revolutionaries. The mysterious 'hindoo' is mirrored by the sinister 'Jacobin', who exists in the subconscious despite the fact that chefs and émigré aristocrats probably constitute the gentry's French acquaintance. The popularity of cookery writers such as Hannah Glasse, who derides French cooking,⁴⁴ and Elizabeth Acton, who markets 'common sense' as a peculiarly English trait, suggests that even a taste for French food may be seen as bad form.

Essay 3



Just as 'England' includes selected colonies when it suits the necessities of trade, 'English landscape' is defined to suit immediate economic needs.⁴⁶ During two decades of war with France, Napoleon's Continental System has exploited England's dependence on imported foodstuffs as a means of bringing about her submission. Self-sufficiency is an instrument of warfare. An attempt to reconcile the opposing interests of productive land and 'untouched' picturesque landscape is represented by the ideological construction of an 'English' landscape that is at once productive yet devoid of the overt ordering mechanisms of commercial agriculture.

Essay 3



The desire for land to be controllable, productive and picturesque is expressed in the perception of shooting as the ideal pastime for the English landowner. Unlike other home produce, the availability of game does not demand the sacrifice of picturesque landscape. Land ownership, while not expressed by signs of physical control, is clearly encoded in game laws, while the appropriation of land by enclosure ensures that game is the preserve of the landed classes. A landscape is created from which the lower classes are entirely excluded. It is jealously protected. The punishment for poaching is deportation.

Essay 1

The servants will provide clean plates and cutlery as required. To attract their attention place the handles of your knife and fork on your plate. A good servant will notice this signal directly, and anticipate every other want discreetly. With competent servants, and gloomy candle-light, it is too easy to be forgetful of their presence. Never forget that there are certain topics of conversation that a servant should never overhear.

*Thomas and the tablecloth, now alike needless, were soon afterwards dismissed.*⁴⁸

Thomas, presumably, is present throughout this and every other meal, but comes into focus only to report Lucy Steele's marriage. Mrs Bennet shows foolishness by discussing family traumas in front of the servants. Mrs Elton shows shallowness in affecting to forget her servant's name. Mr Knightly shows good character in his strong relationship with William, while Harriet Smith demonstrates the acceptable balance between intimacy and propriety.

Half past five

As a rule, the Bennets enjoy a single course; a second course should be received as a compliment. It will be another symmetrical arrangement, this time of lighter savoury concoctions such as fricassees and patties together with fruit tarts, jellies and puddings. Alcohol makes its first appearance with the dessert. If a gentleman fills your glass and then fills his own, he is about to toast you. Wait until his speech is over before draining your glass.

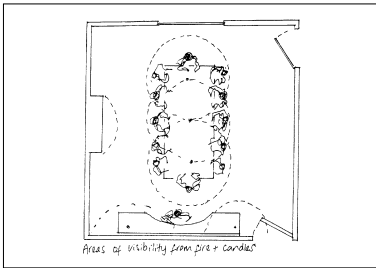
*Mrs Bennet . . . did not think anything less than two courses could . . . satisfy the appetite and pride of one who had ten thousand a year.*⁵⁰

The Coles of Highgate invite male members of the Cox family to dinner; 'the less worthy females' of the same family arrive later with the socially inferior Miss Bates, Miss Fairfax and Miss Smith. Lady Catherine, however, makes no such distinction between Mr Collins and his female relations. They are all invited for dinner until she has more interesting company, when they are all invited only for tea.

Do not help yourself to drink. Ladies should drink rather less than gentlemen, although one or two glasses of wine are perfectly acceptable. Nor should you appear too greedy for the sweetmeats – a feast of dried fruits, nuts, and sweet and spicy confections. They are to be daintily picked at with fingers. This is the most expensive part of the meal; Mrs Bennet is banking on the fact that you are full, and the same delicacies may make an appearance at her next dinner party.

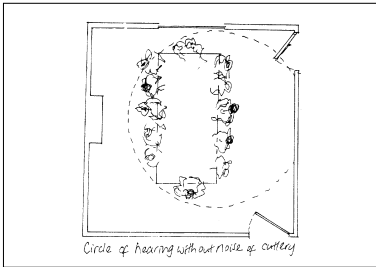
*they had never dined together, without his drinking to her best affections with so much significance and so many nods and winks, as to excite general attention.*⁵¹

Mr Knightly is partial to home-made spruce beer. Mr Weston, who is pleasant, but lacks Knightly's strength of character, serves wine that is presumably French, and certainly European. Mr Knightly gives Mr Elton the recipe for spruce beer, indicating his good influence. Tellingly, Mr Elton makes his ill-judged proposal to Emma when he is slightly flushed from Mr Weston's (foreign) wine.



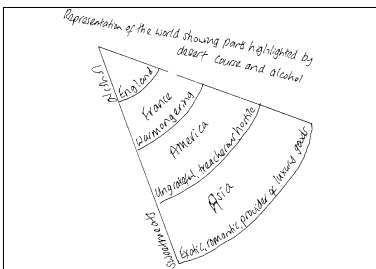
'Invisible' classes, eradicated from the landscape, are less easily screened in the home. The need for their constant presence has been eliminated by the appearance of bell pulls in the 1760s and 1770s, but servants are still essential at mealtimes. To an extent, their existence may be obscured – Sheraton has designed a sideboard with a deep convex curve so that the head servant may carry out his duties beyond the body of the room. Fear of a French-style revolution ensures that they are never entirely invisible⁴⁹ – the lower classes have shown themselves capable of watching and listening, and conversation in their presence is guarded.

Essay 1



Women's superiority over servants is reflected by the time they spend with the men after the servants have been dismissed. The dessert does not require eating utensils, and there are no heavy dishes to move. This eliminates the need for servants and minimizes background noise, making group conversation more relaxed, while discouraging the tête-à-tête. Private flirtations are replaced with the formalized gallantry of the toast, which may be a formal expression of intent, a public acknowledgement of a flirtation, or a sign of respect. The flow of alcohol may induce ribaldry and high spirits, but conversation is still essentially formal.

Essay 2



Home-produced alcohol is the yield of the estate, and a direct rejection of French influence – troubles with France that have plagued England since the late seventeenth century have left French wines and brandies scarce and expensive. The government encourages home-produced alcohol in an attempt to reduce smuggling. Exotic delicacies from abroad reflect the breadth of British trade. They are expensive to eat in quantity, but this course is not intended to appease hunger. It is a symbolic ritual encompassing the double-edged ideal of the exotically foreign and the traditionally English.

Essay 3

Six o'clock

When Mrs Bennet rises to leave the room, be sure to rise too. One of the gentlemen will open the door, and you must walk out in strict order of precedence. The men remain in the dining-room to drink and to talk. What they talk of, you will never know. Guests who have been invited for the latter half of the evening join you in the drawing-room.

the gentlemen had supplied the discourse with some variety – the variety of politics, of inclosing land, and breaking horses⁵²

The gravity of exclusively male conversation is hinted at by the fact that fatuous men find it dull. Mr Woodhouse soon wanders into the drawing-room. Mr Weston would rather make advances to Emma, than remain in the dining-room. Frank Churchill confesses that he would rather be with the ladies. In contrast, Mr Knightly is only too happy to discuss such concerns as parish business, politics and agriculture.

Five past six

The room has undergone a transformation. Light is provided by candles on highly ornamented wall sconces, each of which is set in front of a mirror reflecting and enlivening the blaze. These, in turn, flank a large ornate mirror, which hangs above a roaring fire. The fireplace, rather than the window, is the focus of the room. The chairs are arranged in small groups. Take this opportunity to relax, if you can. The chairs are not heavily upholstered and are far from comfortable. It is perhaps for the best that they do not encourage slouching. At Longbourn an improper deportment reflects a slovenly character.

Anxious and uneasy, the period which passed in the drawing-room before the gentlemen came was wearisome and dull to a degree that almost made her uncivil⁵³

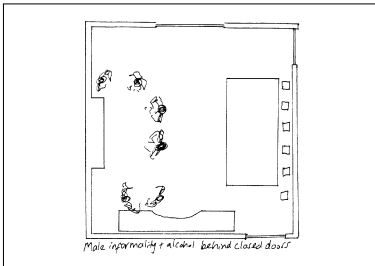
Mrs Norris retorts to Fanny that 'it is a shocking trick for a young person to be always lolling upon a sofa'.⁵⁴ The remark is made in the presence of Lady Bertram, who as a wealthy married woman lolls on the sofa all day long. Female-only conversation can be tedious – Marianne and Eleanor can hardly bear the lengthy discourse at the Dashwoods, on the comparative heights of two children.

Seven o'clock

When the men enter the room, after an hour or so, the daughters Mrs Bennet is most eager to dispose of will serve the tea and coffee. It flaunts their potential as wives and hostesses while allowing all the men present to engage them in conversation, by the simple expedient of refilling their cup. If a gentleman has designs on you, it may well become apparent now. While there are no rules as to who sits where, the fact that the ladies are already seated ensures that the first to enter the room have their choice of companion.

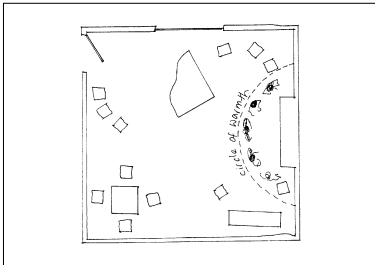
The gentlemen came . . . but alas! the ladies had crowded round the table, where Miss Bennet was making tea and Elizabeth pouring out the coffee, in so close a confederacy that there was not a single vacancy near her which would admit of a chair.⁵⁶

Mrs Bennet keeps servants. Her daughters do not carry out domestic duties. They serve tea as a vehicle for their display. Mrs Bennet ensures that Elizabeth and Jane, as the most marriageable of her daughters, are pouring the tea and coffee when Mr Bingley and Mr Darcy come to dine.



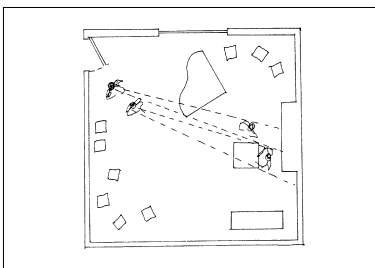
Male conversation is only truly relaxed when servants and women have left the room. The convention of inviting those of a lower rank to arrive only for tea, and to join the women in the drawing-room, ensures that even male guests outside the immediate social class are excluded. The dining-room becomes 'behind the scenes' space, space where the language of the picturesque may be dropped. Land may be spoken of in terms of rents and values. Trade and profits may be discussed. Foreign policy, colonial worries and domestic politics may be broached without recourse to metaphor.

Essay 1



Without a male audience, formality disappears. Rather than appearing at ease in their simple attire, women may huddle round the fire for warmth. Alternatively, they may slouch or lounge, rather than adopting the statuesque poses befitting their classical dress. Informal clusters of chairs have replaced the traditional circular arrangement, eliminating the exertion demanded of group discussion.⁵⁵ This is not, however, a time of unadulterated pleasure. Limited female education constrains the range of conversation. The picturesque values women as objects of their beauty, but renders them effectively redundant without their audience.

Essay 2



When the men enter the room, women undertake a series of ritualized performances, requiring different spatial arrangements. The first is serving the tea, which places one or two women as the focus.⁵⁷ This is both a drawing-room accomplishment and a domestic skill, providing the perfect opportunity to display a young woman's charms. Married or elderly women take up positions on sofas in the shadows, or busy themselves with domestic duties – it is not their place to take a centre-stage position.

Essay 2

Eight o'clock

If you are of a marriageable age you may be asked to sing or play so that you may be openly gazed at and your accomplishments fully admired. During the summer months, when it is still light, take pains to sit in front of the window, so that you might combine with the landscape to produce an irresistible composition. If you are unable, unwilling, or unwanted to perform, or too old or too poor to be considered as marriageable, you may be invited to play at cards. Make sure you can afford to play; it will invariably be for money.

*Miss Bingley . . . soon afterwards got up and walked about the room. Her figure was elegant, and she walked well*⁵⁸

Mary Crawford strums her harp at the Parsonage window. Miss Bingley parades up and down the room to show off her figure. Even Elizabeth Bennet shows an acute awareness of the picture she creates when Darcy's gaze is fixed on her at Netherfield. Of all the Austen heroines, only Emma, secure in her private fortune of thirty thousand pounds, can blithely declare that she never intends to marry.

Nine o'clock

As evening draws in, smaller focal points compete with the fireplace. A candle on the piano aids and illuminates the player. A second candle is placed on the card table. Etiquette permits private conversation, but the Bennets' drawing room is small, and you would be foolish to say what you do not wish to be heard. If you wish to talk in privacy to one of the gentlemen, wait for the dancing and hope that he chooses you as his partner. You will have ample opportunity to charm him while you await your turn. On formal occasions, the leading lady and her partner start the dancing, but at a small gathering such formality is ignored.

*man has the advantage of choice, woman only the power of refusal*⁵⁹

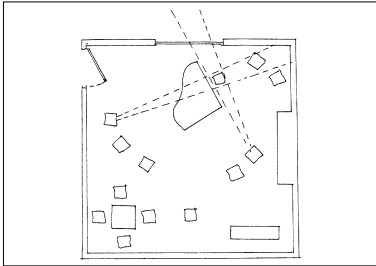
Lucy Steele takes advantage of the noise of the piano to confide in Elinor; Edmund has a private chat with Fanny while the other guests are singing at the piano. Eavesdropping, however, is commonplace. The turbulent relationship between Elizabeth and Darcy begins when she overhears his disparaging comments on her looks. The Bennets' drawing-room is not large, and dancing provides the best opportunity of private conversation.

Ten o'clock

Mrs Bennet will offer you supper. On no account accept. Supper is a rather inelegant meal, and Mrs Bennet displays her vulgarity in continuing to provide it. Besides, it is an informal meal, designed purely to appease hunger, and an appetite is never excusable in a young lady. If you are hungry, you may eat when you go home. If you are tired, do not let it show, unless, that is, your chaperone declares that it is so, in which case you should agree politely, and begin to look a little fatigued.

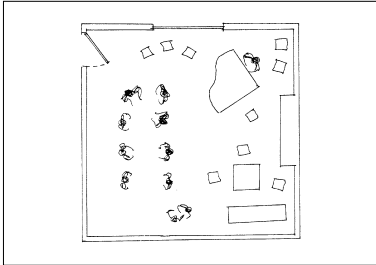
*Victuals and drink! . . . and dost thou imagine that there is no other support for an exalted Mind . . . than the mean and indelicate employment of Eating and Drinking*⁶¹

Elinor and Marianne show an appropriate indifference to the demands of their bodies; Mrs Jennings cannot 'make them choose their own dinners at the inn, nor extort a confession of their preferring salmon to cod, or boiled fowls to veal cutlets'.⁶² Sir Thomas flaunts Fanny's passivity when he decides that she is tired and should go to bed, ensuring that her potential husband is close by to witness her docility.



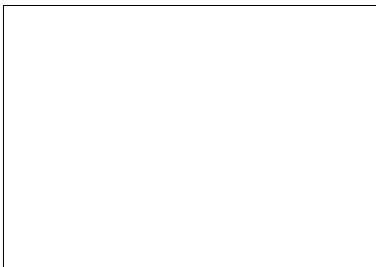
The constraints on a woman's opinions and knowledge demonstrate her position as the viewer of a coherent vision. When conversation ends, she reverts to her role as an object within that vision. Performers are the subject of the male gaze, and situate themselves accordingly. If it is daylight, the window seat with its picturesque background is a prime position. If it is dark outside, candles are arranged to illuminate and aid women strumming at the harp, playing the piano or singing. Women who are not on display stay on their sofas in the shadows, or set up card tables in the periphery of the room.

Essay 2



Having fully admired the female form and accomplishments, men may choose a dancing partner. The popular country dances are in sets, allowing participating couples to chat while they wait to reach the busiest positions as top or bottom couple. They may stand closer together than would be generally acceptable.⁶⁰ Flimsy garments ensure that this is very close. The dance allows for physical contact; the noise of the piano permits private conversation. This is a potentially intimate time. Women may not issue an invitation to dance. An ideal of femininity does not include a will of one's own.

Essay 2



An ideal woman has no preferences, and is equally free from physical desires. Feminine elegance is disconnected from the needs of the body, to the extent that to express even hunger is to shatter the myth. 'Real' women eat at formal meals as a social ritual, but avoid, at all costs, an appearance of greed.⁶¹ While the picturesque woman is on stage she must express indifference to whom she partners for a dance or for life, at least until he has expressed a preference for her. She must feign indifference to the demands of her own body, depriving it of food and warmth. Finally, she must express indifference as to the duration of her performance.

Essay 2

Notes and references

1. According to research outlined in R.W. Chapman in his appendix to *Pride and Prejudice*, Chronology.
2. Page numbers for *Pride and Prejudice*, *Sense and Sensibility*, *Northanger Abbey*, *Mansfield Park*, *Emma* and *Persuasion* refer to *The Works of Jane Austen* published by the Hamlyn Publishing Group Ltd, Middlesex, in 1968. Page numbers for other Jane Austen works refer to *Love and Friendship* [sic] and *Other Early Works* published by Harmony Books in 1981.
3. Alan Liu identifies these phases in *Wordsworth: The Sense of History* (Stanford University Press, 1989). The elusive nature of the concept renders this, and any other, attempt to define its development open to dispute.
4. John Barrell defines the picturesque as 'the transcendent viewing-position which had throughout the eighteenth century been regarded as the perquisite of the gentleman' (quoted by S. Copley and P. Garside on p. 3 of *The Politics of the Picturesque*, S. Copley and P. Garside (eds), Cambridge University Press, 1994) If, however, we are to believe that the development of the picturesque vision was in any way conscious, women, being excluded from public life, are more likely to experience the picturesque as a *transcendent* viewing position. If the picturesque vision is the gentleman's ideal, conscious moves to perpetuate it demand at least a recognition of alternative points of view.
5. Anne Bermingham explores women's self-images in 'The Picturesque, and ready-to-wear femininity' in Copley and Garside *The Politics of the Picturesque*.
6. Mrs Bennet in *Pride and Prejudice*, Ch. 9, p. 207.
7. *Pride and Prejudice*, Ch. 7, p. 202.
8. Raymond Williams points out that 'she [Austen] sees . . . a network of propertied houses and families, and through the holes of this tightly drawn mesh, most actual people are simply not seen.' Raymond Williams, *The Country and the City* (The Hogarth Press, 1993; first published by Chatto and Windus, 1973).
9. Mary Crawford in *Mansfield Park*, Ch. 5, p. 401.
10. Mr Collins in *Pride and Prejudice* Ch. 29, p. 265.
11. *Northanger Abbey*, Ch. 10, p. 886.
12. Edmund Bertram in *Mansfield Park*, Ch. 23, p. 486.
13. Jane Austen's description of Mrs Powlett. Quoted by C. Castle in 'Sister – sister', *London Review of Books*, 17 (1995) 3–6.
14. Uvedale Price: *On the Picturesque*. Quoted by Anne Bermingham in 'The Picturesque and Ready-to-Wear Femininity', on p. 88 of S. Copley and P. Garside (eds), *The Politics of the Picturesque* (Cambridge University Press, 1994).
15. *Sense and Sensibility*, Ch. 29, p. 266.
16. Raymond Williams in *The Country and the City* p. 125, writes: 'they succeeded in creating . . . a rural landscape emptied of rural labour and labourers' . . . from which the facts of production had been banished.'
17. *Pride and Prejudice*, Ch. 29, p. 266.
18. Fanny Burney, in her diary entry of 8 December 1782, writes: 'not one [servant] inquired our names or took any notice of us. We . . . went upstairs . . . No servant followed or preceded us.' The staircase achieves discretion without human presence. Besides, her hostess, Lady Galway, presumably has the luxury of private rooms. Mark

- Girouard, *Life in the English Country House*, p. 238 (Book Club Associates, 1979; first published by Yale University Press, 1978).
19. Mrs Bennet in *Pride and Prejudice*, Ch. 56, p. 385.
 20. Edward Ferrars in *Sense and Sensibility*, Ch. 18, p. 48.
 21. William Gilpin, *Observations Relative Chiefly to Picturesque Beauty* (1772), Quoted by Peter Garside in 'Picturesque Figure and Landscape', on p. 146 of S. Copley and P. Garside (eds), *The Politics of the Picturesque* (Cambridge University Press, 1994).
 22. *Pride and Prejudice*, Ch. 29, p. 265.
 23. Window tax was introduced in 1697, and increased on six different occasions between 1747 and 1808. It was finally reduced in 1825, but not fully repealed until 1851.
 24. Elizabeth Bennet in *Pride and Prejudice*, Ch. 27, p. 262.
 25. Edward Ferrars in *Sense and Sensibility*, Ch. 18, p. 48.
 26. Lydia Bennet in *Pride and Prejudice*, Ch. 51, p. 340.
 27. 'The dining room was now recognised as a masculine room and the drawing room as a feminine room. The two reigned as king and queen over the other rooms.' Mark Girouard, *Life in the English Country House*, p. 233 (Book Club Associates, 1979; first published by Yale University Press, 1978).
 28. Mr Bennet in *Pride and Prejudice*, Ch. 13, p. 216.
 29. *Pride and Prejudice*, Ch. 54, p. 351.
 30. Wilkie Collins, *The Woman in White*, p. 287 (Penguin Popular Classics, 1994; first published in 1868).
 31. An elongated chamber pot for women, which may be slipped discreetly between the legs.
 32. *Pride and Prejudice*, Ch. 51, p. 340.
 33. Miss Stelle in *Sense and Sensibility*, Ch. 38, p. 132.
 34. Wilkie Collins, *The Woman in White*, p. 287 (Penguin Popular Classics, 1994; first published in 1868).
 35. Modern Rumford fires are installed only in the homes of the wealthy. General Tilney has a Rumford at Northanger Abbey.
 36. Mr Woodhouse in *Emma*, Ch. 29, p.734.
 37. Anne Bermingham, *The Picturesque and Ready-to-Wear Femininity*, p. 107.
 38. *Mansfield Park*, Ch. 9, p. 420.
 39. America gained its independence with the Treaty of Paris in 1783.
 40. Mahogany is increasingly to be found in the homes of the impoverished gentry since the repeal of import duties in 1721.
 41. Lady Bertram in *Mansfield Park*, Ch. 31, p. 528.
 42. See Zoe Munby, 'Representations of women and race in the Lancashire common trade', in *A View From the Interior, Feminism, Women and Design* (Women's Press, 1989), p. 20.
 43. *Pride and Prejudice*, Ch. 8, p. 203.
 44. 'So much is the blind Folly of this Age that (people) would rather be impos'd on by a French Booby, than give Encouragement to a good English Cook!' Hannah Glasse, *The Art of Cookery Made Plain and Easy* (1803).
 45. *Emma*, Ch. 42, p. 790.
 46. John Loudon, the landscape architect, published a pamphlet in 1803 entitled *An Immediate and Effectual Mode of Raising the Rental of the Landed Property of England, and Rendering Great Britain Independent of Other Nations for the Supply of Bread Corn*.

47. Mrs Bennet in *Pride and Prejudice*, Ch. 54, p. 353.
48. *Sense and Sensibility*, Ch. 47, p. 172.
49. 'The counter-revolutionary panic of the ruling classes expressed itself in every part of social life.' E.P. Thompson, *The Making of the English Working Class*, p. 194 (Pelican, 1981; first published by Victor Gonzales, 1963).
50. *Pride and Prejudice*, Ch. 53, p. 351.
51. *Sense and Sensibility*, Ch. 21, p. 62.
52. *Sense and Sensibility*, Ch. 34, p. 114.
53. *Pride and Prejudice*, Ch. 54, p. 352.
54. Mrs Norris in *Mansfield Park*, Ch. 7, p. 413.
55. Fanny Burney describes the new taste for informal seating in her diary entry of 8 December 1782: 'Miss Monckton exclaimed "My whole care is to prevent a circle" and hastily rising, she pulled about the chairs, and planted the people in groups, with as dextrous disorder as you would desire to see.' Quoted by Mark Girouard in *Life in the English Country House*, Ch. 8.
56. *Pride and Prejudice*, Ch. 54, p. 352.
57. There is a boast of wealth implied in the tea ceremony. It is subject to heavy taxation, and is so expensive that caddies are often fitted with padlocks. The pouring and serving of tea displays both servility and social eligibility.
58. *Pride and Prejudice*, Ch. 11, p. 213.
59. Henry Tilney in *Northanger Abbey*, Ch. 10, p. 887.
60. 'You can't understand how the characters in *Pride and Prejudice* meet unless you understand how the dances work . . . When you dance in twos, the top couple in the line has to stand out, and they talk and gossip.' Widower Jack Stafford, who met his fiancée through the Janeite Society. *Radio Times*, 15–21 April 1995.
61. Edward quoted in *Love and Friendship*, Letter the Seventh, p. 7.
62. *Sense and Sensibility*, Ch. 26, p. 78.
63. According to the Reverend John Trusler, to eat very much 'is now deemed indelicate in a lady, for her character should be rather divine than sensual.' *The Honours of the Table* (1787).

Tenuous boundaries: women, domesticity and nationhood in 1930s Turkey

Gülsüm Baydar

In the 1930s modern architecture was highly popularised in Turkey mostly through the widespread promotion of the modern house. In the early stages of nation building, the modern house became one of the most potent symbols of the modern nation, which aspired to enter the European economic, cultural and political milieu as an equal partner. The image of the modern Turkish woman played a somewhat similar role, her increasing access to various aspects of the public sphere being highly publicised as the success of Turkish modernisation. Despite obvious links between women and architecture, ranging from their active promotion as suitable images for the new nation to the physical appearance of women in public spaces, issues of gender and sexuality remained conspicuously absent from the architectural historiography of modern Turkey. In this paper, I offer critical readings of contemporaneous representations that relate the modern house and modern Turkish woman to uncover the complicated and contradictory levels that constitute the seemingly coherent narrative of architectural and cultural modernisation. The analysis of the relationship between sexuality, space and architectural discourse effectively complicates the architectural historiography of modern Turkey and shows the active participation of architecture in the production of the social/cultural realm.

... [U]nobtrusively but crucially, a certain metaphor of woman has produced (rather than merely illustrated) a discourse that we are obliged 'historically' to call the discourse of man. ... [T]he discourse of man is in the metaphor of woman.

Gayatri Chakravorty Spivak¹

Preamble

The 1930s marked the most intensive period of modernisation in Turkey. The newly established Kemalist programme was determined to bring the young Republic into the European economic, cultural, and political milieu as an equal partner

and advocated nationalistic idealism and progress through modernisation.² Such reforms as changing the alphabet from Arabic script to Latin, adopting the Swiss Civil Code, and replacing the Ottoman fez with the European-style brimmed cap, signified important steps towards this goal. In the founding years of the Republic, visible symbols of modernity were actively deployed to publicise the image of the new nation state as a radical break from its Islamic Ottoman past. Within this context, both 'modern architecture' and 'the modern Turkish woman' constituted important components of the image repertoire of modern Turkey.

Indeed, modern architecture fitted well into the search for a new architectural expression in the young Republic. The political/cultural demand to break with the Islamic Ottoman past, the active search for a contemporary lifestyle, invitation and employment of European architects and the need for fast and cheap construction are often cited as the reasons for its popularity.³ Modern architecture's main themes of rationalism and functionalism, its emphasis on health and efficiency, and promotion of new aesthetic sensibilities complemented the image of the modern, civilised and secular nation that Turkey aspired to become. As in the West, the modern house occupied the most significant portion of architectural discourse and practice in 1930s Turkey. Its aesthetic vocabulary of simplicity, functionality and rationality formed a desirable contrast to the heavily ornamented eclecticism of late Ottoman architecture.

The image of the modern Turkish woman was promoted somewhat similarly. Her increasing access to various levels of education and appearance in the public sphere as a competent professional created a striking contrast to the image of the veiled Muslim woman relegated to the private domain of domestic interiors. In the political/cultural domain, the recognition of women's suffrage (1934), their acquisition of legal rights to property and the abolition of polygamy (1926) marked significant breaks with the Islamic past.⁴ Women became highly visible agents of the modern project.

Despite obvious links between women and architecture, ranging from the physical appearance of women in public spaces to the active promotion

of their new image, issues of gender and sexuality remained conspicuously absent from the architectural historiography of modern Turkey. In fact, only recent work has begun to reveal the complicated articulation between architectural form, political discourse, aesthetic conviction, ideological expression, cultural debates and nationalist sentiments. Within such a framework, Sibel Bozdoğan demonstrates that the Republican discourse on women in Turkey had a prominent spatial and architectural component.⁵ In her work on Turkish architectural culture in the early Republic, Bozdoğan explains how images of modern women were deployed to exemplify the success of the nation in detaching itself from the Ottoman past and how modern architecture was identified with the new Kemalist woman both symbolically and literally.

Most significantly, recent work in feminist studies has shown that the Kemalist woman is a complicated figure, which cannot be explained away solely by references to progressive aspects of modernisation in Turkey.⁶ Much is now written on how women were seen as agents of nationalist ideologies in the modernist project, rather than as autonomous subjects, who speak in their own right. Such work challenges the hitherto dominant notion that Republican reforms liberated women from the paternalistic order of the Islamic past. To abolish Islam did not automatically mean to abolish paternalism. Such criticism does not imply the wholesale denial of the significance of the Kemalist project however. On the contrary, it marks the continuation rather than rejection of the modernist project in Turkey.⁷ Adopting a similar perspective in architecture shows that the

modern house played an active role not only in producing the pristine image of the modern nation but also the paternalistic mechanisms in its construction.

In what follows, rather than explaining the modern house in Turkey merely as a *product* and *result* of the developments in the political/cultural sphere, I will focus on the agency of architecture in the (re)production of the latter. Critical readings of contemporaneous representations that relate the modern house and modern Turkish woman uncover the complicated and contradictory levels that constitute the seemingly coherent narrative of architectural and cultural modernisation.⁸ In many ways, my examples are typical of their period. Yet they include inadvertent disclosures of the cracks and fissures in the coherence of the dominant fiction, in the manner of the Freudian slip of the tongue.⁹ I capitalise on these slips, which reveal the irreducible role that the figure of the woman plays in the (de)construction of this fiction.

Woman is the house

As I was screening a large collection of articles from popular magazines of 1930s Turkey, two seemingly unrelated bedroom images stood out. The first one appears in an architectural context and illustrates the superior aesthetics of modern furniture. The second one belongs to an article on love and jealousy (Figs. 1 and 2). There is nothing unusual about these topics. Domesticity, marriage, family and women are familiar themes of such magazines and the 1930s marks the widespread promotion of modernist aesthetics in architecture and the visual arts. At first sight, these images can easily be



Figure 1. Illustration of a modern bedroom. 'Yatak Odalarımızı Sade Yapalım' (Let's make our bedrooms simple), *Yedigün* 53 (14 March 1934): p. 13.

dismissed as innocent illustrations of what the texts explicate. However, upon closer inspection, they tell other stories which articulate with their historical context in intriguing and interesting ways.

The first illustration comes from the 'Home and Furniture' section of *Yedigün* (Seven Days), which used to feature modernist house plans, façades and domestic interiors on a weekly basis.¹⁰ The bedroom in question is a typical example. The caption reads:

Figure 2. Illustration of an article on love and jealousy. 'Aşk ve Kıskançlık İçin ne Söylemişler' (What has been said about love and jealousy), *Resimli Ay* 23 (January 1938): pp. 78–9.



How beautiful is the bedroom in the photograph in its simplicity! The low-lying bed and the beauty of the contours of the furniture around do not call for explanation. If you look carefully, you will agree in the manner that beauty goes hand in hand with simplicity. The photograph shows a bright and airy room with typically modernist furniture in sharp rectilinear outlines. If it were not for the figure of a seemingly relaxed woman reading a magazine lying on the bed, it bears the solemnity of an office space. The room is filled with sunlight, every object

belongs to a proper place and the bed looks immaculate. What is striking in the caption is that the adjectives that are used to describe the interior, such as beauty in simplicity and beautiful contours, correspond to those that are used to describe the desirable attributes of the proper modern Turkish woman. In fact, the 'Home and Furniture' sections of *Yedigün* abound with similar phrases like 'simplicity and elegance', 'beauty without extravagance', and 'freedom from unnecessary adornment' to describe modern interiors. The figure of the proper woman seems to have worked as an appropriate metaphor for the modern house.¹¹

The second bedroom, which appeared in *Resimli Ay* (Monthly Illustrated), illustrates a collection of aphorisms on love and jealousy.¹² The photograph caption reads, 'woman's jealousy creates havoc in the house'. Like the first photograph, we have the partial view of a bedroom with a woman lying on the bed. The similarity ends there however. Further comparison involves a series of opposing qualities. In the first photograph every object is assigned a proper place. The walls are bare; the room is airy and spacious. Here we see pillows scattered on the bed, several pictures and a plant pot hanging on the wall with no apparent order, and a pile of small objects thrown on the bedside table. There is no trace of the containment, discipline and order that characterise the first room. Furthermore, unlike the equanimity of the woman in the first photograph, the woman here seems grounded in the bed with uncombed hair and an unsettlingly disturbed facial expression directed at the viewer. When I compare the two images from the point of view of women's

representation in relation to space, the story gets more complicated. The second photograph is meant to illustrate a woman in a state of jealousy – a state which is intimately connected to her sexuality. When her sexuality is out of control, there remains no trace of domestic order.

From this perspective, the contained composure of the woman in the modern bedroom strikes me differently. She is a paradoxical figure, who seems both an inextricable component of the room that she occupies and a total alien at the same time. On one hand, her contained composure, unostentatious outfit and modern looks are in line with the architectural characteristics of the bedroom. In that sense she certainly belongs there, as a perfect illustration of the adjectives that are used to describe the room. On the other hand, being fully dressed with her shoes on, this woman seems to be placed on the bed temporarily, ready to leave after the flash of the camera. She is clearly not engaged in any function that a bedroom calls forth. One may argue that her figure is not even needed to make the point of the article. As opposed to the improper woman who inhabits the improper room in the second image, this one is the proper woman who dis-inhabits the proper bedroom.

These two scenes signal a complicated exchange between women and space, which is governed by notions of propriety and inhabitation. In fact, as feminist theorists have argued, the feminisation of space has a long history with serious ethical implications. Based on diverse examples from different historical and theoretical locations, Sue Best states that the association of space with the feminine, 'speaks of a persistent desire to domesticate space,

to bring it within a human horizon and, most importantly, to "contain" it within this horizon'.¹³ How are notions of domestication and containment mobilised in the historical instant in question? Who decides the proper/improper boundary and on what basis? What is the relationship between the metaphor of woman in relation to the house and women's bodies that inhabit the modern house in the Turkish case?

Man has the house

The architecture of the modern house was widely promoted throughout the 1930s by both the architectural and popular press. In 1931, Celal Esat, one of the most prolific architectural critics of the time, announced the arrival of 'New Architecture' to Turkey in an enthusiastic and jubilant tone.¹⁴ In his book bearing the same title, Celal Esat celebrates the principles of rationalism and functionalism and glorifies the formal opportunities that emerged by the use of new building technologies. In devoting a separate section to the 'new house', he emphasises its significance and suitability for modern life styles. Following a lengthy account of the architectural features of modern buildings, he adds:

Amongst all nations, Turkish architecture attracts particular attention for its rationality and affinity with modern architecture. That is why this new architecture will not look alien to us.¹⁵

At this point, Celal Esat's architectural focus is diffused by nationalist sentiments. Actually, domestic space was hardly confined to the realm of architectural interests in 1930s Turkey. Where almost every component of the cultural sphere was

inscribed by ambitions to Westernise and modernise, the discourse on the modern house was intricately entangled with political and ideological interests. Architecture was a potent pedagogical site where modernist sentiments became highly visible. Architectural agency played an irreducible role in setting up the relationship between the individual citizen and the symbolic space of nationhood. In the euphoric decades of nation building, architectural and urban imagination flowed effortlessly between the notions of nation and building – building and nation building.

One of the most astounding narratives that links the modern house to the space of the nation appeared in *Modern Türkiye Mecmuası* (Journal of Modern Turkey) in an article entitled, 'What is a house and how should a house be set up?'¹⁶ Stating that in Turkey 'the house is an institution and an organisation that now develops to be on par with the civilised level [of the Europeans]', the author introduces an astonishing history of the Turkish nation. According to him, the notion of settlement had been foreign to the Turkish people until the foundation of the Republic, since centuries of Ottoman conquests and defeats prevented the Turks from claiming any piece of land as their own. With the new national borders firmly established, however, the situation changed. The author explains:

The Turkish nation does not have its eyes set on other horizons. At the same time it does not even think of sacrificing an inch of the land that it rules. The Turkish nation has decided to settle permanently on this land, which it will rule forever. That is why iron and concrete

bridges replace wooden ones, stone and concrete houses take the place of adobe constructions. Like many other good things, the Turkish citizen has just become familiar with the notion of home in the Republican period.¹⁷

This unusual narrative of the settlement process of the Turkish people enables the author to move between national and architectural boundaries with alarming ease. As the article continues, the idea is that the modern house is home for the Turkish subject in the same way as national borders mean home for Turkish citizenry. Inhabiting the house and inhabiting the nation are conceived as one. The modern house seems to bear a much bigger burden than its material propriety in terms of conforming to modernist architectural principles. It is the material embodiment of the imaginary link between the spheres of the nation and the individual. In this account, its owner is primarily identified with the figure of the 'Turkish citizen'. Furthermore, this figure is unmistakably sexed as male. Throughout the article, there are a number of references to the house that confirm this point. The author describes it as 'a place to rest when one comes back from work at night', and refers to the 'owner's study room' and 'study table'. The woman in the house, on the other hand, is explicitly referred to as the 'house-wife', with no apparent relation to the realm of the workplace. In fact man's ownership of the house was already institutionalised by the 1926 Civil Code, which states that the husband is not only the head of the family and the representative of the marriage union, but also holds the privilege of choosing the place of residence for the family.¹⁸

How then does this masculine figure occupy the house? In 'What is a house and how should a house be set up?' another figure, identified as 'the European', sets the standards. The author says, 'when a *European* couple sets out to build a house, the first thing they think about is their comfort'. Later on he continues to explain, 'for the *European*, the house is something private, belonging to the individual' (emphases mine).¹⁹ Throughout the article, the figure of the anonymous European haunts every notion of the modern house. *S/he* seems to be an idealised subject without a particular nationality, class and gender, who inhabits the ideal modern house. The author goes on to explain that a person who furnishes a modern house 'can be proud of it and show it to a foreigner without any embarrassment'. What strikes me here is the introduction of the figure of the foreigner. Those who are invited to see one's house, are commonly called guests rather than foreigners. The former term resonates with a tone of intimacy and familiarity that is hardly associated with the figure of a foreigner.²⁰ Furthermore, in the Turkish language, the term foreigner denotes a foreign national as well as an unfamiliar person. Hence the two figures, the European and the foreigner, who are introduced as the outsiders to the modern Turkish house, can be easily juxtaposed.

The architecture of the modern house with its large glass surfaces is intricately intertwined with this scenario of exhibitionism and voyeurism. Three photographs in 'What is a house and how should a house be set up?' clarify this point. The first one, captioned, 'a beautiful bird cage in a modern house', shows an undecorated but fully equipped

and very ordinary birdcage hanging inside the circular frame of a tubular metal stand, complete with a bird (Fig. 3). Initially I was amused to see this trivial object right next to the bold fonts of the article's title. Although references to undecorated and functional furniture such as living or dining room sets, cupboards and beds are abundant in the discourse on the modern Turkish house, a birdcage should hardly be an object worthy of architectural deliberation. Considered in relation to the



Figure 3. Illustration of a bird cage in an article on the modern house. 'Ev Nedir ve Bir Ev Nasıl Kurulmalı?' [What is a house and how should a house be set up?], *Modern Türkiye Mecmuası*, 2 (1938): p. 16.

second illustration, however, it takes on a significant meaning. This is a photograph of a curvilinear façade rendered transparent by the use of large windows with thin frames (Fig. 4, bottom). It looked like quite an ordinary modern façade to me until I connected the two images. Indeed, the façade seemed to replicate the birdcage in gigantic proportions. The third photograph, an interior view, further accentuates this similarity (Fig. 4, top). The caption reads: 'A hall that has a view to the

garden through its large display-window.' In its common use, the term display-window hardly applies to the architecture of the house, as it structures the gaze from the outside in. In this case its use makes total sense, however, in view of the statement that the interior is offered to the gaze of the foreigner. The architecture of the house structures the relationship between the foreign spectator and the occupant. Here, the transparent façade produces the modern Turkish citizen and the foreigner similarly to the birdcage, which produces the bird as an object and its viewer as the gaze.

Following this logic, as the metaphor of national borders and under the imaginary gaze of the foreigner, the tenuous boundaries of the modern Turkish house need to be under permanent control. However, this unhomey image is effectively and conveniently dispelled when the author states:

A modern house is an open arm that answers every need of its owner. It is a heavenly corner where his eyes meet beauty, his ears receive quietude, and his body receives comfort.²¹

The feminised discourse of the modern interior that I mentioned earlier is further accentuated here. The modern house not only is simple, beautiful and unostentatious, but also offers quietude, comfort and care. It is doubly feminised, both by analogy to the woman's desirable appearance and to her naturalised maternal capacity to love and nurture. In order for man to have the house, woman has to be the house. In other words, she needs to be the site of support for man's ownership and control.²² It seems like the modern Turkish house has no room for the woman as a speaking subject.

Figure 4. Interior and façade of a modern house. 'Ev Nedir ve Bir Ev Nasıl Kurulmalı?' [What is a house and how should a house be set up?], *Modern Türkiye Mecmuası*, 2 (1938): p. 17.



Then what kind of inclusions and exclusions operate to cover up this repression in a newly founded modern nation where women's rights occupy a considerable portion of the cultural/political agenda? What kind of feminine identification is constructed in relation to the house? Who is the modern woman who inhabits the modern house in modern Turkey? To answer these questions it is necessary to turn from the feminised metaphor of the house to the body of the woman in the house.

Woman in the house

Women's increasing access to the public realm in education, professional employment and entertainment featured prominently in the popular press of the 1930s. Many of Kemal Atatürk's speeches and numerous contemporaneous publications actively promoted the image of the modern Turkish woman. At first sight, the celebration of her public image as an educated professional and her simultaneous identification with the nurturing image of domesticity seem paradoxical.²³ However, this paradox is powerfully covered under the masculinist discourse of nationalism.

One of Atatürk's passionate speeches of 1925 is a paradigmatic example of the underlying tone of this discourse. Addressing a mixed crowd of men and women, the founder of the Republic says:

Friends . . . *our* women, like *us* are intelligent and thoughtful people. Once we inject them with consecrated morality, explain them *our* national moral values and adorn their brains with enlightenment and purity, there is no need for selfishness. Let them show their faces to the world. And let them see the world with

the careful attention of their own eyes. There is nothing to fear in this.²⁴ (Emphases mine.) If fear seems a strange notion to introduce at this junction, it is perhaps the most appropriate one to highlight the fissures in the theoretical premises that link domesticity, women and nationhood. As feminist theorists have argued, the feminine figure plays a double-sided role in masculinist discourses. On one hand, she represents a docile and familiar entity to be dominated. On the other hand, she is the signifier of precarious boundaries and hence the source of anxiety and fear.²⁵ Atatürk's speech is an astoundingly clear demonstration of the role of the feminine figure in the masculinist discourse of nationalism. Furthermore, the *us* versus *them* mentality in his speech leaves no doubt about the gender hierarchies that are preserved in the new discourse on women's rights. The potentially unruly woman is allowed to have a public face only after being re-formed by men. She needs to be tamed by men's national and moral values in order not pose any threat. Her relationship to these values is explained in another speech by Atatürk:

What should a Turkish woman be like? The Turkish woman should be the most enlightened the most virtuous and the most dignified woman in the world. . . . The duty of the Turkish woman is to raise future generations with the necessary vigour to protect and defend the Turkish nation with intelligence, wisdom, strength and determination.²⁶ This is not an isolated instance whereby maternal qualities of women take centre stage for the higher good of the nation. Such accounts reinforce the dominant nationalist discourse, which is based on

masculine attributes of domination and control. The fantasy of woman as enlightened mother sustains the scenario of the coherent modern nation. This point is made explicit by the popular press as well. In one of the most telling instances in 1937, the editorial of the inaugural issue of *Ev-İş* (Home-Work), states that the house provides the support for the Republican revolution and Turkish society.²⁷

The metaphorical exchange that is established between the nation, the modern house and the Turkish woman is materialised in actual political and cultural practices. Notions of boundary and control re-enter the scenario in relation to women's bodies. The latter is an obsessive theme of the popular journals of the 1930s, prominently featured not only in fashion and beauty sections but also in articles on sports, health and social life. Detailed explanations of the importance of sports and exercise almost exclusively illustrate only women's bodies. They emphasise precision and perfection in the movements and the measurements of the body. An article on a girl's youth camp describes young women in bathing suits as 'healthy, tanned, robust girls, each looking like a statue of health'.²⁸ Articles on adolescent health describe proper measures in dealing with high-school girls' bodily and emotional disorders.²⁹ These magazines enthusiastically publicise the trade schools that are established in major cities to educate women on proper 'scientific' conduct of housework, sewing and gardening. Such institutions produce the efficient women of the efficient modern house. Remarkably, the authors of almost all these articles are men. As one contemporary theorist put it, 'men gave social birth

to the new woman of the Republic.'³⁰ Women's bodies are sites of discipline, control and regulation. Their contours need to be carefully delineated to overcome lack and to guard against excess.

This point is clearly explicated in 1938, by the renowned author and journalist Peyami Safa who offers a concise summary of the idealised woman in the dominant fiction of modern Turkey by identifying four types.³¹ The first type, according to him, is the aggressive, intolerably independent and vocal feminist-socialist woman with unmistakably masculine attributes. She is neither modern, nor Turkish, nor woman. The second type is the spoilt, degenerate bourgeois, who consumes her time in beauty parlours, shops, ballrooms and exhibition halls. The gossipy housewife is the third type. With no interest outside the narrow circuit of her neighbourhood events, she is unimaginative, ignorant and boring. These figures bear the mark of lack (of knowledge, national qualities and womanhood) or excess (of independence, language, publicity). The last type is the *real* modern Turkish woman. The author explains:

As it applies to all women from time immemorial to eternity, the headquarters of the modern Turkish woman is her house. But all the virtues, attractions and excitement of nature and society will flow inside this house by means of fresh air, sunlight, books, radio, etc. . . . The modern Turkish woman differs from her predecessors . . . by being an enlightened woman and mother who carries out her domestic and parental duties with love, knowledge and technical skills, besides having some understanding of world events.

So long as she sticks to this principle, every step that she takes, even if it leads to masculine tasks, will be beneficial to her. So long as she sticks to this principle, her love for toiletry and sports will improve her health and beauty.³²

This is a remarkable statement that conjoins the nation, the architecture of the modern house and woman in one breath. Fresh air and sunlight, the essential qualities of the modern house bring the outside world in. However, it turns out that this is only to enlighten the woman in the house so that she can conduct her domestic and maternal duties with knowledge and precision.

All of these examples illustrate that the modern Turkish woman was formed by her subjection to the nationalist symbolic realm of domination and control. Not surprisingly then, she is only heard when she speaks the language which 'others' herself, i.e. the masculinist language of nationalism. This is not to overlook the fact that in some cases, the latter worked efficiently to benefit women's participation in the public realm. For example, the activities of the most prominent women's organisation, Turkish Women's Association (Türk Kadınlar Birliği) were instrumental in the recognition of women's suffrage.³³ On the other hand, when numerous journal articles of the 1930s featured individual women who worked outside their homes in various trades and professions, their emphasis remained almost exclusively on these women's altruism. They are proudly portrayed either as sacrificing family life for the good of the nation or selflessly generating income to support their families. Typical examples include a newly

appointed member of the parliament who is quoted as saying that she does not live for herself but for her nation, and a young fruit-seller who takes care of her mother, who is introduced as 'a real lady; a conscientious Turkish woman who earns her life under demanding conditions'.³⁴ The working woman presents an acceptable image to the extent that she is self-less.

The glorification of domestic life, on the other hand, is strikingly highlighted by the title of one article, 'Let professional life be yours, I am contented with my new house', which is authored by a woman who resigned from her job to dedicate herself to her house, family and children.³⁵ Women's responsibilities at home were further emphasised by the programmes of women's organisations, which were mostly confined to educating them in areas pertaining to domestic work. Interestingly, in 1935 a newly appointed woman representative in the parliament declared that she did not intend to represent women's issues. According to her, as Turkish women had obtained all the rights that had been previously denied to them, there was no need for women's organisations anymore.³⁶ The complicated and often unsettling aspects of the relationship between the new woman, the public sphere and the domestic realm were powerfully hidden by the success of the administrative and legal reforms, which enabled women's unprecedented appearance in areas previously confined to men. Discourses on the modern Turkish woman and the architecture of the modern house silently participated in the production of the masculinist practices of the young Republic.

Conclusion

In 1930s Turkey, nationalist and modernist discourses intricately articulated the representation of women in relation to space. The public space of nationhood, the privacy of the house and the feminine figure intertwined in complicated ways. Metaphors abound. The boundaries of women's bodies and the feminine sphere, architectural boundaries and national borders are superimposed. Boundaries are sites of encounter between the self and the other. As such, they are sites of potential threat to be controlled and guarded against invasion. In the architectural and cultural instances on which I have focused, the feminine figure always appears as the metaphor for the disorderly element that threatens the dominant fiction, which produces the nation. As Geraldine Heng and Janadas Devan have argued in another context, 'women, and all signs of the feminine, are by definition always and already anti-national.'³⁷

In the early years of the Republic, discourses on the modern house and the modern Turkish woman are juxtaposed at a number of levels to aid the production of the masculine realm of nationhood. First of all, the modern house is seen as the microcosm of the space of the nation. As such, it is owned and guarded by man. It is the metaphor of a space that men protect against foreigners. At this level, the woman in the house literally nurtures the heroic masculine figure, which is associated with the nation. Secondly, the metaphorical identification of woman with the house reveals the masculine desire of regulation and control. Both the modern house and the modern Turkish woman are desired to be highly visible with similar characteristics of

beauty and elegance without extravagance. Woman is effectively stripped of her sexualised agency, which is always already in excess of the nationalist agenda of modern Turkey.

The boundaries of the modern house, which are rendered analogous to national borders, need to regulate feminine sexuality and display the figure of the proper woman to the modernist gaze. The modern house, like the birdcage, traps and domesticates the feminine element and puts her on display. Architectural representations of the modern house in Turkey implicitly participate in the production of the modern Turkish woman. The discordant image of the fully dressed modern woman lying on the modern bed, with which I began this article, is a striking illustration of the repression that is involved in the production of the proper Turkish woman by the nationalist discourse of modernism. The masculinist discourse, which produced nationalism, simultaneously produced the modern house as the proper place of the modern Turkish woman. Yet the image in question is a subtle reminder that she is perhaps not quite at home in her proper place.

Recent feminist work on early Republican Turkey, which reveals women's complicated relationship to nationhood, also enables fresh perspectives to understand the relationship between sexuality, space and architectural discourse. Women's bodies and the architecture of the house are mutually inscribed in the production of the space of the nation. The analysis of the architectural mechanisms that produced and reinforced the proper image of the modern Turkish woman both effectively complicates the architectural historiography

of Modern Turkey and shows the active participation of architecture in the production of the social/cultural realm. In terms of the relation between women and space, the Kemalist project of modernity consists of complicated and contradictory levels, the unpacking of which enables critical positions beyond its sanctified acceptance and wholesale denial.

Notes and references

I would like to thank Hilde Heynen and Lieven De Cauter for their helpful and valuable comments in the development of this paper. They helped me to understand and contextualise my architectural interpretations in both social/historical and also intimately personal terms as a granddaughter of the Kemalist revolution.

1. Gayatri Chakravorty Spivak, 'Displacement and the discourse of woman' in *Displacement: Derrida and After* (Bloomington, Indiana University Press, 1983), p. 169.
2. The term Kemalist refers to Kemal Atatürk, the founder of the Turkish Republic in 1923.
3. For an extensive explanation see, Afife Batur, 'To be modern: search for a republican architecture' in Renata Holod and Ahmet Evin (eds.), *Modern Turkish Architecture* (Philadelphia, University of Pennsylvania Press, 1984), pp. 68–93.
4. For a critical account of the period see, Yeşim Arat, 'The project of modernity and women in Turkey' in Sibel Bozdoğan and Reşat Kasaba (eds.), *Rethinking Modernity and National Identity in Turkey* (Seattle, University of Washington Press, 1997), pp. 95–112.
5. Sibel Bozdoğan, *Modernism and Nation Building: Turkish Architectural Culture in the Early Republic* (Seattle, University of Washington Press, 2001).
6. While Bozdoğan too acknowledges this point, her emphasis remains on the progressive aspects of the reforms.
7. Yeşim Arat states that, 'the emergence of feminism attests to the vigor of the modernist project. The project continues as it is liberated from the monopoly of Kemalist discourse and regenerated by a plurality of voices, including feminisms critical of Kemalist modernism.' Yeşim Arat, 'The project of modernity and women in Turkey' in Sibel Bozdoğan and Reşat Kasaba (eds.), *Rethinking Modernity and National Identity in Turkey* (Seattle, University of Washington Press, 1997), p. 96.
8. In what follows I focus solely on urban architecture. The promotion of modern architecture in rural areas in relation to the status of rural women is a significant topic yet to be researched. However, the Republican reforms remained a remote ideal for the vast majority of rural women. See, Deniz Kandiyoti, 'Gendering the modern' in Bozdoğan and Kasaba, *Rethinking Modernity*, op. cit., p. 125.
9. I borrow the term 'dominant fiction' from Kaja Silverman, which is what passes for reality in a given society. See Kaja Silverman, *The Threshold of the Visible World* (London, Routledge, 1996), p. 178.
10. 'Yatak Odalarımızı Sade Yapalım' (Let's make our bedrooms simple), *Yedigün* 53 (14 March 1934): 13. *Yedigün* was a richly illustrated weekly journal, which included a broad range of articles including politics, sports, childrearing, literature, fashion and architecture. Like other popular journals that I cite below, its aim was to educate the public along Republican ideals.
11. The correspondence of terms that describe modern architecture and modern woman is also mentioned in Bozdoğan, *Modernism and Nation Building*, op. cit., p. 80.

12. 'Aşk ve Kıskançlık İçin ne Söylemişler' (What has been said about love and jealousy), *Resimli Ay* 23 (January 1938): pp. 78–9. In terms of its editorial intentions *Resimli Ay* was similar to *Yedigün*. It was a monthly publication, with particular focus on literary topics.
13. Sue Best, 'Sexualizing space' in Elizabeth Grosz and Elspeth Probyn, (eds.), *Sexy Bodies* (London, Routledge, 1995), p. 183.
14. Celal Esat, *Yeni Mimar* (Istanbul, Agah Sabri Kitaphanesi, 1931).
15. *Ibid.*, pp. 8–9.
16. 'Ev Nedir ve Bir Ev Nasıl Kurulmalı?' [What is a house and how should a house be set up?], *Modern Türkiye Mecmuası*, 2 (1938): pp. 16–17. Although the article bears no signature, both its tone and vocabulary strongly suggest that it is written by an architect. Since the majority of the architects and almost all of those who wrote on architecture at that time were male, I will use 'he' to refer to the author. Although the journal often featured architectural topics, it included a broad range of articles on almost all aspects of everyday life in Republican Turkey.
17. *Ibid.*, p. 16.
18. Yeşim Arat, 'The project of modernity and women in Turkey' *op. cit.*, p. 105.
19. *Ibid.*, p. 16.
20. Furthermore, 'the guestroom' has a long tradition in middle and upper middle class houses in Turkey. It is the room that contains the most valuable furnishings and is only used upon the arrival of guests. In fact 'What is a house and how should a house be set up?' begins by criticising that Turkish families think of the guestroom before their own comfort when they set up a house, as their priority is 'to show off to friends and acquaintances.' As Turkish architectural discourse and practice of the 1930s indicate, there had been a considerable change in the architecture of the modern house in relation to the guest. Emphasising that modern living had externalised many activities, such as large gatherings and work-related meetings that previously took place at home, one architect stated that 'the guest room is an unnecessary luxury for our present needs'. (Abdullah Ziya, 'Binanın İçinde Mimar' (The Architect in the Building), *Mimar* 1 (1931): p. 15.
21. *Ibid.*, p. 17.
22. This interpretation draws from the psychoanalytic account of man 'having' versus woman 'being' the phallus. For an extensive explanation, see Judith Butler, *Gender Trouble* (New York, Routledge, 1990), pp. 43–47.
23. Sibel Bozdoğan draws attention to this paradox in *Modernism and Nation Building*, *op. cit.*, p. 197. Here I am interested in the mechanisms that suppress it.
24. Speech given in İnebolu on 28 August 1925, published in M. Rauf İnan, *Atatürk ve Türk Kadını* (Atatürk and the Turkish Woman) (İstanbul, Arkin Kitabevi, 1991), p. 52.
25. This point is elaborated in Sue Best, 'Sexualizing space' *op. cit.*, p. 183.
26. Speech given on 14 October 1925, at Women's School of Education in İzmir. *Atatürk ve Türk Kadını*, *op. cit.*, pp. 54–5.
27. Quoted in Ayşe Durakbaşa, 'Cumhuriyet Döneminde Modern Kadın ve Erkek Kimliklerinin Oluşumu: Kemalist Kadın Kimliği ve "Münever Erkekler"' [The formation of identities of modern women and men in the Republican period: the identity of the Kemalist woman and 'enlightened men'] in Ayşe B. Hacımirzaoğlu, (ed.), *75 Yılda Kadınlar ve Erkekler* [Women and Men in 75 Years] (İstanbul, Tarih Vakfı, 1998), p. 46. For the emphasis on the maternal qualities of modern Turkish women in the nationalist discourse also see: Yeşim Arat, 'The project of modernity and women in Turkey' and Deniz

- Kandıyoti, 'Gendering the modern' *op. cit.*, pp. 95–112, 113–132.
28. Hikmet Feridun, 'Erkeklerle Yasak Olan Bir Yer: Genç Kızlar Kampı' (A forbidden place for men: youth camp for girls) *Yedigün* 6/131 (11 September 1935): pp. 14–15.
 29. 'Liseli Kızlarımızın Sıhhati' (The health of our high-school girls), *Muhit*, 4/38 (December 1931): pp. 52–3. The anonymous author states that he summarises the views of a doctor published in *Good Housekeeping*. 'Genç Kızlarımıza Takayyütler' (Precautionary measures for our young girls), *Muhit*, 3/31 (May 1931): pp. 44–5.
 30. Deniz Kandıyoti, 'Gendering the Modern' in Bozdoğan and Kasaba, *Rethinking Modernity*, *op. cit.*, p. 123. Ayşe Durakbaşa draws attention to the fact that 'women's issues' had been predominantly addressed by men since the Westernisation period in the Ottoman Empire in the early nineteenth century. See, 'Cumhuriyet Döneminde Modern Kadın ve Erkek Kimliklerinin Oluşumu: Kemalist Kadın Kimliği ve "Münevver Erkekler"' [The formation of identities of modern women and men in the Republican period: The identity of the Kemalist woman and 'enlightened men'] in Ayşe B. Hacımirzaoğlu, (ed.), *75 Yılda Kadınlar ve Erkekler* [Women and Men in 75 Years] *op. cit.*, p. 37.
 31. Peyami Safa, 'Modern Türk Kızı,' *Modern Türkiye Mecmuası* 1/1 (March 1938): p. 4; 1/2 (March 1938): p. 5; 1/4 (March 1938): p. 5; 1/6 (April 1938): p. 9.
 32. *Ibid.*, 1/6 (April 1938): p. 9. In 1937, Peyami Safa had a debate with another intellectual, İsmail Hakkı Baltacıoğlu. The latter was of the opinion that all housework and childcare could be overtaken by machines and social institutions. Interestingly, while promoting the professional modern woman, Baltacıoğlu still argued that, 'the new woman is one with a positive mind to educate her children and to deserve lifelong companionship of men'. See, Duygu Köksal, '1930'lar ve 40'larda Kadın, Cinsiyet ve Ulus' [Woman, Sexuality and Nationhood in the 1930s and 40s], *Toplumsal Tarih* 51 (March 1998), pp. 31–5.
 33. When the Peoples Party of Women (Kadınlar Halk Fırkası) was not recognised by the government because of the political implications of the term party, it was re-founded under the name Turkish Women's Association (Türk Kadınlar Birliği). Interestingly, the former insisted on its non-political aims, stating that the primary duties of women consisted of motherhood, and family affairs. (Zafer Toprak, 'Kadınlar Halk Fırkası' (Women's People Party), *Tarih ve Toplum* 9/51 (March 1988): p. 158). Both the Party and the Association placed primary emphasis on educating women along the lines of Republican ideals of civilisation and progress. Ironically, the Association actively promoted women's political agency besides organising a variety of skills-related courses ranging from driving to sewing. (Leyla Kaplan, *Cemiyetlerde ve Siyasi Teşkilatlarda Türk Kadını: 1908–1960* [Turkish Women in Societies and Political Organisations] (Ankara, Atatürk Kültür, Dil ve Tarih Yüksek Kurumu, 1998), p. 141). Women got the right to political representation in municipal governments in 1930 and in the parliament in 1934.
 34. Musa, 'Saylav Fakihe Bursa Muhabirimize Hayatını Anlatıyor' [Member of Parliament Fakihe tells her life story to our Bursa correspondent], *Yedigün*, 4/104 (6 March 1935): p. 13; Mekki Sait, 'Zarzavatçı Fatma Hanım' [Fruit-seller Ms. Fatma], *Yedigün*, 3/44 (10 January 1934): p. 11. Fatmagül Berktaş points out that the proper women of the early Republic were portrayed either as de-sexualised public figures or as mothers of the family and the nation. 'Cumhuriyetin 75 Yıllık Serüvenine Kadınlar Açısından Bakmak', [Looking at the 75 year adventures of the Republic

- from women's perspective] in Haçımırzaoğlu, (ed.), *75 Yılda Kadınlar ve Erkekler*, *op. cit.*, p. 3.
35. Müfide Muzaffer, 'Memuriyet Sizin Olsun!. Yeni Kavuştuğum Evim Bana Yeter,' *Muhit*, 4/46 (1932), pp. 36–7. Also cited in Bozdoğan, 'Living modern' *op. cit.*, p. 317. I thank Sibel Bozdoğan for making this article available to me.
36. 'Saylav Türkan' *Yedigün*, 4/103 (27 February 1935): p. 15.
37. Geraldine Heng and Janadas Devan, 'State Fatherhood: the politics of nationalism, sexuality, and race in Singapore' in *Nationalisms and Sexualities*, Andrew Parker, Mary Russo *et al.* (eds.), (New York, Routledge, 1991), p. 356.

The meanings of domesticity

Bart Verschaffel

The house is more than a place: the 'domus' is the principle of an order and a device for articulating differences and meanings one lives by. In many cultures domesticity – centrality, stability, continuity – is identified with woman. Yet, linking femininity and domesticity or house can only be reductive when one presupposes that the meaning of the house is simple – nothing more than 'place' and 'centre'. In this article I argue, mainly on the basis of seventeenth century Dutch interior paintings, that the pre-modern experience of the space of the house includes the awareness of 'counterforces' to the hearth-making. The female figure is as ambiguous as the house is, and incorporates as well that counter-force and openness that can save one from the suffocating house.

I don't know how to get out of that which doesn't exist, my dear souls! The word inhabits us and inhabits everything to the point where one doesn't see how one can abstain from the imaginary which leaves nothing intact

Paul Valéry

What makes a house a home? What does domesticity mean for those who live too late to experience fully what 'dwelling' really is (Heidegger)? What does domesticity mean for adults who have to *remember* home, who have to become again the child they carry within, because only children can fully know how a house is a beginning?

What is a house? In the pre-modern world, people and things have their place. Traditional societies devote much time and attention to creating a worldview, to defining the identity of people and objects through assigning them their place. One *is* one's place. Societies then develop strategies to fix and keep things, people, animals at their place or keep the world in order. We think of the

pre-modern world as static and stable, as a world made of 'strong identities' and 'strong meanings'. Pre-modern architecture gets its meaning and importance to a large extent from its contribution to this making of places. A house is a place where people and things can be at home, where they belong, where they are at their place. A monument always participates to some degree in the dwelling, and assigns life its place – even the grave does. Also, every house participates to some degree in the monumental by measuring the human to the world.

A house is more than a place: the *domus* is the principle of an order, it is a device for separating and bringing together animals and humans, the dead and the living, the feelings and gestures of the night and those of the day, meals and digestion, man, woman, children, etc. The house is a device for articulating differences and defining a hierarchy in the meanings one lives by. The house is the place where order is protected and restored

when things start wandering around or haphazardly mix, without rules. It is a place that is 'cleaned' every day, where 'symbolic labour' is done in clearing away the mess and the dirt so that everything can start anew and life can go on, so that life is passed on to the next day.

Domesticity is in many cultures identified with woman. 'Huyselyckheid is 't vrouwen kroon cieraad': 'Domesticity is a Woman's crowning ornament'.¹ Domesticity implies centrality, stability, continuity, fixity, caring for the basics, and all this is related to femininity. In many pre-modern societies, woman's place is at home and in the house. The house is the proper place for the pre-modern, female labour: work that is done neither for profit and growth, nor for developing or inventing the new, but that essentially aims at making life possible and at passing it on. The house is *domus*. There is the work that transforms the harvest into food and supplies, work that renews house and clothes, the work of birth. In the bourgeois era the domestic substance is hidden behind a façade and a salon, the housewife becomes a semi-public figure with representative functions and a life of leisure. The pre-modern domesticity is repressed but it survives, hidden away in the kitchen, the basement, or in the back of the house. It even survives modernity – until today.

What happens to femininity when it is linked to domesticity? At first, femininity seems reduced: linking woman and house could be a means to simplify and control the feminine, out of fear or for whatever reason. Because, indeed, she does not stand just for home and hearth and Ithaca, woman is not just the name for what drives homewards,

what brings movement and history to a stop, to rest and peace. Woman also lures into the woods and the sea and the night, she invites to danger and death. Woman also embodies the Virtues, even Truth. The meaning of 'femininity' is very complex, more than 'masculinity' for sure, and nobody, neither man nor woman, can relate to the feminine simply. Does the house dominate femininity? Is woman put in her place there? Linking femininity and domesticity or house can only come down to a simplification and limitation when one presupposes that the house is simple, and that domesticity is simple – that it is nothing more than 'place' and 'centre'.

Is the house what it seems to be: hearth, home, microcosm? The old, pre-modern world, a landscape of monuments and houses, seems to be a world made of centred and fixed meanings. In the modern conception, it is modernity – the big city and metropolitan life – that slowly undoes this old world and makes everything 'melt into thin air' (Berman). Modernity introduces exchange, movement and transport, change and openness, it induces the globalisation that weakens identity and deconstructs the home. People who live the largest part of their lives in a-topia, who work, communicate and socialise virtually, become automatically those 'nomadic subjects' who at every moment can (re)define their position and belong nowhere – except exactly in that permanent 'in-transit-condition'. This idea of modernity as an almost heroic, rather violent, forced liberation from the closure and fixity of the old world negates, however, the tensions and ambiguities within the old pre-modern conceptions of space and place. There is

more to the house than this logic and force that centralises and fixes. More than anything else the house is a space where two equally powerful forces interact, limit each other and create some kind of a balance. This complexity of the meaning of house does not derive from a deconstruction of its centrality, fixity, or safety, by which the familiar then turns strange, the home 'uncanny', or the house 'umheimlich'. Of course, every meaning is a fragile construction, of course no identity is 'full' or saturated. My argument, however, is different: it points to a complexity that is included *in* the representation – in the construction of the meaning – of 'house' and 'home' itself, rather than being an effect of its de-construction.

An article by the historian Jean-Pierre Vernant on the notion of space in classical Greece illustrates my point.² When the sculptor Phidias represents the Greek pantheon with the statue of Zeus in Olympia, he represents the goddess Hestia and Hermes as a couple, although the gods are not linked by kinship, nor through common mythical adventures or deeds. They belong together – so writes Vernant – 'functionally': because they represent two complementary basic forces or principles in the structuring of the human world. Hestia and Hermes are praised in one and the same hymn, both are considered to be 'friends of the mortals'. Hestia is the goddess of the hearth, of the fire, the centre, of house and home – she stands for fixity, immobility – she is therefore not one of the Olympic gods. She lives among the humans, and precisely because she is always 'home', she lives no adventures, makes no experiences, inspires no stories. Hermes, on the other hand, is always on the move.

He stands for movement, change, exchange, communication. He is invoked at gates, thresholds, at crossroads and bridges, in public places. Hermes is the god of businessmen and thieves, he is the postman, the messenger. *Hermes Angelos*.

The Greeks knew that one cannot pray to one and the same god for safety and protection of hearth and home and to invoke good luck for business and favourable winds for the journey. These are different things, different directions. Certainly, the world is founded, made by a force that centres and accumulates meaning, that attracts, protects – makes a place that is a goal and an end. Humans have to 'arrive' sometimes, they need to go to a place where life somehow comes to a rest. But this force that makes nests, this centralising force that holds fast needs to be balanced by another principle, by something that gives reasons and strength to leave, to go out, to get away. So Hermes, who guards over doors and windows and crossroads, Hermes who opens every lock and every chain, does not deconstruct Hestia, but limits Hestia. A house, therefore, is not just hearth, it is also door and window and threshold. A house that is nothing but centre and place goes insane.

A page from Michel Serres' book *Atlas* provides a second reference and illustration for my argument.³ Serres tries to formulate what it is that turns space into place: into a site that carries a name. What is it that makes a place, an 'ici'? Places are made from some spatial singularity (a tree, the riverside, a well . . .) as it mingles with lives – with the singularity of human existences and activities – with artefacts, trash, smell or corpse. These places, made of time, are the answers to the basic

Figure 1. Pieter de Hooch, *Woman and child in an interior*, c. 1658 (Rijksmuseum, Amsterdam).



Figure 2. Pieter de Hooch, *Woman lacing her bodice*, c. 1661 (Staatliche Museen, Berlin).



questions. Questions like 'Where are you going? where do you come from? where do you pass by?' The answer is always a place and a name: 'I am going there, I come from where I belong, I pass by here.' The world is made of places. But Serres opposes immediately place and 'here' to the road. The road contradicts place and home: 'the road disturbs the *genius loci*, the road goes straight.' So the real answer to the basic questions is never a place, but 'somewhere, elsewhere', 'further, to the land of milk and honey'. 'Where do you come from? I have lost the paradise of "origin", the place I come from was itself already traversed by a road coming from far . . .'

The argument that the meaning of house or the notion of domesticity is complex in itself implies that the meaning of femininity cannot easily be simplified or controlled through linking it to the house. I will illustrate my argument by images taken from the Dutch tradition of interior painting since Pieter de Hooch (Figs. 1 and 2). In these paintings the duplicity and tension that structures the space of the house is made visible through the female figure: sometimes woman is related to opposite dimensions of the house, sometimes she embodies a counter-force to 'Hestia'. For a long time the images of seventeenth century Holland interior painting were considered as realistic representations of peaceful life in the bourgeois homes and towns of Holland. Later, after recognising motives taken from emblem books or from *Father Cats*, they were seen as moralising pictures representing mostly female virtue. Recently even Peter Sutton wrote about De Hooch: 'The orderly context of de Hooch's interiors and their adjoining

courtyards and gardens create an eminently comforting home environment, the objective correlative of domestic virtue.⁴ I would like to go into some aspects of these paintings that have, in my view, been underestimated in terms of their significance. I will be concerned here with the way in which their interior space is constructed, and I will look at the relation between the figures and the space they are in – a relation that is very different from the way figures and space are related in portraits and in genre paintings. It seems to me that both aspects can be seen in terms of an analogy to landscape painting.

The Dutch interior scene – Dou, Maes, especially De Hooch, to a lesser extent Vermeer – almost never represents a closed room. The room is 'see-through': the interior is opened up by doors and windows, staircases and archways, but also by mirrors, maps, picture-within-a-picture, etc., to the effect that the space is widened and acquires depth, while a 'secondary scene' is simultaneously created within the image. The practice of dividing the image, and of splitting up a story into episodes, or to comment upon the painting's main subject, is of course very old. In her recent book *An Entrance for the Eyes* Martha Hollander argues that 'the ancillary space in Dutch art (is) both a diagram and a spatial mimetic'.⁵ So there is a special and independent interest in an almost illusionistic rendering of the interior space and of how its parts create a 'realistic' whole. 'At the same time these spatial divisions are invested with older, traditional visual codes. The "secondary scene" can serve rhetorically as an ancillary image, a way to enrich the scene with antithesis, parallel, irony, or

explanation'.⁶ Hollander discusses convincingly a series of examples and interpretations, where the meaning of the image can indeed be developed from bringing together the different situations and characters, and where the spatial division is recuperated as a rhetorical device. Hollander's interpretation doesn't work however, when – as is the case in a series of paintings by De Hooch – the 'secondary scene' stays empty, without story, and shows nothing but space itself. These images can easily be integrated in Hollander's line of thinking, if one just takes her argument one step further. The empty side-rooms and views bring a depth into the house that does to the interior what the distance does within the landscape.

A landscape is essentially a representation of the World – the World being different from and wider than the field of action or the 'environment' of human actors.⁷ The World is not the scene or background for human adventures, the world does not 'surround' actors and their interests, but confronts the viewer, and relates to the 'distance' (in most cases the horizon). Figures and situations are situated so that they clearly cannot fill the world – nor the image. In a landscape representation, this World – a version of a Kantian Idea – that is forgotten in life and action, is brought to the fore and offered to meditation. The 'see-through' ('doorsien') as De Hooch uses it, is a means to bring the 'distant' in the interior – as it is done in the landscape – and thereby visualises a dimension of the house that is forgotten in daily life, and that is negated by identifying woman and house.

The interior paintings by Pieter De Hooch are not portraits, showing faces and people in their

environment. They are not like genre paintings that present human situations and anecdotes, in a theatrical mode, so that the 'place of action' is represented also, as a decor. He situates characters and activities in an interior space, but so that these can never occupy or fill the space. They never take over the picture plane like an actor would dominate the theatre scene. They are, exactly like figures in a landscape painting, too small for the world that appears behind and next to them and thereby becomes something in itself. One can see how De Hooch sets up his images to produce this effect: his interiors are not open and directed to the viewer, but to some kind of distant 'elsewhere'. For a spectator used to bourgeois culture, his houses do not only feel empty and rather cold, they don't seem cosy, but they are in an almost unrealistic way open and wide or deep. De Hooch opens up his interior spaces through opening perspectives: views through windows and doors, views into halls and side-rooms, so that one looks out onto landscapes or façades, or so that passing through outside space – as across streets – one looks into rooms and houses again. He opens up secondary perspectives through figures who look out through doors and windows at views that are not visible for the beholder, he shows light falling in without indicating its origin, he uses staircases to suggest vertical depth in the interior space, etc. He often opens up the rooms in two or three directions at once, and so intensifies the sense of depth.

In these interiors De Hooch paints women, most often pursuing their daily, homely activities, sometimes alone, sometimes in the company of their maid or children. But at the same time he does

not represent the interiors they are in as a hearth. The women are present and 'at home', but their presence and activities do not fill and do not define the space. Peter Sutton notices this when he writes that De Hooch's paintings praise the mothers and housewives, but 'together with the investigation of complex and subtly observed effects of light in the interior space'.⁸ There is more 'space' than the intrigue or situation asks for, but Sutton reduces that surplus to an opportunity for demonstrating the painter's ability in the rendering of light effects, unrelated to the meaning of the image. Or he interprets the wideness and openness symbolically: 'In the context and by their nuance and richness' these space-and-light effects supposedly work as a metaphor for 'the wealth of subtle pleasures afforded by burgher home life'.⁹ The sense for 'orderly spatial design' is supposed to arise from an interest in 'maternal and domestic subjects'.¹⁰ What Sutton does not see here is that in these images the female personage, indeed reduced to a housewife, is *opposed* to and exposed to an inhabited, empty, almost abstract space. De Hooch gives the house the depth and the distance (or 'elsewhere') of a landscape, and thereby announces the World to the interior – a World these women seem almost unaware of.

The woman can take on a different meaning and position too. Martha Hollander illustrates this with a series of images by Nicolaes Maes (Fig. 3).¹¹ In these examples Maes divides his painting by means of 'see-through' into two different rooms or scenes, with the woman in two different roles: the housewife catches the maid who in the next room or the kitchen is dreaming away or is flirting.



Figure 3. Nicolaes Maes, *The eavesdropper*, 1657 (Dordrechts Museum).

Hollander argues very well that these images do not just illustrate moral lessons or encourage the housewife to take care of her household, but also show and associate two sides of the feminine and thereby suggest a 'structural weakness' and unreliability in every woman – and every housewife. De Hooch too associates in some paintings the depth effect with a sometimes tiny, almost hidden female figure, 'waiting' there in the distance as 'elsewhere' in a similar logic he often confronts by

way of a picture-within-the-picture the bourgeois or homely scene with a mythological, often explicitly erotic nude: the contrast reveals the hidden dimension of woman that is not Hestia. The femininity is, so it shows, so complex that in one and the same type of image, the female figure can be opposed to the 'distant' but can embody it as well. Many romantic landscape painters – David Caspar Friedrich is a well-known example – also made interior paintings and thereby transferred means to

evoke depth in the interior, and linked depth to woman. The half-dark, the corner, the staircase, and the dim female figure bring the distant close – they create intimacy – just as twilight and dusk make the horizon come near.

The complexity of the relation between domesticity and femininity, and the ambiguity of both terms, comes out even more in the possibility of completely identifying the female figure with the counter-force that can save from the suffocating house and the sick home. In this context the work of the nineteenth century Antwerp painter Henri De Braekeleer is particularly interesting and revealing.¹² A large part of his oeuvre follows the seventeenth century Dutch models that he greatly admired. Yet, his *interiors* and personages have an entirely different 'tonality'. The spaces that open up within, from one room or space to the next, become chaotic and lose their clarity, the interiors become more and more closed and seem to close in on the lives that inhabit them. Even the women at the open windows don't relate to distance, but are fixed at their place in a world without escape or alternative possibilities, a world where everything is stiflingly close by and crowds in, where the rooms and walls move to the fore oppressively. In a period when his Dutch examples were looked at as literal descriptions of daily lives, De Braekeleer, in some paintings, hid secret messages, criticising these interiors and the life they stand for. One of his famous paintings, *The man at the window*, shows an empty, uninhabited room, where a slouching man looks through a window without a view – nothing but roofs and rear sides. But De Braekeleer, a bachelor himself, hides in the

man's mirror image reflected in the windowpane, a woman with an earring, a scarf, a fancy hat and a dressed collar (Figs. 4 and 5). In these interiors the secret presence of a woman in street-clothes is all that remains of distance.

Against the tradition that links femininity to the house and domesticity, one can oppose the tradition that links the feminine with the distant that goes against the domestic. Nietzsche evokes this image of woman as a sailing boat that glides across the dark sea of existence, far away, quietly, meditative: 'All big noise makes us locate happiness in silence and distance'.¹³ Man who, for himself, struggles with life and creation, sees 'silent magic

Figure 4. Henri de Braekeleer, *The man at the window*, 1973 (Royal Museum of Fine Arts, Brussels).





creatures pass before him in the distance and longs for their happiness and withdrawal – they are women.’; ‘The enchantment and the most powerful effect of women is ... an effect at a distance, an *actio in distans*.’ Distance only ‘works’ – from a distance. Therefore, according to Nietzsche, one primarily ought to keep ... distance! Of course, in reality the world there, far away, is not as it seems. ‘My noble dreamer’, Nietzsche writes, ‘there is always so much noise

and petty busting on those sailing-boats!’ Those blue-white distant worlds on the horizon of the paintings of Patinir or Altdorfer are, in reality, small and crowded and noisy, like everything else here!

The idea that both woman as housewife and as seducer are male phantasms, or that the reduction of femininity to hearth and the dream of woman’s distance are complementary sides of one and the same strategy, does not bring us any further. Thinking is not about unmasking, but about testing and developing the conditions of meaning. The insight that woman incorporates ‘all the quietness and the silence of the world’, but only in David Caspar Friedrich’s paintings, that rooms are deep like the world, but only in the paintings by De Hooch, and that a woman can be the last secret hope of a life, but only in *The man at the window*, does not *unmask* these images. Everybody knows that meaning is not ‘real’ and that meanings we live by do not exist as facts. Thinking is not about unmasking as if it were ever possible to be ‘outside’. It is about using the one meaning to delineate the claims of the others, so that no single meaning or representation can be appropriated and turned into an absolute. Thinking is about trying out words and images so that the possibilities a culture can offer are formulated and opened up for judgement and life. Thinking is about cultivating the distance and the reserve that is necessary to allow this complexity to be.

Notes and references

1. I take this seventeenth century motto from P. Sutton, *Pieter de Hooch, 1629–1684* (London, Yale University Press, 1998), p.73.

Figure 5. Henri de Braekeleer, *The man at the window*, 1973 (Royal Musea of Fine Arts, Brussels) (detail).

2. J.-P. Vernant, 'Hestia-Hermès. Sur l'expression religieuse de l'espace et du mouvement chez les Grecs' in: J.-P. Vernant & P. Vidal-Naquet, *La Grèce ancienne. 2. L'espace et le temps* (Paris, Seuil, 1991), pp. 47–99.
3. M. Serres, *Atlas* (Paris, Julliard, 1994), p.48.
4. P. Sutton, *Pieter de Hooch, op. cit.*, p.30.
5. M. Hollander, *An Entrance for the Eyes: Space and Meaning in Seventeenth-Century Dutch Art* (Berkeley, University of California Press, 2002), p.46.
6. M. Hollander, *An Entrance for the Eyes, ibid.*, p.47.
7. See B. Verschaffel, 'De Wereld van het landschap', *De Witte Raaf*, 95 (2002), pp. 1–4.
8. P. Sutton, *Pieter de Hooch, op. cit.*, p.30.
9. P. Sutton, *Pieter de Hooch, op. cit.*, p.30.
10. P. Sutton, *Pieter de Hooch, op. cit.*, p.30.
11. M. Hollander, *An Entrance for the Eyes, op. cit.*, Chapter three: 'Nicolaes Maes: space as domestic Territory'.
12. I wrote on De Braekeleer in 'Het heimelijke van Henri De Braekeleer': B. Verschaffel, *Figuren/Essays* (Leuven, Van Halewyck, 1995), pp. 144–177. The only existing overview of De Braekeleer's oeuvre is the catalogue of the 1988 Antwerp exhibition: H. Todts, *Henri De Braekeleer. 1840–1888* (KMSK, Antwerpen, 1988).
13. F. Nietzsche, *Fröhliche Wissenschaft*, II, 60.

Part 5

Problems of building

If the masters of modern architecture were in the habit of claiming for themselves the role of important technical innovators, then the collective history to which modern architecture has wanted to lay claim has repeatedly stressed the movement's creative response to a changing technical environment. Both sorts of claim may, upon investigation, turn out to rest upon fairly insubstantial evidence. Two of these three papers, however, reveal undoubted masters grappling creatively, though not always expertly, with newly available technologies while the third presents an evidently un-typical case in which the development of architectural form arose from the incidence of very specific technical circumstances.

Leonard K. Eaton shows how Frank Lloyd Wright, intuitively aware, from early in his career, of the potential of reinforced concrete to form cantilevered, 'flying' planes, resisted the classicising language of the concrete column until, presented with the elegantly resolved language of Robert Maillart's mushroom columns, he began (via an un-makeable proposal for a cocktail glass) to develop his own version. In doing this, his intuition clarified the structural principle of mushroom columns (essentially, that of a three-dimensional portal frame) with the insertion of an implied hinge at the foot of the columns, while his anti-classical prejudice led him to claim the form inspired by the form of trees – precisely what it was not.

H.P. Berlage, with the architecture of his Beurs, emerges, in Jan Molema's paper, as an attentive follower of Viollet-le-Duc from whose theoretical writing he took up the 8:5 'Egyptian' triangle and ran with it, transforming an inert numerical ratio into a marvellously responsive spatial and constructive principle. From Viollet-le-Duc he also absorbed the thought that iron and masonry could combine in a visually and structurally rational system; lacking the technical mastery of iron structures, Berlage's collaboration with his engineer produced a truss design which failed to satisfy either technically or visually.

The paper from Philip Goad and Julie Willis uncovers the remarkable architectural consequences of collaborative American/Australian design during the second World War, obliged to employ unseasoned Australian hardwood in place of preferred European or American softwood. Post-war architecture in Australia is shown to have been decisively modified by these experiences, a process which, it is hinted, may have been replicated in other parts of the world, giving rise to a changed profile of architectural practice in the post-war years.

Frank Lloyd Wright and the concrete slab and column

Leonard K. Eaton

This paper traces the development of Frank Lloyd Wright's ideas on the place of the concrete column and slab in architecture. It deals with his first employment of the slab at Unity Temple (Oak Park, 1904) and his use of the form in residential projects during the next few years. It surveys American literature on concrete construction and briefly analyses the contribution of Claude A.P. Turner and the employment of the Turner system in two Chicago buildings that Wright would have known. It discusses his project for the San Francisco Call (1912) and the use of the Barton system in the Richland Center warehouse for A.D. German (1915). It further discusses his first probable knowledge of the more sophisticated concrete slabs of Maillart, published in 1926, and of Maillart's invention of a proto lily-pad capital. This capital is also to be seen in Wright's champagne glass designed for Leerdam (1930) and in his project for the Salem Capitol Journal of 1931. Finally it is argued that the much admired lily-pad columns at the Johnson Wax office building (Racine, 1937–39) are really a series of three-hinged bents rather than shell construction.

In his eloquent narrative, 'Designing Unity Temple', Frank Lloyd Wright indicates that the building had to be made of concrete for reasons of economy. He then asks the rhetorical question: 'What had concrete to offer as a cover shelter? The concrete slab – of course. The reinforced slab. Nothing else if the building was to be thoroughbred, meaning built in character out of one material.'¹ The difficulty with his account is that it was written approximately 25 years after the event. And, as so frequently occurs in the fascinating but maddening pages of *An Autobiography*, he omits or distorts some of the major considerations affecting the technology of the building. It was the first concrete slab that Wright actually built, but he had been interested in the material for some time, though not in slab form. It is necessary to begin with a

review of concrete construction at the time Wright entered practice.

Like most progressive young architects around the turn of the century, Wright was fascinated by reinforced concrete. No one was sure what could be achieved with the new material, but it was clear that the possibilities were enormous. Depending upon its use, it might combine the tensile strength of steel and the compressive strength of stone. Hence the field of concrete construction was filled with inventors who sought to capitalise on its possibilities. The intensity of the interest is suggested by the treatment of concrete in Frank Kidder's *Architect and Builder's Pocket Book* between 1885 and 1905. This volume, first published in 1884, was for two generations probably the most common structural reference for

American architects. In 1885 Kidder's manual featured one page on concrete. The author regarded it as a good material for foundations. Twenty years later in his 1905 edition Frank Kidder needed 67 pages to discuss various kinds of beams, slabs, frames and types of reinforcement. Whether or not Wright knew Kidder's work we cannot positively say – but it would have been surprising if he didn't. Writing in 1928, a few years prior to the composition of *An Autobiography*, he stated that the physical properties of concrete were well understood, but that 'Aesthetically it has neither song nor story.'² He added that it was essentially a conglomerate, and that cement, the binding material, was in itself characterless. 'As a material,' he wrote,

'it is its misfortune to project as wooden beams, travel molded as cornices. Yet it will faithfully hang as a slab, stand delicately perforated like a Persian faience screen or lie low and heavily in mass upon the ground. Again, unluckily, it will stand up and take the form (and texture too) of wooden posts and planks. It is supine, and sits as the fool, whose matrix receives it, will.'³

The language reveals something of Wright's scepticism about the structural uses of concrete up to that time. It may also reflect his own experience. Here we should note Wright's attitude towards technology. With his life-long interest in nature as the basis of organic architecture, Wright was unquestionably a Romantic. He depended on intuition and feeling, and too often discounted the rational approach to creative building. Fortunately during the first part of

his career he was able to call upon the capable services of Paul Mueller in the erection of his large structures: the Larkin Building (Buffalo, 1904), Unity Temple (Oak Park, 1904), Midway Gardens (Chicago, 1914) and the Hotel (Tokyo, 1916–22). Mueller should receive substantial credit for the success of these structures.

Not only did Wright's demands on his materials often exceed their physical properties, he also 'pressed the envelope' in terms of structural form. Throughout his career his demands generally exceeded the known capabilities of his materials. This was true whether he was designing glassware for Leerdam or a structural element in a building. He always wanted to be on the frontier. At the same time he was extremely alert to any new developments in building. As a consequence of this combination of attitudes his structures showed remarkably few failures but a good many deflections.⁴ In the passage just quoted, Wright observed that concrete could unfortunately take the form (and texture) of wooden posts and planks. It was such a post-and-beam system that Wright employed in the important but problematical project for a Village Bank, first published in *The Brickbuilder* in August 1901 (Fig. 1). This project has a curious history. Grant Manson found a small pen-rendered perspective of the identical design labelled 'Study for Concrete Monolithic Bank, 1894'. In the published version, however, Wright declared that 'The building is constructed entirely of brick', and added, 'The design makes use of the structural feature of the piers carrying ceiling beams of the long span as the decorative element providing the enrichment of the façades . . .'⁵ The

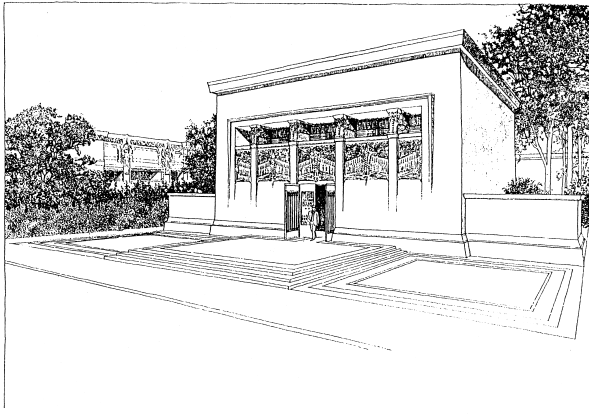


Figure 1. Village Bank project, 1894. (source: Frank Lloyd Wright, *Ausgeführte Bauten, und Entwürfe*, Berlin, 1910)

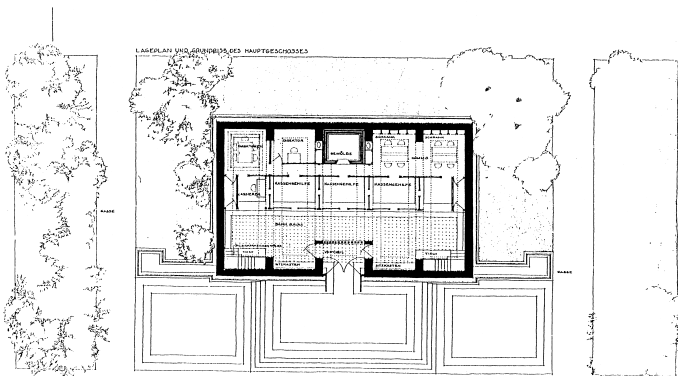
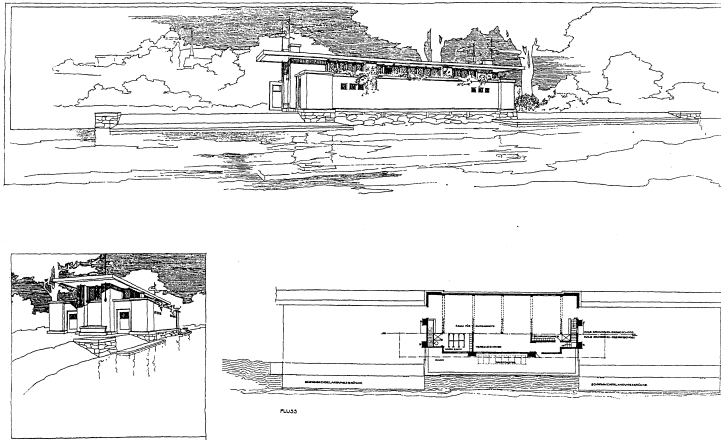


Figure 2. Yahara Boat Club project, 1905. (source: Frank Lloyd Wright, *Ausgeführte Bauten, und Entwürfe*, Berlin, 1910)



ceiling beams would presumably have been of concrete. In terms of the building technology of the day, the structure would not have been anything unusual. It appears, then, that the original project was for concrete, probably not reinforced, but when Wright was offered an opportunity for publication, he saw that it could be done in brick. When he again published it as plate XI in the *Ausgeführte Bauten und Entwürfe* (E. Wasmuth, Berlin, 1910) he reverted to the original designation. The edifice would have been richly decorated, but in form it would have been, as Grant Manson remarked, 'an uncompromising cube'.

In the years immediately after 1900 Wright moved away from the post-and-beam system of

the Village Bank Project and began to concentrate on cantilevered slabs, many of them in concrete. The reasons for this new direction are unclear. One is tempted to speculate on the importance of the lost pavilion for the Universal Portland Cement Company at the Pan-American Exposition in Buffalo of 1901. Presumably the company would have wanted a structure that displayed the capabilities of its products. Hitchcock believed that the pavilion resembled the unbuilt Yahara Boat Club project of 1905 (Fig. 2). The correspondence makes it perfectly clear that Wright visualised a building executed in frame and plaster.⁶ At some later date he decided that the boat club's massing and daring cantilever were more suitable for construction in concrete, and publicly pronounced it concrete in

the 1931 European exhibition of his work. Indeed, it is difficult to see how the cantilevered slab would have endured in any other material.

Wright's first concrete slab of substantial size came at Unity Temple (Oak Park, 1904), one of the most important buildings of his entire career (Fig. 3). Originally a solution in brick was proposed, but that material was too expensive. In the *Ausgeführte Bauten* of 1911, the only contemporary account by Wright of the technology of the building, he states that 'the roofs are simple reinforced concrete slabs, waterproofed'.⁷ This assertion is not strictly true. The auditorium is actually top-lit by a steel lattice, which contains panels of leaded glass (Fig. 4). This lattice is really a continuation of the four slabs that are cantilevered out from the corner piers. The whole structure fits together as neatly as a jigsaw puzzle. The slabs sail over the exterior walls with a margin of about 2 in (50 mm) – a perfectly clear statement that the exterior walls of the building are entirely separate from the roof. The opening is not visible in any drawing or model, but it is of the utmost importance as a subtle but forceful expression of the cantilever, a structural principle that Wright was to use extensively in the next few years.⁸

In one sense there was nothing unusual about Wright's slabs of 1904. By that year it was generally known that the concrete slab responded to beam theory. There is a substantial literature that makes this point clear. F.E. Turneaure and E.R. Maurer in their authoritative *Principles of Reinforced Concrete Construction* (New York, 1905) held that the flat slab supported on four sides was essentially a special case of the beam.



Figure 3. Unity Temple. (photograph by Sidney Robinson)



Figure 4. Ceiling, Unity Temple. (photograph by Allen Cunningham)

The authors were aware that the shearing stresses were dangerous only in exceptional circumstances, such as when a heavy load was applied close to a support. As one studies this literature of 1900–1910 one is impressed both with what was known and with the large areas of ignorance. There was, for example, no generally accepted definition of the word 'modulus'. Several authors were aware that there was a fatigue limit in the metal reinforcement, but there was a good deal of doubt as to how that limit could be figured. Nonetheless, there was enough knowledge that Wright (and

Mueller) could safely pour their slabs and calculate their strength. What was unusual was the use of a building element devised as a floor to be a roof. Frederick W. Taylor and Sanford E. Thompson in the second edition of *Concrete: Plain and Reinforced* (New York, 1904 and 1909) listed no less than 37 types of slab reinforcement, many of them patented. Most of these systems were for floor slabs. Wright, however, was not interested in floors in Unity Temple. He wanted slabs that could be cantilevered outwards from the great corner piers, over the walls and, on the interior, bound to the steel lattice that contained his leaded glass. Wright's slabs really held up nothing except themselves. Their use was a remarkable architectural and technological innovation for 1904. As Wright later noted, the slabs had to be reinforced, and the type of reinforcement must have been a substantial question for Wright and Mueller. Wright gave Mueller full credit:

'It is exciting to him to rescue ideas, to participate in creation. And together we overcame difficulty after difficulty in the field, where an architect's education is never finished.'⁹

Exactly what kind of slabs did Wright and Mueller build at Unity Temple? The answer to this question is rather startling. A recent structural survey found that the reinforcing bars ran perpendicular to the edge of the overhang, and turned up approximately 6 in (150 mm) from the outer edge. Some of these bars are 1 in in diameter, and are twisted, square reinforcing bars, while others appear to be 0.5 in diameter, smooth round bars. All bars are

irregularly spaced from 8 to 16 in (200–400 mm) on centre. They are of varying lengths, and extend from 2 to 5 ft (0.6–1.5 m) from the fascia. These bars appear to turn up into the slab or edge beam along the fascia, but this point is not entirely clear. There are two round bars running parallel with the fascia, located approximately 5 and 10 in (125 and 250 mm) from the edge of the overhang. There is approximately 2.5 in (60 mm) of cover below the bars. The reinforcing bars running perpendicular to the fascia apparently hook over these two bars, and turn up into the slab or the edge beam. In short, the reinforcing in the slab looks very much like an ad hoc solution. Where there seemed to be a need for a rebar, Wright and Mueller put it in. The surveying engineers found a good deal of delamination in the structure. That it has endured as well as it has is something of a miracle. After almost a century there is remarkably little deflection visible in the slab.¹⁰

Wright's next use of the concrete slab was in his third project for the *Ladies Home Journal* in April 1907, and was entitled 'A Fireproof House for \$5000' (Fig. 5). In his description of the building he wrote:

'The walls, floors and roof of this house are a monolithic casting, formed in the usual manner by a wooden false work, the chimney in the centre carrying, like a huge post, the central load of floor and roof construction. Floors and roof are reinforced concrete slabs approximately five inches thick if gravel concrete is used. The roof slab overhangs to protect the walls from sun and the top is waterproofed with a tar and gravel roofing

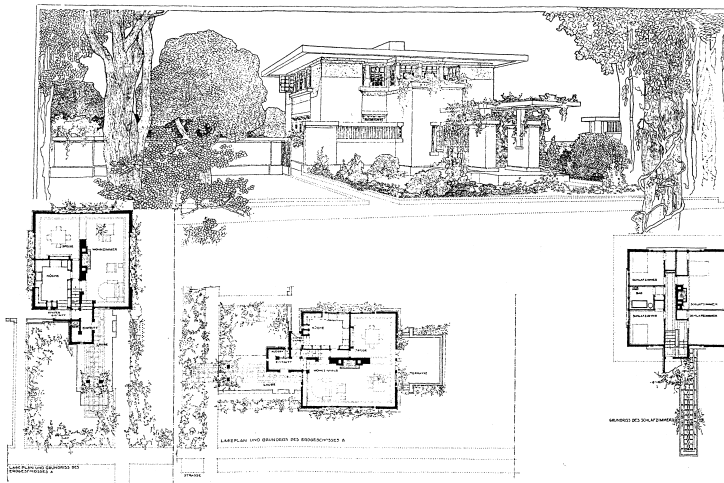


Figure 5. Fireproof house for *Ladies Home Journal*, 1907. (source: *Ausgeführte Bauten*)

pitched to drain to a downspout in the chimney flue which is not likely to freeze.¹¹

In structural terms Wright was here thinking very much as he had at Unity Temple. The cast slab was the crucial part of the system. Recently Curtis Besinger noted that Wright used concrete as '... massive planar elements and piers that enfolded and defined the spaces. Enclosure was completed by glass elements inserted between the concrete elements'.¹² As will be noted, Wright's system was dramatically opposed to that of Auguste Perret, the other great virtuoso in reinforced concrete of his generation. The unbuilt studio house for Richard Bock,

first published in 1908, also employed the same building technology based on the concrete slab, as did the project for a concrete apartment house for Warren McArthur (Chicago, 1906).

In 1908 an event occurred that was to influence profoundly Wright's future use of the concrete slab. Claude A.P. Turner of Minneapolis patented the first mature system of column and slab framing. To thinking engineers it had long been obvious that the whole apparatus of under-girders and beams could be dispensed with if the column and slab could be designed as a unit. Turner accomplished this objective by combining concentric, radial, and continuous multiple-way reinforcement with a

flared capital whose purpose was to reduce the shearing stress at the perimeter of the column. This capital, which was frequently accompanied by a drop panel, was mushroom shaped and gave its name to the system. Though Turner's patents were finally thrown out of court and those of Orlando W. Norcross were upheld, the Turner system was quickly adopted by architects all over the country. It was particularly useful for designers who were confronted with the problems of industrial buildings and of multistorey structures.

Thus Turner made a major contribution to the development of the slab. Professor Emory Kemp remarks:

'His development of the two-way slab moved concrete from a material imitating timber, masonry, and even iron structures into a field where it was unchallenged in providing moments and torsion in two directions.'¹³

The elastic solution involves a fourth-order partial differential equation, and it is highly unlikely that Wright ever understood the two-way bending of a flat slab floor. Nonetheless, he was an architect with an amazing structural intuition, and it must have been clear to him that something remarkable had happened in the realm of concrete. At the minimum he probably understood that the new and improved type of slab construction dictated columns with a new kind of capital to take the shear that they generated.

That Wright was interested in the new type of slab construction during the decade prior to the First World War is highly probable. That he knew

of the new type of slab developed by Turner cannot be proven – but it would have been surprising if he had been ignorant. His career is full of instances where he was silent about his professional obligations. For example, he never mentioned his conflict with William Nelson, an inventor who developed a system of concrete blocks much like the textile blocks that Wright developed for his California houses of the 1920s. Nelson confronted Wright with claims of patent infringement and, says Robert L. Sweeney, 'Wright's response was circumspect at best . . .'¹⁴ In much the same way he never acknowledged the impact of the Viennese Secession on his decorative designs for Midway Gardens.

Because the Turner slab and its supporting column were to be profoundly influential on Wright, let us look at two pre-war buildings that might well have been known by Wright. The first is the Dwight Building by Schmidt, Garden and Martin (Chicago, 1911). H. Allen Brooks writes of its ' . . . structural logic, predominant horizontality and disdain for historicism . . .'¹⁵ and correctly notes that for Hugh Garden, the building's designer, it was the end of a line. Yet Brooks nowhere observes that the Dwight Building was framed in reinforced concrete on a flat slab system (Figs 6–9). Perhaps this is not surprising. On the basis of experimentation with my former colleagues in Ann Arbor I shall argue that there is no way of telling how the building goes together on the basis of exterior photographs alone. The other structure is the Lakeside Press for R.R. Donnelly and Sons Company of 1912 by Howard Van Doren Shaw (Figs 10 and 11). As the photograph indicates, the



large interior is spacious and well lit – and it can safely accommodate heavy rolls of paper and even heavier presses. In passing, the utility of the slab for printing establishments is worth noting. It would take very heavy loads and was almost vibrationless. Garden was for a time a member of the Prairie School, and knew Wright well. Shaw was almost Wright's exact contemporary, and though he was at odds with Wright architecturally, the two men liked and respected each other. Nonetheless we would have to admit that neither Garden nor Shaw, who were quite different architects, moved very far in giving the flat slab a distinctive architectural expression. In a certain sense structure was

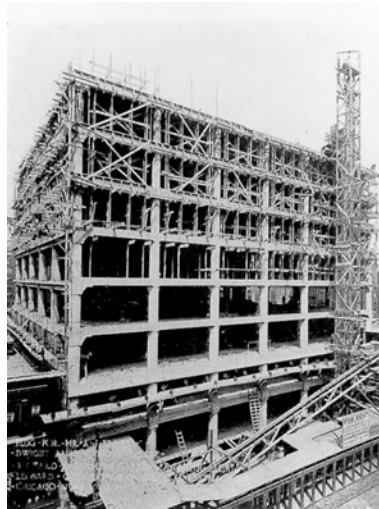


Figure 6. The Dwight Building, Chicago, 1910–11. Schmidt, Garden, and Martin. This photograph, and its companions, are taken from *Built by the Leonard Construction Co.* (Chicago, 1917). I have seen only a single copy of this publication. It is in the architectural library of the University of Michigan.

Figure 7. The Dwight Building under construction.

Figure 8. The Dwight Building under construction.

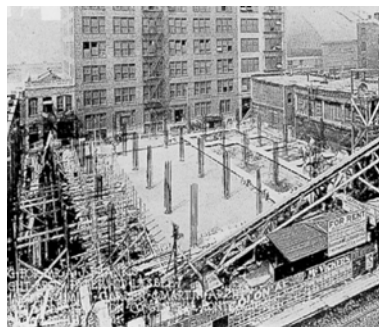
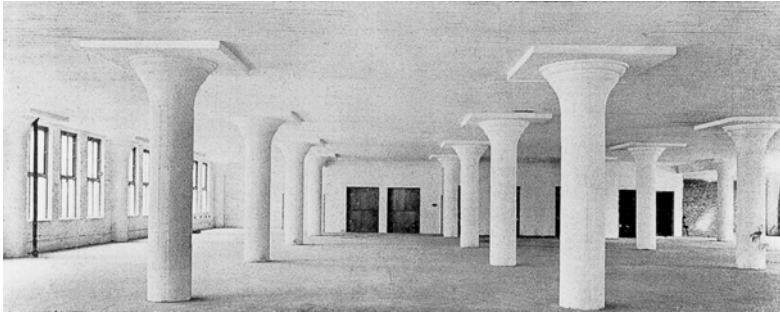


Figure 9. The interior of the Dwight Building on completion.



irrelevant to design in these buildings. Architecture was something that was draped over a system of columns and slabs. It remains to be noted that both buildings were erected by the Leonard Construction Company, the Chicago experts in reinforced concrete construction.

Wright's first large project in the new type of slab is the interesting but structurally improbable project for the *San Francisco Call* of 1912. The model and two plans for this building were published in *The Work of Frank Lloyd Wright, Wendingen* (republished by Horizon Press, 1965) (Figs 12 and 13). It would have been a structure about 20–21 storeys in height – by no means an impossibility with the building technology available at the time. The plans are clearly marked 'Reinforced Concrete Skyscraper – slab construction'. While these plans are not dimensioned, the building could not have been more than about 30 ft (9 m) wide at the utmost. If we take a dimension of 8 ft (2.4 m) for the staircases and grant a

possible extension of the slab bay to 30 ft, this conclusion seems inevitable. If built, the structure would have been one of the most attenuated skyscrapers imaginable.

In an article for the *Concrete Engineers Handbook* of Hood, Johnson and Hollister (New York, 1918), Professor Walter C. Edge analysed four different classes of slab and seven patented systems, the majority of which were operated under licence from the Flat Slab Patents Company of Chicago, a creation of Clifton S. Leonard. In 1915 Frank Lloyd Wright was confronted with a commission in which the use of one of these patented systems was mandatory. This was the A.D. German Warehouse in Richland Center, Wisconsin (Figs 14 and 15). It was to house the business of Albert D. German, a prosperous dealer in flour, feed and cement in the town where Wright had been born.¹⁶ In addition to the space for the storage of wholesale goods the programme included a small teahouse restaurant, specialised retail shops, a wholesale outlet store,



Figure 10. Interior of the Lakeside Press.

Figure 11. The Lakeside Press, Chicago, 1912. Howard Van Doren Shaw.

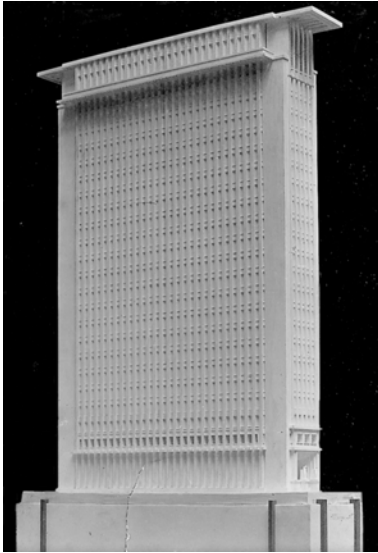
and a gallery for local and regional artists – rather an ambitious project for a small town warehouse. Nonetheless the core of the building was the warehouse space, and for it Wright had to choose one of the patented flat slab systems. To do otherwise would have been to neglect the benefits of the latest building technology and perhaps risk structural failure. For Wright this was simply inconceivable. We can assume that he was familiar with all the flat slab systems. In this instance he chose the Barton or Spider Web System. Why?

There are two distinct possibilities, but no testimony from the architect himself. The first is the organic reference. In view of the importance of abstraction from the natural world in Wright's organic design, it is entirely possible that a system based on a spider web might have appealed to him. The second possibility lies in the character of the system itself. According to Edge, the Barton system was similar to other flat slab systems as to the arrangement of columns, column heads, and drop



panels, but differed radically in the type of reinforcement. Without becoming overly technical, we can say that its distinguishing feature was that the reinforcing web ran through the entire apparatus of columns, capitals, drop panels, and floors so that the whole thing was conceived as a single unit. It was '... a four-way system in which all the major slab reinforcement units of negative (column head) and positive (slab centre) steel, lap past each other so as to provide steel at top and bottom of the slab in the region of shifting inflection.'¹⁷ The patent

Figure 12. *San Francisco Call* project, 1912. (source: Frank Lloyd Wright Archives)



office drawings for the Barton system make clear that a series of ingeniously designed metal connections is the outstanding feature (Fig. 16). The Barton engineers believed that the methods of arriving at bending moments advocated by the American Society of Civil Engineers were the most mathematically correct but that the coefficients were needlessly conservative. The Chicago code was the most satisfactory for practical use. With the possible exception of the cantilever flat slab, the Barton system was both the strongest and the most

elegant structural method available to Wright for his warehouse.¹⁸

An examination of the system as it exists today in the A.D. German warehouse shows that Wright's columns here are distinguished from those of his contemporaries in two principal ways. In the first place he gave them a square plan. As so frequently with Wright, there may have been at least two reasons for this decision. His fondness for the square is well known. But the decision also makes sense in terms of the concrete building technology available to him in Richland Center in 1915. The town was (and is) in a rural part of Wisconsin. Square forms would have been easier for the local carpenters to build than the more commonly used circular forms. Accounts of the building process make clear that the warehouse was put up by an eight-man crew with a chain-driven mixer. In this situation a sophisticated building technology was simply impossible.¹⁹

In the second place, he designed a column head that flares dramatically (Figs 17 and 18). That he intended his capitals to be visible is clear from the original rendering as published in *Wendingen*. Those at the entrance to the building were ornamented with a motif closely related to that which was used on the upper storeys of the exterior. The flaring form distributes the shear inherent in the system in a manner that anticipates the more elegant solutions that Swiss designers were to achieve in the late 1920s. The result is, of course, radically different from the conventional use of the Barton system as seen in a contemporary building for the Stewart Warner Speedometer Corporation in Chicago (Fig. 19). The drawings in the Barton patent of 1915 suggested

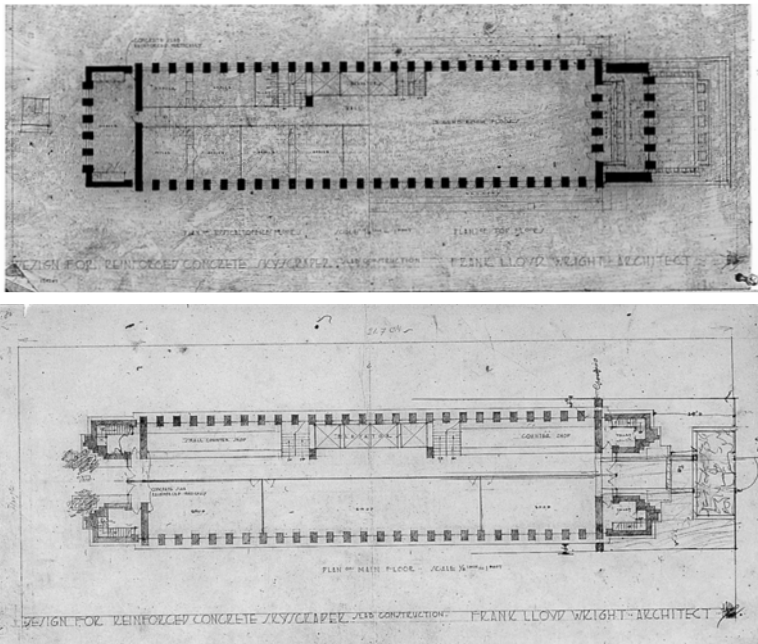


Figure 13. *San Francisco Call* project plan. (source: Frank Lloyd Wright Archives)

an octagonal form, but the final choice was of course up to the individual designer.

Here, then, is Wright's first realised project involving the new type of slab and column. Whether or not he was satisfied with the entire building is hard to say. In the *Wendingen* publication of 1926, for which Wright supplied drawings and photographs, there were three exterior views and a ground plan

but no text or description. Up to the present time I am not aware of any published illustrations of the interior. I am inclined to believe that there is a very good reason for this situation. If Wright had published it, the space would not have looked very different from most other warehouses of the period; in fact, it would have appeared less well lit than many. And it would have been clear that he was

Figure 14. A.D. German Warehouse, Richland Center, Wisconsin. Frank Lloyd Wright, 1915. (source: Wendingen)

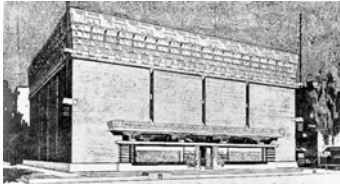


Figure 15. A.D. German Warehouse, ground floor plan, (source: Wendingen)

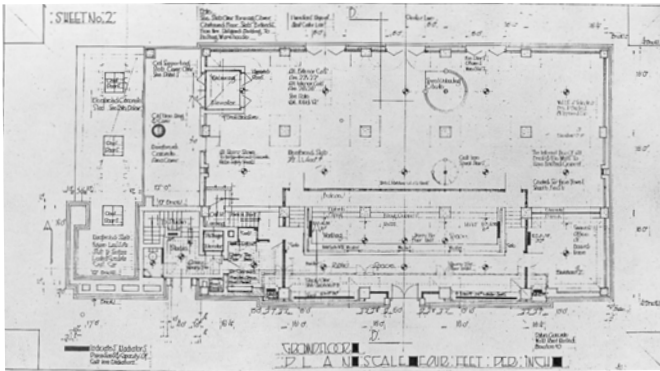
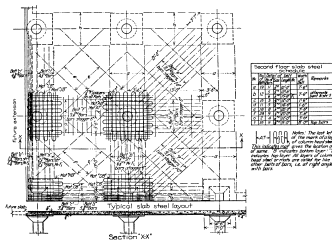


Figure 16. Barton Spider WebSystem Diagram, (patent drawing)



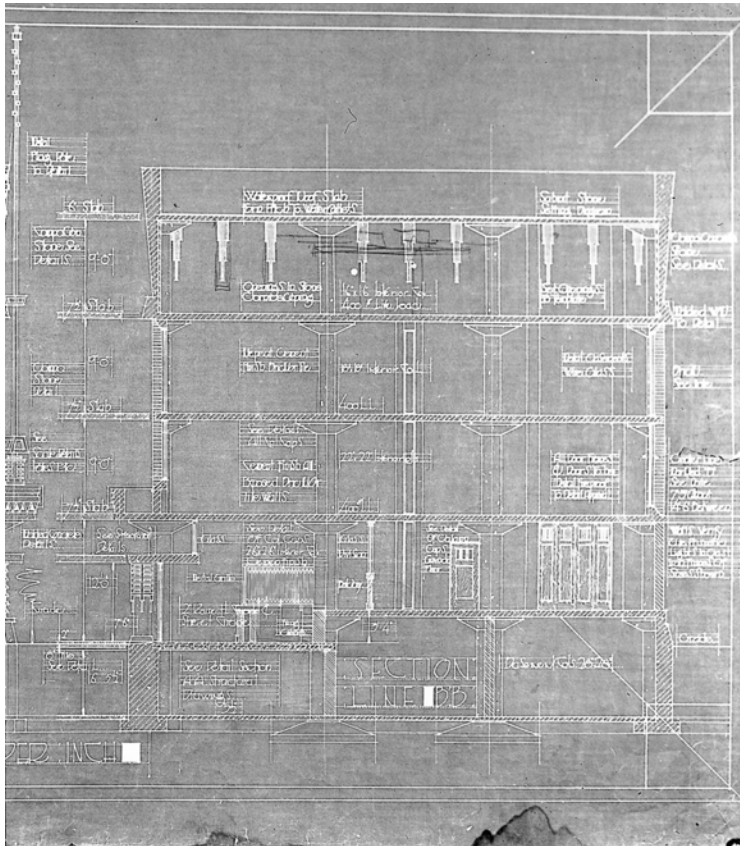
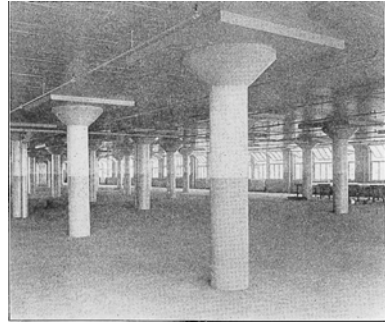


Figure 17. A.D. German Warehouse, section, (source: Frank Lloyd Wright Archives)

Figure 18. A.D. German Warehouse, interior, (source: Lou Coopey, Richland Center, Wisconsin)



Figure 19. Stewart Warner Speedometer Corporation Building, Chicago, (source: *Built by the Leonard Construction Company*)



using a structural system not of his own devising – always an unpleasant position for an architect of wilful originality. This might be sufficient cause for the biting language of the 1928 essay on concrete – but there is another even deeper reason. During his entire architectural career of more than 60 years Frank Lloyd Wright was in revolt against the categories of Renaissance architecture. His attacks are so well known that there is no point in quoting them. What has perhaps been insufficiently noted is that, in accordance with his doctrine, he abjured almost entirely all kinds of load-bearing columns in the practice of his first 25 years. One can go through the enormous production of prairie houses without finding anything that passes for a column. One can examine large buildings like the Midway Gardens and the Imperial Hotel without discovering columns. One can even hypothesise that his early

interest in cantilevers came about because of his determination to avoid columns. (Donald Hoffmann has put forward this view.) When, however, he was confronted with a client whose warehouse had to contain bags of cement, he confronted a floor load that was very substantial in terms of pounds per square foot. For the first time he had to concentrate on the column rather than the slab.²⁰

It is instructive, I think, to contrast Wright's attitude to the column with that of Auguste Perret, the major exponent of traditional French classicism in concrete. As Peter Collins pointed out, Perret began his architecture with an analysis of the nature and function of the column. It was '... the element in his vocabulary to which he attached the most importance.'²¹ In another important passage Collins wrote:

'August Perret liked columns, and proliferated them with all the enthusiasm of the architects of the past. It was not only the inherent structural dignity

of the column itself which captured his imagination but the powerful emotional effect created by receding ranks of columns, and the optical function fulfilled by such rhythmic sequences in creating an awareness of scale beyond the effective bounds of stereoscopic sight. However much the Renaissance principles of perspective might be outmoded as a means of pictorial representation, the abiding reality of its laws as a means of apprehending spatial relationships seemed to him incontestable, and instead of diminishing or camouflaging his structural supports, he sought every means at his disposal to isolate them in space, and make their rhythm provide the dominant unifying element of his designs.²²

If one studies the nave at Perret's great church of Le Raincy of 1925 (Fig. 20), what Perret was driving at is absolutely clear. It is the precise opposite of everything Frank Lloyd Wright stood for.

In 1929 Francis Onderdonk published *The Ferro-Concrete Style*. This volume is a comprehensive but confused summary of everything that had been achieved in reinforced concrete up to that time. We know that Wright was familiar with it because he wrote to the young Swiss architect Werner Moser on 25 July 1929 remarking that '... nearly everything to date is in this book. You ought to have it.'²³ In the same letter he stated his appreciation for the church and tower of the Antoniuskirche in Basel by Karl Moser, Werner's father. These structures are shown on pp. 239–241 of Onderdonk (Figs 21 and 22). It is interesting to note that the vertical supports are square in plan. The design must have been congenial to Wright.



Figure 20. Nave, Notre Dame de Raincy, Auguste Perret, 1924–25

On p. 223 Onderdonk illustrated Maillart's Federal Grain Warehouse of 1910 in Altdorf, with its beautiful capitals and beamless ceiling (Fig. 23). It is hard to escape the conclusion that Wright was familiar with Maillart's improved version of the flat slab by the late 1920s, if not earlier.

He might indeed have known of it through the agency of Moser, who was in his studio 1924–27, and in my view this is highly probable. Maillart had published his comparison of the American slab as developed by Turner and his own more sophisticated version in a paper entitled 'On the develop-

Figure 21. Antoniuskirche, Basle. Karl Moser, 1926. (from Onderdonk, *The Ferro-Concrete Style*)



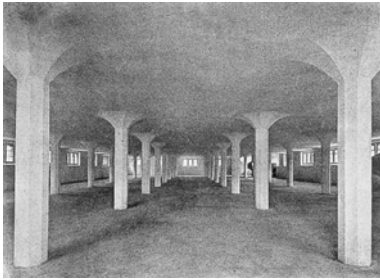
Figure 22. Nave of Antoniuskirche. (from Onderdonk, *The Ferro-Concrete Style*)



ment of the beamless ceiling in Switzerland and America' in the *Schweizerische Bauzeitung* of 22 May 1926. This was the same periodical that, in 1911, had published H.P. Berlage's two important articles on his American journey, that had played a major role in bringing Wright to the attention of European architects. It is probably worthwhile to point out here that in 1926 Wright had almost no architectural work in the office and plenty of time for reading. And in Moser he had a gifted student and lifelong admirer who was extremely familiar with European developments. Maillart had in fact already worked with Moser's father in Switzerland.

It can safely be presumed that the younger Moser was familiar with Maillart's achievements in both buildings and bridges.

Let us suppose that the *Schweizerische Bauzeitung* of 22 May 1926 arrived at Taliesin, and that Wright asked the young Moser for a translation. Moser would have scanned it and replied that the piece had been done at the request of the editors to clarify discussion that arose at an exhibition of industrial and engineering structures at the Zurich Kunstgewerbemuseum the preceding February. Apparently a certain number of executed American projects were shown. Issues of priority and the



ancient argument of beauty versus utility were raised. The editors therefore asked Robert Maillart for an explanatory article, and appended to his essay a series of illustrations which showed structures built according to his designs.

Maillart began by commenting that when concrete first emerged as a possibility for long-span structures the engineer treated it as though it were wood or steel. He conceived of it only in terms of joists, columns, and beams. (In some ways he sounds like Wright.) However, there were possibilities of reinforcing slabs in a crosswise manner that could distribute bending stresses in any direction, not only in the two directions of reinforcement. This situation led Maillart to conduct two remarkable series of tests at Zurich. Those experiments resulted in a knowledge of the fundamental properties of slabs, which Maillart turned to good account. Like the Americans he patented his system, and in the years up to the First World War did a great deal of building throughout Europe. His first building with the beamless floor slab was a warehouse at Giesshubel, Switzerland of 1910. It

is still giving good service today. This achievement of Maillart was twofold: he understood the behaviour of the slab more completely than his American contemporaries, and he gave it a more elegant expression. With regard to the first consideration, David Billington has remarked that Walter Lord, the American engineer who made early efforts to analyse the slab, actually measured the wrong things in his experiments, thereby creating great difficulties in the development of a code for concrete construction in the United States.²⁴ Maillart understood the need to measure deflection in the system as a whole. And every element in the Maillart slab was designed with an elegance far beyond what was customary in America. Maillart's 1926 paper was illustrated with drawings that compared his system with that of the American C.A.P. Turner, whose 1910 publication was his reference. His illustration showed that his slab was both more economical and more refined (Fig. 24). It will be seen that the column capital has a gently flaring form, which could become extremely elegant. Maillart summarised his criticism of Turner in the following language:

'A form arrived at in this manner will never satisfy the constructive thinking and feeling engineer. He immediately sees that the building material outside the dotted line has no reason for its existence but only disturbs the natural flow of forces because the concave corners always give rise to troublesome stresses. And so the American design is more costly than the rounded form not only on account of the material necessary but also because of the difficulty in shuttering. It is easy therefore to predict that the

Figure 23. Federal Grain Warehouse, Altdorf, Switzerland, Robert Maillart (from Onderdonk *The Ferro-Concrete Style*).

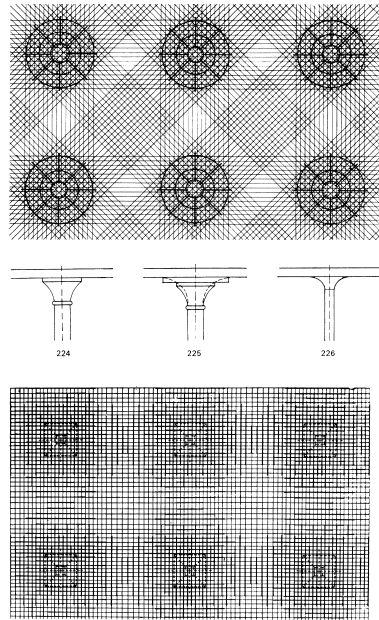
Figure 24. Comparative drawing of Turner and Maillart systems. (from *Zur Entwicklung*)

American form of column head will yield to the more rational and beautiful European design.²⁵

Whether or not Wright was familiar with Maillart's paper we cannot say for certain, but it is clear that the publication was aimed at the Turner system and its competitors, one of which Wright had used at Richland Center. Maillart had demonstrated that there was no need for the elaborate steelwork of the Barton system. Diagonal reinforcements did not have to pass over point supports, and so there was no need for the drop panel so characteristic of American construction. Maillart omitted everything that was non-functional, and made the slab into a horizontal platform that formed a monolithic body and resisted all stresses and strains within the structure.

As provocative as Maillart's own article was the appendix supplied by the editors of the *Schweizerische Bauzeitung*. It showed Maillart's work at the railroad station in Chiasso, Switzerland, a warehouse at St Petersburg (1912), a box factory at Lancey (1913–14), a spinning mill at Barcelona (1924), and a cable factory at Villanueva (Figures 25–27). In all of these structures the columns were slender, elegant, and refined. The capitals took a variety of forms. Those at Barcelona were eccentrically loaded. That factory was top-lit – rather suggestive for an architect who would later treat the great workroom at Racine in the same way. These illustrations would have come as a revelation to Wright, who had long been troubled by the clumsiness inherent in the American system.

So far we have been discussing only buildings and structural systems. But Wright was an archi-



tect whose sense of form permitted him to design all kinds of objects other than buildings: tables, chairs, fabrics, magazine covers, and glassware are only a sample of the problems that he attempted. In my mind the most compelling argument for the impact of Maillart is probably a glass design of 1930. For several years P.M. Cochius, managing director of the Leerdam firm, had wanted Wright to design a dinner service for his firm. In the

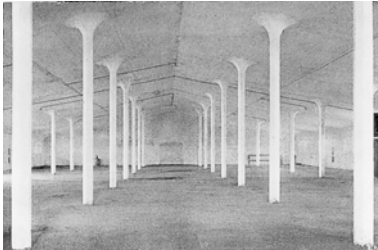
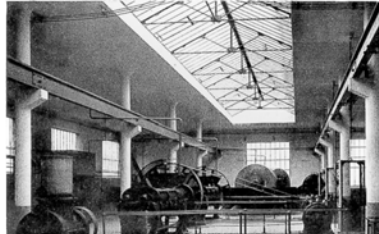
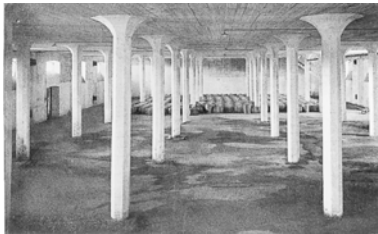


Figure 25. Warehouse at St. Petersburg, 1912. (appendix to Maillart article, *Zur Entwicklung*)

Figure 26. Box factory at Lancy, France, 1913–14. (appendix to Maillart article, *Zur Entwicklung*)

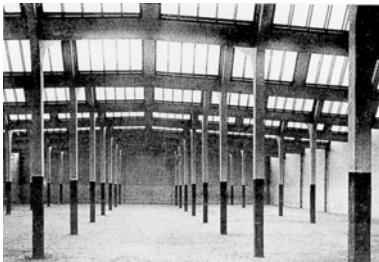
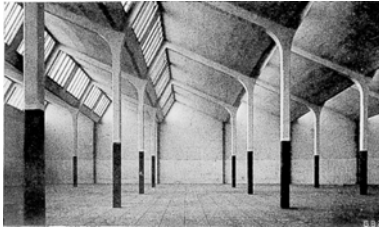


autumn of 1928 Cochius and Wright met in New York, and the architect agreed to design a set of crystal glassware and a dinner service that could be produced commercially in the Netherlands. Ultimately the glassware drawings comprised 16 pieces in plan and elevation, including glasses for wine, cognac, champagne, and sherry, a finger bowl, and a bread and butter plate. The commission is understandable in the light of two considerations: thanks to the sumptuous publication of his work in the *Wendingen* edition of 1925, Wright was undoubtedly better known in the Netherlands than in any other country of Europe; and the Leerdam Company had a long tradition of

employing architects as designers. Among those who had previously been commissioned were Hendrik Berlage and K.P.C. De Bazel. And Berlage, who was still active, had an enormous respect for Wright. So the decision to seek him out was entirely in keeping with company tradition.

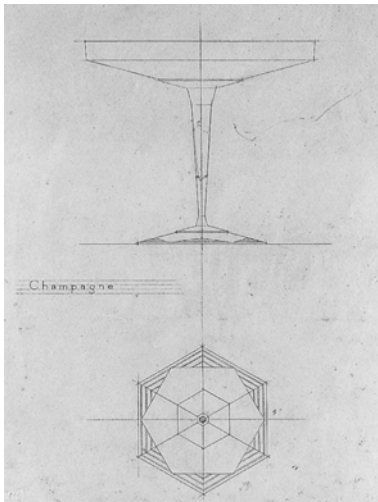
Once again Wright demonstrated a cavalier attitude towards the nature of his material, combined with a sense that if a job was not possible at present, it could be accomplished at some point in the future. Johan Ambaum, former curator of the Leerdam Museum, points out that Wright's designs could not be executed because glass-blowing techniques could not be applied.

Figure 27. Spinning mill at Barcelona, 1924. (appendix to Maillart article, *Zur Entwicklung*)



(Cochius advised Wright to go to Corning to study glass fabrication, but there is no record of a visit.) And so, from the original designs only the vase was ever made. Three examples remain: one at Leerdam, one at the Gementemuseum in the Hague, and one at Taliesin. But it is important to note that the technology of glass production has evolved so that it is perfectly possible to produce the candlesticks. Tiffany has the American rights to the design, and they are a popular item. If we compare Wright's drawing for the champagne glass (Fig. 28) with an analysis of the Maillart system (Fig. 29), the similarity is obvious. The drawing is especially significant because it clearly demonstrates Wright's development of two ideas that preoccupied him during his entire career: nature and geometry. Wright thought of his form in the champagne glass as derived from the *hemerocallis*, a kind of lily, though he must also have been aware of its source in Maillart's buildings. And he gave the glass a hexagonal base, foreshadowing the module in the Hanna house of 1936–37.²⁶

The *Capitol Journal* project of 1931 again presented Wright with a project that dictated a slab and column design; this time he was ready to improve on the already elegant Maillart column. This edifice was to be the headquarters for a newspaper in Salem, Oregon. The major structural consideration, as Jonathan Lipman has pointed out, was to isolate the noise and vibrations produced by the printing presses: hence the introduction of the downward-tapering columns set in metal shoes to prevent the vibrations from being conducted upwards. Because of the Depression the project was not carried through, but a drawing in the Taliesin



Archives shows that the idea of the dendriform (or hemerocallis) column was already fully worked out in principle (Fig. 30). It also, however, carries the designation 'mushroom' – traditional in flat slab construction. And it is important to note that the column connections to each other and the shaft tapering downwards to meet the ground at its weakest point are suggestive of connections that do not carry moments. They are, in fact, as close to 'hinges' as it is possible to go in monolithic concrete construction. Professor Robert Darvas writes:

'If you look at them in that light, they seem to form a series of "3-hinged bents" connected in

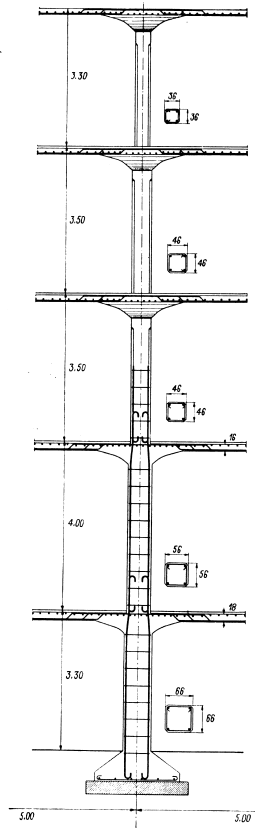
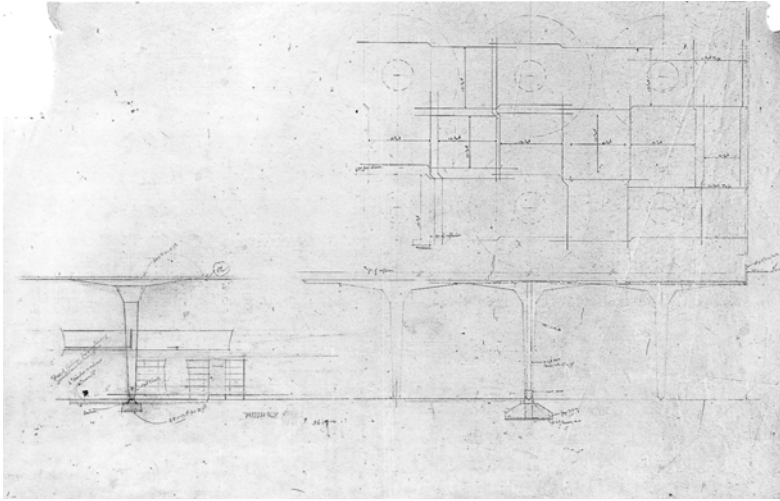


Figure 28. Drawing of champagne glass for Leerdam. (source: Taliesin Archives)

Figure 29. Maillart system (source: Max Bill, Robert Maillart)

Figure 30. Drawing of column for Salem *Capitol Journal* project. Frank Lloyd Wright, 1931. (Taliesin Archives)



rows in both directions. Now the 3-hinged bent is very much a statically determinate structure, one of the basic bent forms that can be solved without resorting to statically indeterminate analysis . . . the largest moments will be at the intersection of the mushrooms and their stems i.e. the columns. So the form, while truly artistic and beautiful, naturally follows the statics of the 3-hinged bent and the resulting moments thereof.²⁷

It is important to note that Wright conceived of this form by himself without the aid of any engineer. It is perhaps the best example we have of his own engineering gifts.

The idea of a series of columns conceived as three-hinged bents came to full maturity in the famous great work room at the Johnson Wax Headquarters (Racine, 1939). The requirements of the space of the great workroom lent themselves to a solution very similar to that of the *Capitol Journal* project. Let us begin with the famous presentation drawing (Fig. 31). The proposed structure closely resembles that of the earlier work, but there is a crucial difference: the column is partially hollow. This hollowness can have had only one purpose. It saved weight and thereby enabled Wright to have only a 9 in (225 mm) diameter base. The same reasoning may apply to the hollowness of the calyx and the petals.

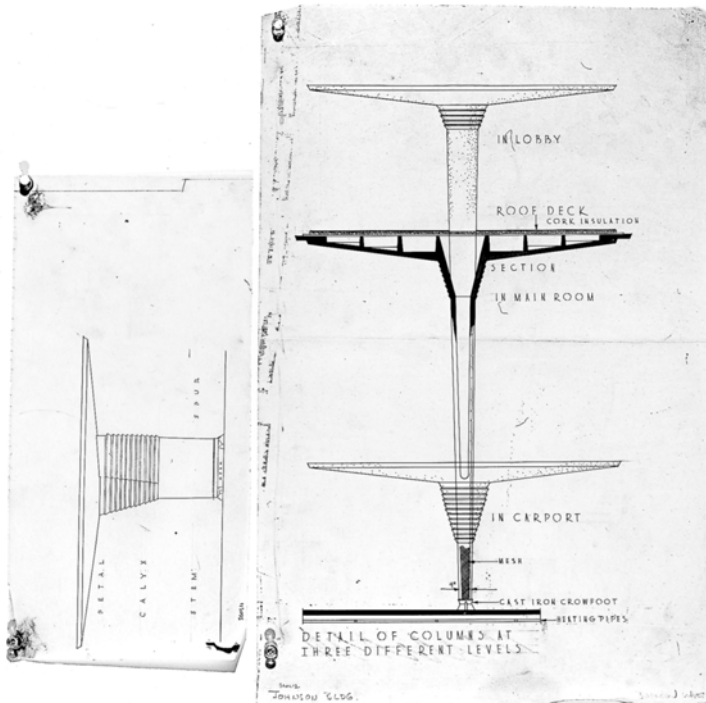


Figure 31. Presentation drawing for column, Johnson Wax Building, Racine. (Talliesin Archives)

The petals are cantilever ribs with dish-shaped circular plates underneath. The ribs are about 2 ft (600 mm) deep at the point of intersection with the calyx, certainly ample to carry the bending. There is no earthly reason to go to this trouble and considerable expense other than weight saving.

The pipe section of the slender column did not much reduce its buckling strength when compared with a solid section of the same diameter. With a 9 in base diameter, the available cross-sectional area governed the overall carrying capacity. Discounting the problem of slenderness, and looking at the column purely from the point of view of strength, the available total strength was 63.6 in^2 area times the 6000 lbf/in^2 specified ultimate strength reduced by a factor of 4 as was common practice in concrete design at that time. The essential calculation is thus $63.6 \times 1500 = 95400 \text{ lb}$ (43300 kg). Since 12000 lb (5440 kg) were assigned to the snow load, that left only about 83000 lb (37650 kg) for the weight of the structure. So Wright and his engineers had to husband the weight of the concrete very carefully.

The foregoing paragraphs differ somewhat from the customary interpretation of the column system at the Johnson Wax building. The columns were not shells or statically indeterminate structures. By definition shells are structures in which the thickness is very small compared with all other dimensions. This is not our case here. Even near the top, under the calyx, where the stems widen to about 2 ft (600 mm) in diameter, a 3.5 in (89 mm) thickness is considerable. We suggest that instead of being a shell, the stem may be thought of as a tapered pipe column. Carl Condit is correct in

pointing out that the columns and their interconnecting beams do form a continuous multi-support rigid frame. So far so good. But he continues: '... the resulting absence of bending in the column makes possible the use of an extremely narrow, virtually hinged bearing at the column foot.'²⁸ With all due respect, Professor Condit misunderstood the system. The whole design concept is to provide hinges at the base. In the mid-1930s engineers were generally afraid to have base connections that were 'undefined'. Wright, Peters, and Glickman, however, understood that narrowing the column to a point ensured that the structure would work according to the model assumed in their calculations. Having a hinge at the base, of course, does not make a column free of bending elsewhere in its length. But if the column's tributary area is loaded in a centrally symmetrical way, there will be no bending in the column at all. Because of the continuity and the unavoidable differences in loading conditions and their distribution, there will be bending moments in the columns, but these diminish to virtually zero at the base.

In short, the simple modelling, most probably used by Peters, is that of a series of three-hinged arches. This modelling was certainly suggested, but not worked out in detail, in the 1931 project for the Salem *Capitol Journal*. At Racine the small stiffness of the column bases and the deliberately small sections of the ribs connecting the petals qualify the system for the simplifying assumption of 'perfect' hinges. These would make the overall system stable and statically determinate, enabling the designer to get a reasonable handle on the

flow of forces and provide sufficient strength at each point to satisfy the forces present at those sections. The assumption of a statically indeterminate frame thus became unnecessary. The components within the structure – that is, a pipe column and a circular plate – were well described in the engineering literature at least a decade before the design of the Racine building. And, as we have previously remarked, Wright had plenty of time to read that literature, and in Peters he had an engineer who was also familiar with it. So it is not really surprising that Peters recalled that Wright drew the columns and specified their dimensions: there was some adjustment in the thickness of the petals, but the stems were built ‘... precisely as Wright had intuitively drawn them.’²⁹

Here is the place to enter a gentle demurrer to the general characterisation of the columns as ‘dendriform’. Numerous scholars and historians, beginning with Wright, have likened the Racine columns to trees. The difficulty is that trees do not stand on point supports. They generally get wider and stronger near the ground, and act as cantilever structures. Hence the columns are not trees. The overall effect for the casual observer may resemble a forest canopy, but this canopy rests on supports that are not very tree-like (Fig. 32).

Of course there remains one extremely provocative query about the columns: where did Wright get the idea of tapering his columns to a narrow base? This is an unusual practice in twentieth-century architecture. One finds it occasionally, as in Auguste Perret’s columns at Le Havre from a later date. A deconstructionist might argue that in the course of his examination of the literature on

concrete he ran across something like this photograph of 1918 (Fig. 33). It shows the space around a column during a test, and it is a provocative instance of photographic distortion. If this were indeed the case, we would have an interesting example of an architect seizing upon photographic error and using it to push back the limits of the structural art. It would be an episode akin to the deliberate misreading of text that is so central to the theory of the literary deconstructivists. It is a possibility.

But we do not think that it was capriciousness or the misreading of a photograph that caused Wright to adopt an inverse taper for his columns at Racine. Throughout his career he was an architect who thought almost entirely in terms of form. He began with an interest in slabs as enclosing and roofing elements. In a certain sense the column with its mushroom-shaped capital, as in the system of C.A.P. Turner and his American contemporaries, was a necessary evil. At the Richland Center warehouse he altered the shapes of his capitals to make them closer to the kind of forms that he desired, but he did not alter the shaft of the columns. In the Salem *Capitol Journal* project he proposed for the first time the narrow base that was his greatest innovation. It displayed both structural good sense and aesthetic sensibility. The idea came to fruition at Racine. Concerning the columns there Professor Grant Hildebrand notes that

‘... they could have been appropriately tapered in the more conventional way if Wright had envisioned them as being at one with the floor, rising, as it were like tree trunks from the forest floor. In

Figure 32. Great
workroom, Johnson Wax
Building. (photograph by
Jonathan Lipman)



that case, both visually and structurally the pad would have been perched on the top of the mast. Clearly, though, Wright envisioned the shaft and the pad as a unit, acting as a single piece coming to rest on the floor rather than rising from it – the cast iron crowsfoot makes that clear – and in that case both structurally and visually one wants rigidity where shaft and pad meet: hence the inverse taper is appropriate on all counts. (And incidentally, these

are the only two possibilities. A cigar-shaped column, with delicate connections at both top and bottom, would offer no lateral stability and thus would collapse like placing cards perched on toothpicks. You can easily grasp the two viable possibilities by imagining a number of funnels set bell downward, on strong sticks embedded in clay, with cardboard on top, perfectly stable – or, as Wright did it, a number of funnels set bell upward with



lips taped or glued together, also perfectly stable and considerably more innovative.) And also – and this may well be an important point – the second option yields a skylighting as a natural – and organic? – consequence of the structural concept – and surely this sense of a natural and inevitable relationship of structure and light is very much what strikes one as the beauty and wholeness of the idea.³⁰

Thus the inverse taper for the columns at Racine was a combination of structural good sense and aesthetic sensibility.

Wright's interest in dendriform construction did not end with the Johnson Wax Administration Building. In late May 1948 he visited Louisville to lecture at the Playhouse on the University of Louisville campus, and the following morning had breakfast with Mayor Charles Farnsley and Professor Walter Creese, then teaching at the University. Apparently the trio got along famously. Wright started to sketch unbuilt projects on the

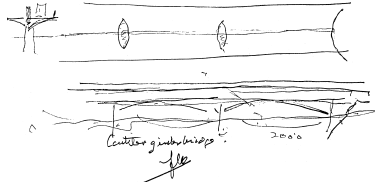


Figure 33. Photograph of 1918 column in *Built by the Leonard Construction Co.*

Figure 34. Xerox from May 1948 drawing on menu. (Frank Lloyd Wright)

backs of menus. Among his drawings was a bridge that he hoped to build over a river in Wisconsin (Fig. 34). The state highway department would not let him carry it through, but he was very fond of the idea. Again the lily pad columns are unmistakable.³¹

Wright often said that the sources of his architectural design were in the natural world. And there is no reason to doubt his statements. But it is equally true that his sensibilities collided with an ancient predilection in Western architecture for the column as an expressive element. In his early years he worked primarily with slabs, and at Unity Temple used them masterfully. A few years later he became aware of the improved slab and column system of C.A.P. Turner. Indeed, he himself proposed slab construction in his 1912 project for the *San Francisco Call*, and he used the Barton system in his A.D. German warehouse of 1915. During the 1920s his practice turned on other issues, but he became aware of the achievements of Maillart and Moser, both of whom worked primarily in concrete. The Racine buildings for Johnson Wax stand as a triumphant vindication of his thinking about the role of the concrete column in architecture.

Notes and references

1. Frank Lloyd Wright, *An Autobiography* (London, Faber and Faber Ltd 1946), p. 139.
2. Frank Lloyd Wright, *In the Cause of Architecture: Essays by Frank Lloyd Wright for Architectural Record (1908–1952)* (New York, 1975), p. 205.
3. *Ibid.* p. 208
4. Wright's attitude towards structure is brilliantly discussed in Grant Hildebrand, *The Wright Space: Pattern and Meaning in Frank Lloyd Wright's Houses* (Seattle, University of Washington Press, 1991), pp. 176–7. In a communication to me of 1 July 1996 Professor Emory Kemp remarks on the deflection now visible at Fallingwater (1937).
5. Frank Lloyd Wright, 'The Village Bank Series', *The Brickbuilder*, 10(8) August 1901, 161.
6. H.R. Hitchcock dated the Yahara Boat Club project at 1902: *In the Nature of Materials* (New York, 1942), p. 49. In a remarkable piece of scholarly detective work Dr Jack Holzhuetter of the Wisconsin Historical Society has demonstrated that the Yahara Boat Club project must be dated at 1905, almost simultaneously with Unity Temple: 'Cudworth Beye, Frank Lloyd Wright and the Yahara River Boathouse', *Wisconsin Magazine of History* (Spring 1989), 163–96.
7. Frank Lloyd Wright, *Studies and Executed Buildings* (New York, Rizzoli, 1986), foreword by Vincent Scully, p. 20. This volume is a convenient reproduction of the famous Wasmuth *Ausgeführte Bauten und Entwürfe* folio of 1910.
8. Donald Hoffmann, *Understanding Frank Lloyd Wright's Architecture* (New York, 1995), pp. 11–47.
9. Wright, *An Autobiography*, p. 143.
10. Letter from Professor Sidney K. Robinson, 18 November 1996.
11. Frank Lloyd Wright, 'A fireproof house for \$5,000', *Ladies Home Journal* (April 1907).
12. Curtis Besinger, *Working for Mr Wright: What It Was Like* (Cambridge, Cambridge University Press, 1995), p. 206.
13. Professor Emory Kemp, personal communication, 1 July 1996.
14. Robert L. Sweeney, *Wright in Hollywood: Visions of a New Architecture* (Cambridge, MA, The MIT Press, 1994), p. 209.
15. H. Allen Brooks, *The Prairie School: Mid-West Contemporaries of Frank Lloyd Wright* (New York, 1976), p. 195.
16. Margaret Scott, *Frank Lloyd Wright's Warehouse in Richland Center* (Richland Center, 1986), p. 106.
17. Walter C. Edge, *Flat Slab Construction*, p. 462. Edge's article in *The Concrete Engineers Handbook* (New York, 1918) is an excellent summary of what was known about flat slab construction in the United States by 1918.
18. Francis M. Barton was granted US Patent #1,155,461 on 15 October 1915. His application was filed 24 June 1907. I am unable to determine the reason for the long delay. Of course a good deal of work could have been done with the system while the patent was pending.
19. Scott, *Frank Lloyd Wright's Warehouse in Richland Center*, pp. 121–2.
20. From these remarks I must exempt certain early works such as the porch on the Blossom House

- (Chicago, 1892) and the arcade in the Winslow House (River Forest, 1893). The problem of the column may even account for Wright's difficulties with furniture. A chair leg is, after all, necessarily a kind of column.
21. Peter Collins, *Concrete: The Vision of a New Architecture* (New York, 1959), p. 200.
 22. *Ibid.* p. 201.
 23. Frank Lloyd Wright to Werner Moser, 25 July 1929, in Frank Lloyd Wright, *Letters to Architects*, ed. Bruce Brooks Pfeiffer (Fresno, CA, 1985), p. 76.
 24. David S. Billington, *Robert Maillart's Bridges: The Art of Engineering* (Princeton, 1979), p. 57. Billington notes that Maillart derived the correct amount and location of reinforcement by measuring the vertical bending of the overall slab. Lord measured the strain on individual reinforcing bars and obtained faulty results because he failed to include the tension taken by the concrete. Maillart observed the behaviour of the whole system: 'Den konstruktiv denkenden und fühlenden ingenieur kann aber die so gewonnene Form nicht befriedigen; er sieht ohne weiteres ein, dass das ausserhalb der punktierten Linie liegende Baumaterial keinen Daseinszweck hat und das kalare Kräfteispiel nur stören kann, denn einspringende Kanten geben immer Anlass zu unwillkommenen Spannungen. Dabei stellt sich die amerikanische Anordnung nicht nur infolge des grössern Materialaufwandes, sondern auch der schwierigen Schalung wegen teurer als der gerundete Übergang.'
 25. Robert Maillart, 'Zur Entwicklung der unterzungenen Decke in der Schweiz und in Amerika', *Schweizerische Bauzeitung* (22 May 1926), 263–5. This article is available in a good English translation in Max Bill, *Robert Maillart: Bridges and Constructions*, 3rd edn (New York, 1969), pp. 165–6. Bill, however, added certain diagrams that do not appear in the original article, and omitted the somewhat chauvinistic last paragraph: 'Es ist deshalb vorauszusehen, dass das amerikanische Vierbahnsystem und die ebenfalls aus Amerika stammende Pfellerkopf-Ausbildung der rationelleren und schöneren "europäischen" Ausführungsart weichen wird.' And he did not show all the illustrations that were added by the editors in their illuminating appendix to the original article.
 26. For the Leerdam episode see David Hanks, *The Decorative Designs of Frank Lloyd Wright* (New York, E. P. Dutton 1979), pp. 185–6. A more comprehensive account is Johan Ambaum, 'Ontwerpen van Frank Lloyd Wright voor de glasfabrick Leerdam', *Jong Holland, tijdschrift voor beeldende kunst en vormgeving in Nederland na 1850* (Introductionnummer November 1984), 35–51.
 27. For the best description of the *Capitol Journal* project see Jonathan Lipman, *Frank Lloyd Wright and the Johnson Wax Buildings* (New York, 1986), pp. 9–11. Professor Robert Darvas very kindly communicated his analysis to me in a letter of 4 February 1993. Recently Professor Donald Leslie Johnson has published 'Frank Lloyd Wright's design for the *Capitol Journal*, Salem, Oregon, 1932' in *JSAH*, LV (March

1996). My criticisms of that article are published in a letter to the editor of the same periodical in the October 1996 issue.

28. Carl Condit, *American Building Art: the Twentieth Century* (New York, Oxford University Press, 1961), p. 174.
29. Lipman, *Frank Lloyd Wright*, p. 56.
30. Grant Hildebrand to Leonard Eaton, 6 February 1990. As so often in his practice, Wright took a good idea, improved on it, and did not

acknowledge his source. However, in the list of engineers whom Wright included as 'collaborators' in his presentation of the mile-high skyscraper in 1956 he mentioned Pier Luigi Nervi of Italy, Eduardo Torroja of Spain – and Maillart of Switzerland. Wright's enthusiasm for Swiss bridges is known. We suggest that it extended to Maillart's elegant flat slab systems.

31. Personal communication, Walter Creese to Leonard Eaton, 18 April 1992.

Berlage's Beurs – concept and method

Jan Molema

In the eighteenth century Dutch architecture still flourished, but it went into deep decline in the early nineteenth century. It was only in the second half of that century that building in the Netherlands made a fresh start. It was with the generation of Berlage, and his somewhat younger colleagues, that the new architecture began to reach international attention.

The Exchange building in Amsterdam became the touchstone for the new architecture. Built between 1898 and 1903 the development of its design shows in plan, section and perspective how, little by little, the definition of a new architecture began. In this paper various elements of the building which require deeper enquiry than has been accorded until recently, are investigated. First, the riddle of the basic measures (the vertical and horizontal modules) related to brick sizes and bonds and the proportional system of the Beurs in plan, section and elevation are analysed. This is followed by an investigation into why Berlage changed the form of the trusses of the main hall in the period between the production of the specification drawings and the start of the construction works.

The preliminary studies

Although the preliminary studies for Berlage's Beurs, or Stock Exchange, have been extensively written about¹ one of the most remarkable factors is that any Exchange in Amsterdam was expected to be built on the bed of the (former) Amstel river (Fig. 1).^{2,3} Berlage knew very well the history of the Beurs's two predecessors and the settlement that had occurred in both cases.⁴ He mentioned this in his well-known Beurs lecture given on April 1, 1898, for his colleagues at the *Architectura et Amicitia* club in Amsterdam when presenting the plans for the Stock Exchange.⁵ Yet he built the Beurs in the same boggy area. Did he therefore regard this as a challenge?⁶ It is of interest to know whether, and if so how, Berlage reacted above the level of the pile caps to the subsoil conditions and

whether the structure of the building, as we perceive it, adapted to the specific character of the subsoil.

At other levels also, one understands the prehistory of the Beurs with difficulty. Why did Berlage receive the commission having come second in the competition? (Figs. 2 and 3.) On the basis of what data did he start his design? Why, for example, was he obliged to use a ground plan conceived by A. W. Weissman, the city architect, in 1887? (Figs. 4, 5 and 6.) What other ideas from Weissman's design did Berlage adopt? We do not know either what was the theoretical background for the geometry on which Berlage later laid such emphasis or the methods for static calculations known at the time. Had he mastered such techniques as the grapho-static method of Cremona (1871)? What did he

Figure 1. Perspective towards the east with the Central Station by Pierre Cuijpers in the distance (*Architectura*, no. 12, 1898).

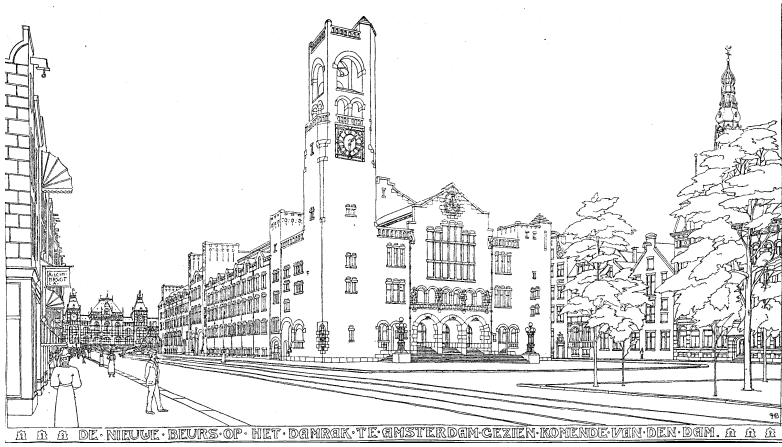


Figure 2. Second design for the new exchange in the international competition; watercolour by H.P. Berlage 1885 (in *Topografische Atlas van gemeente Amsterdam*).



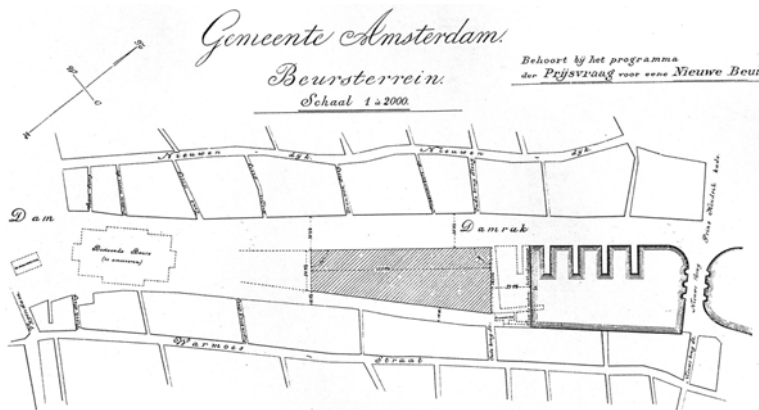


Figure 3. Situation as for the international competition in 1885.

To the left the Damsquare with the Zocher beurs to be removed; the water to the right is the last part of the Amstel river over which the Dam was built centuries ago. (*Bouwkundig Weekblad*, 5, 1885.)

know about new materials and their physical qualities? In the publications on Berlage, Gottfried Semper and Eugène Viollet-le-Duc have been mentioned frequently as Berlage's main theoretical sources and inspiration. But their views were based on knowledge developed before 1870. In 1895 their writings were in many respects superseded by new developments. Stability, for instance, was a notion the meaning of which had changed fundamentally in the third quarter of the nineteenth century. Empirical and theoretical research on materials had been developing rapidly and improvements in the iron industry led to the application of steel in the building trade. This knowledge is absent from the writings of Berlage's instructors and from his own writings, so it is not possible to trace whether Berlage had studied other theoreticians.

Berlage's theories

In his famous lecture in Zürich (1907), of which the text was published in 1908 under the title *Grundlagen und Entwicklung der Architektur*, Berlage defines very precisely how one should look at a building before criticising it. He starts with a quotation: 'Time alters fashions . . . but that which is founded on geometry and real science will remain unalterable'. He continues:

Yet also I see Sheraton's motto as correct and dare to make it mine, right because it concerns a reflection about art, more precisely the art of building (. . .). I have come to the conviction that geometry, the mathematical science, for the making of artistic forms is not only the most profitable but even absolutely necessary.

Figure 4.
A.W. Weissman's project of 1894 for the refurbishment of the existing Zocher beurs; groundplan as suggested to Berlage. Weissman was the Amsterdam City Architect.

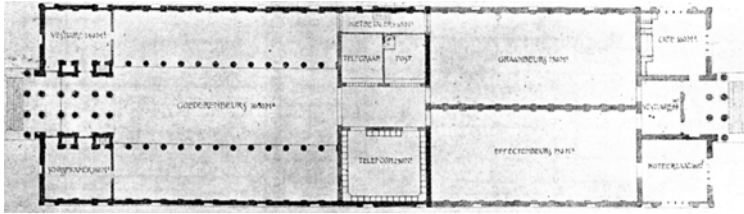


Figure 5. Berlage's groundplan drawn for the city council meeting on October 7 1896. (Published in *Bouwkundig Weekblad*, 39, 1896.) As Weissman wrote to the City Council, the design is nearly the same as for the refurbishment of the existing Exchange as he himself had drawn it up on request of the City Council in 1894.

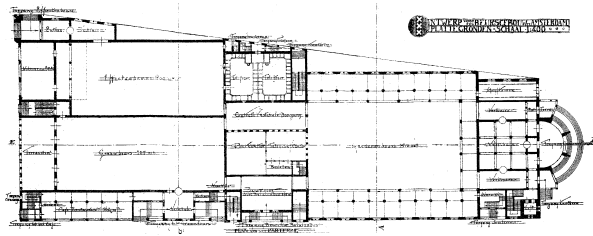
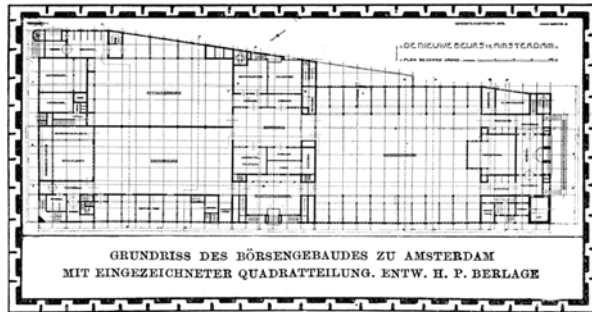


Figure 6. Groundplan as for the specification for bids and as published in Berlage's *Grondlagen und Entwicklung der Architektur* (Amsterdam, 1908) with dimensions and grid of 3.80 m x 3.80 m.



Evidently Berlage's lecture was influenced by theories concerning the coherence of the universe which had been developed contemporaneously:

And while now these shaping/creative/formative laws (*Gestaltung*) in the whole universe are of the same mathematical nature, that is where it concerns the bodily stereometric and where planes are concerned with the geometric.

Essential to an understanding of Berlage's work is what he said in the same lecture:

... you should at once investigate how it was made, that is with what consequence the forms have been applied. You have to make yourself clear with what talent the volumes concerned are brought in concordance with it. But not only that, you even have to admit also that the proportions have been applied with excellence and the decoration with great understanding and taste. All in all, you have to admit that the whole work shows an absolute entity in all its parts.

Typology

Many people gain the impression that the front façade of Berlage's Beurs is more appropriate for a church than anything else. What is an Exchange? Essentially it is a more or less covered or enclosed place where commerce takes place, frequently a sort of market without stalls, a place where people meet with only one aim – business. Until the late nineteenth century they were nothing more than (enclosed) courtyards. In Catalonia the *Llotja* was one of the most important building types in the city. They are identical, a rectangular space surrounded by a thin wall with large window openings and the

roof as a collection of opened umbrellas, vaults on pointed arches and spiralled pillars on a square grid, one or two entrances, floor just above street level. That is what exchanges in Barcelona, Valencia, Palma de Mallorca look like. They also display a significant, urban presence.

Berlage thus probably had a clear picture in his mind. The programme for the competition apparently supposed that the term 'beurs' was clear enough by itself. The literature about the Beurs repeatedly testifies to the double function which the building had to meet and which may be found in several locations in the building. The 'other' function (possibly the main function in the mind of Alderman Treub as representative of the local administration) was the provision, for large meetings of those who up until then as a group had been homeless, the labourers (movement), of a socialist manifestation hall, to be paid for by the exchange speculator.

The building mass

The Beurs appears quite massive because two sides and the roof structure can be viewed simultaneously. Seen from the south, omitting for the moment the roofs and towers, the building is one mass of about 140 × 35 × 14.25 metres, having a range of openings. But, though abundant, the openings do not break the massiveness of the building. The other two façades have a somewhat different aspect. It becomes evident that Berlage intended the exterior of the building to express the functions, rather than possible 'meanings'. The massiveness is dissolved into small volumes, according to their function, which blend well with the adjacent buildings at the

northern end. Berlage managed to manipulate the enormous bulk (of the programme) to the surrounding heights of the buildings, the functions and the proportional system.⁷

Proportions and measure

From his presentation drawings for the final project we can deduce how precisely Berlage was, in the end, working. The inserted module lines indicate exactly how the different parts of the building are related to each other and to the whole, and also where the material is going to be placed, for instance with the centre line coinciding with the modular grid. In Berlage's own words: 'The art of building is the art of composing precisely, such that from there on, a building which is not composed precisely, can not be described as a piece of art' (from *Seven lectures on the Art of Building*). Berlage discussed the importance of proportions in a building most extensively in his Zürich lectures, published in 1908, in which he rhetorically asked: 'Would designing on a certain geometrical system not be a great step forward? A method, with which several of the modern Dutch architects already are working?' He had evidently learned a lot during the design process.⁸

Choice of proportional system

There has been much discussion about the basic figure in the façades of the Beurs, the so-called Egyptian Triangle with the sides 8 (base) and $\sqrt{41}$ (oblique side) and height 5. Half of this triangle is the square-angled one with base 4 and vertical 5 (proportion 1:1.6). In this triangle the inclination of the one oblique side ($\sqrt{41}$) is important. We know that

in the traditional 'grachtenhuis' (canal house) the window panes have a diagonal under $\sim 50^\circ$ with the horizontal, which corresponds with the angle of the golden section. In Berlage's Beurs this angle is 52° , also rather near to the ideal of the Golden Section with a proportion of 1:1.618... The advantage of Berlage's system of proportion is, of course, that it works with full numbers, 8 and 5, in the two common directions, the horizontal and the vertical (Fig. 7).

On the other hand, Berlage worked with brick and calculated the height and width in courses and headers (so called *koppen*). The measures of the applied Waalformat being 11.2 and 6.25 cm ($\approx 9:5 = 1.8:1$). This means that only a multiple of the element can correspond with the Egyptian Triangle. Thus the question remains: how did he do it? It should be mentioned here that he used, vertically, 16 courses per metre and practically 9 headers per metre horizontally.

Berlage was quite clear in his Zürich lectures about his choice of the Egyptian Triangle (for example, p. 60 of *Grundlagen*). But far less clear is his reason for the basic module measure concerning which he only declared that it resulted after a long search, as the right module (p. 14 of *Grundlagen*). Neither did Berlage make any attempt to explain the double-square in his Beurs ground plan, although the use of it there is obvious.

Notes from historiography

In his *Dictionnaire Raisonné de l'Architecture Française*, Viollet-le-Duc proposes, under Proportion, three possible proportional triangles: '1) *le triangle isocèle rectangle*; 2) *le triangle que nous*

appelons isocèle Egyptien; 3) le triangle équilatéral ['1) the isosceles triangle; 2) the triangle known as the Egyptian triangle; 3) the equilateral triangle']. Viollet-le-Duc lends these triangles stability. The equilateral has the disadvantage of an indeterminate ($\sqrt{3}$) proportion between the width and the height of the triangle, unlike the two others. Berlage, probably after painstaking reading of *Proportion*, sought to conform his design to a system of 'symmétrie' = 'proportion', or in the French writer's words '*les rapports entre le tout et les parties, rapports logiques, nécessaires, et tels qu'ils satisfassent en même temps la raison et les yeux*' ['the relationship between all the elements, an essential, logical accord such that it satisfies the eye and the mind'].

In his 9th *Entretien sur l'Architecture*, Viollet-le-Duc examines extensively the theory of proportion. He explains the proportion of the Cheops pyramid and what this proportion exhibits, specifically the combination of the decimal and the duo decimal systems. He also suggests that the 'Egyptian triangle', since the building of the pyramids, has been applied many times in architecture, as in the Mosque of Amrou (Cairo, 641) and Amiens Cathedral (1218). The ratio 5:8, he writes (I, 408), satisfies the eye, which is as essential as satisfying reason (*raison*), the eye is not content with equal dimensions, demands difference in height, width and depth, but also, '*par des divisions . . . il facilitait les tracés*' ['through its divisions it facilitates the layout']. Berlage adopted this idea following some research. This research we can read in the diagonals which Berlage added to existing design drawings. While we find at first that these added

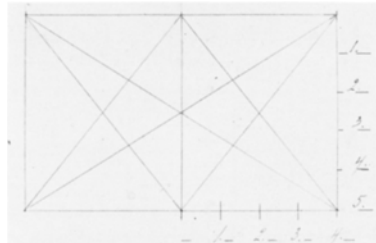


Figure 7. Diagram of proportions included on the drawing containing cross sections, which constitutes one of the contract documents dated 1898.

lines were drawn over the whole façade and even extend from it irregularly, Berlage in his later drawings starts these diagonals from the level of the ground floor while all that is drawn above this level is much more in accord with the system. By then he had made use of specially contrived wooden triangles, as mentioned in his Zürich lectures (Figs. 8, 9, 10 and 11).

Why did Berlage use this ordering system only above the interior floor level and not for the whole façade from street level upwards, in other words for all that is visible? Viollet-le-Duc writes that the systems of triangulation in the Middle Ages started from the interior, namely at the top of the column bases: '*La base AB du triangle inférieur ABC repose sur les bases des piliers de la nef, c'est toujours là le niveau qui sert de point de départ*' ['The base of the lower triangle ABC rests on the base of the pillars in the nave, which always serves as the datum']. He does not explain, sadly, what may have been the reason to start a system of proportion at such a height. Berlage's decision to start from the level of the ground floor makes more sense. Kromhout initiates his system at the same level and

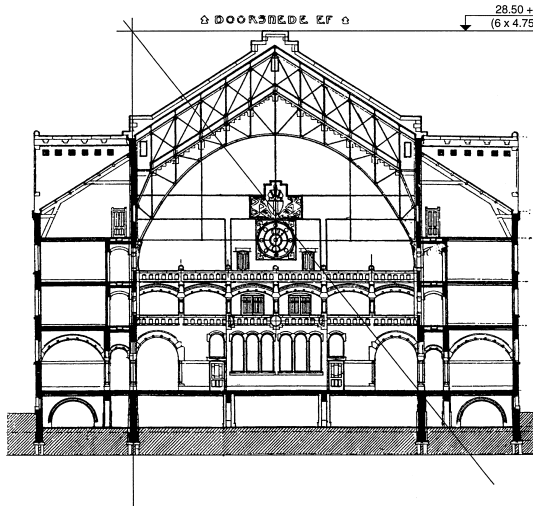
so did the Catalan architect Antonio Gaudí y Cornet.

Consideration of modules

The longer the span the more versatile the spaces become, but a space may be too big. In the Beurs we witness some wide spans which were not necessary *per se*, but originate in the pre-history of the building. The original exchange as a type existed in large, uncovered, secluded spaces surrounded by small covered offices in a gallery. In its essence the Beurs 'hall' therefore is a covered, secluded space, not a hall. Given the movement of people on the

floor, small spans with intervening columns would have been possible, but this was clearly not the wish of Berlage and his clients. On the one hand was the factual programme of the Beurs, covered spaces for large meetings of the growing labourers' movement; on the other there is the example of the Catalan *Llotja*, which has rather modest spans. There are also acoustic consequences in a large space, and this proved to be the case in the Beurs. In Berlage's Beurs (as in the former ones) the spaces around the courtyards are mostly restricted in their dimensions, the narrowest span being 3.80 metres, a quite normal size that can easily be covered by

Figure 8. Systemlines over cross section E-F, of the specification drawings with measures of height in multiples of 2.375 m (summit of façade f.i. = 6×4.75 m = 27.00 m relates with 6×3.80 m = 21.60 m or 0,5 length of main hall).



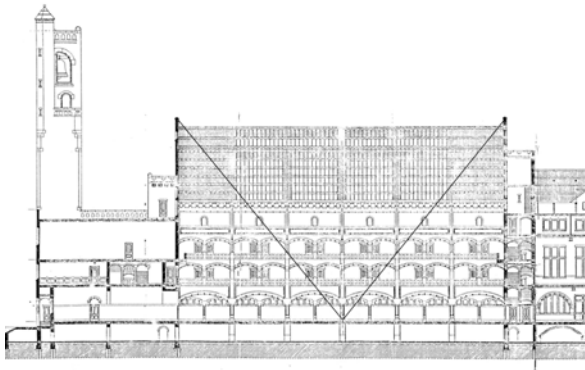


Figure 9. Section through main hall; with schematic lines by author indicating the proportions of the hall 8 : 5 (Author's scheme III).

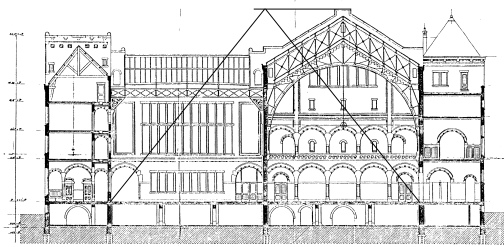


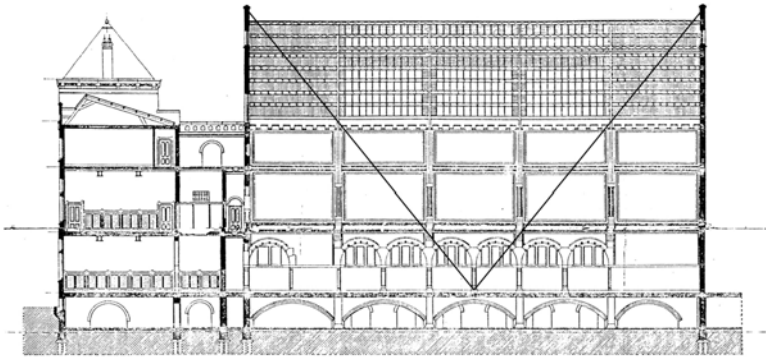
Figure 10. Cross section through the two small halls with schematic lines by author indicating the proportional system (Author's scheme IV).

traditional structures in iron or wood. As the walls are one brick thick, the span of 3.80 metres provides room widths of 3.60, 1.70 and 0.825 metres. From the available sources it is not clear what decided the dimension of 3.80 metres, but all in all the chosen measure turns out to be a logical consequence of rational considerations.

The rectangle 1:2 – the double or super square

In relevant literature, the rectangle 1:2 with a diagonal $\sqrt{5}$ has frequently been identified as ideal for ground plans. August Thiersch, for example, proved in his *Die proportionen in der Architektur in Handbuch der Architektur* (J. Durm a.o., Darmstadt, 1893) that many Greek temples have a ground plan

Figure 11. Section through one of the two small halls with lines by the author.



with this ideal proportion. Gaudí also repeatedly used this figure as a basis for his designs, in plan as well as in elevation. Although the Beurs ground plan, because of the given site, has a proportion of (nearly) 1:3, and thus is not a double square, it becomes obvious that Berlage used this basic figure of 1:2 repeatedly for the division of his ground plan. The three main halls all have the proportion 1:2, not including the side aisles; also the two groups of small rooms at each end of the main hall are set in a double square. The northern group of small rooms is an exception, although it forms a square together with the two small exchange halls and their side aisles. Berlage made his choice for the double square between 1896 and 1898, as a comparative analysis of the first design phase and the plans for the building specification confirm (Fig. 12).

Further explanation

While the measures of 190, 380, 237.5 and 475 cm and their multiples can already be found in the specification drawings (Specification nr 18) it is difficult to determine why he used these, and no other, measures. The following considerations probably contributed:

- the size of the smallest element to be used and of other standards, in our case the brick with Waalformat;
- repetitive space dimensions in accordance with specified functions;
- the general dimensions of the available site and their relative proportions, including heights as permitted by regulations.

As already observed, the applied brick in Waalformat does not fit in an Egyptian triangle. The smallest quantity of bricks necessary is 17 headers

and 19 courses – each prime numbers. The conclusion is simple; Berlage took the smallest ‘unit’ possible of whole headers and courses, starting from a header measurement of 11.2 cm and course dimension of 6.25 cm, both including the joint, using normal bricklaying methods, the standard of the Waalformat and the practical proportion of 5:8. The courses include a 1 cm joint, the vertical joint being 0.7 cm. 17 headers and 19 courses give 190 and 118.75 cm. The last measure appears rather awkward, but results in exactly 16 courses per 1.00 metre rise, normal bricklaying practice in the Netherlands. The 190 cm is, furthermore, not too difficult to use. In the Golden Section 118.75 cm would mean 192 cm length, while on the other hand 190 cm would give a height of 117.5 cm. Berlage’s choice seems to be a rational one.

It is obvious that Berlage introduced a maximum of modules of 3.80 metres on the given site. It also becomes clear, from a comparison with the design of 1896 (ground plan of the first phase)

that it was only between 1896 and 1898 that Berlage came to use this strict application of the 3.80×3.80 metre square module, adding the hall module of 1.90 metres for refinements in the plan. This also goes for the introduction of the double square which defined the plan in its ultimate version. By applying the double square Berlage defined the width of the middle part as 6×3.80 metres.

The ground plan of what M. Bock calls the second phase was remodelled on the base of a square module, which resulted in a slight displacement, also because Berlage had obviously decided at the same time to use the double square in plans (and sections) as much as possible. Apart from the already illustrated centre part we find this figure in the main space of the great hall, the two other halls and the part at Beursplein. The depth of the side aisles of the halls was defined at two modules of 3.80 metres, which defines these zones as the sum of double squares.

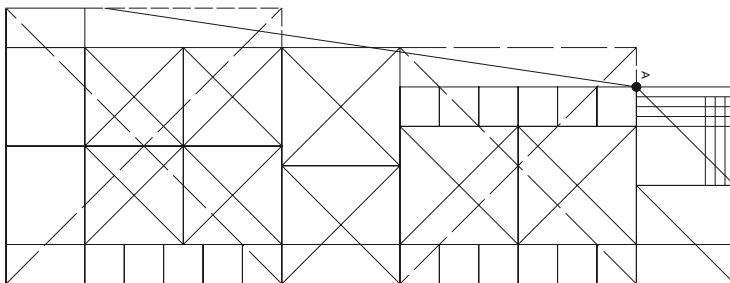


Figure 12. The executed groundplan in squares and double squares (Authors scheme I).

Apparently Berlage found it of paramount importance to retain the main hall, including the side aisles, untouched. Already in the first design phase, this space fitted precisely within the oblique back side of the building, while in the specification drawing the change in direction on that side coincides exactly with the southern corner of the goods exchange hall. The great hall has become extremely pure, even more so because of the perfect compatibility with the cross section, which is defined exactly by the Egyptian triangle, determined between the external walls and the ridge of the inner glass roof.

This led to the happy circumstance that the main hall could become 10 modules wide ($6 + 2 \times 2$). The length of that room became $2 \times 6 = 12$ modules. It follows that the middle part is 12×6 modules and the two smaller halls constitute 5×10 modules each and at each side 2 modules for the side aisles (one for each hall). The northern end of the building has a width of 14 modules and a depth of 4. But here we find that other considerations than proportional doctrine determined Berlage's decision, one aspect being the limits of the site, another the functions to be housed and a third the compositional aspect of the towers.

Beursplein façade

From measuring drawings and reasoning it appears that Berlage used the centre of the (main) tower as the measuring line for its height, a precedent established in other architects' work such as Kromhout's Hotel American (Amsterdam 1898–1900) (Fig. 13). The tower occupies 4 modules in width; the axis of the lower splits the Beursplein façade into 2 and 17

modules. From these 17 modules follows the height of the tower: $17 \times (190 \times 5/4) = 17 \times 237.5 = 4037.5$ cm (17 vertical modules). It is notable that Berlage chose to use the prime numbers 17 and 19 on a grand scale and that this has not been previously established and described. On the Damrak side, the height of the tower does not have an obvious, clear proportion with the façade, which may indicate the importance and the character that Berlage gave to each of the façades. On the other hand, in the centre of the Damrak façade we find the Egyptian triangle starting from the axes of the two towers of the middle section at floor level and their apex: *10 modules of 190 cm correspond with 10×237.5 cm = 23.75 metres* in height. The gutter level at Damrak, 6×237.5 cm, corresponds with 6 modules, which is a 1.5 'canalhouse' of which 6 fit in the major hall and 5 in the small ones. It follows that the large hall plays the most important role in defining the height of the Damrak façade, although the building regulations may also have had a significant influence.

Material composition

Bearing elements

The major bearing element of the Beurs is the massive brick wall. Berlage's master work was, thus, still substantially traditional after a half-century history of iron and steel structure development. The whole exterior of the Beurs, including the massive tower and all interior walls, were built with this most Dutch of materials. The walls, in reality very slender, are two, one, or half a brick thick and look very slim indeed in the sections of the building. The thicker walls (43.4 cm), from which one expects solidity and

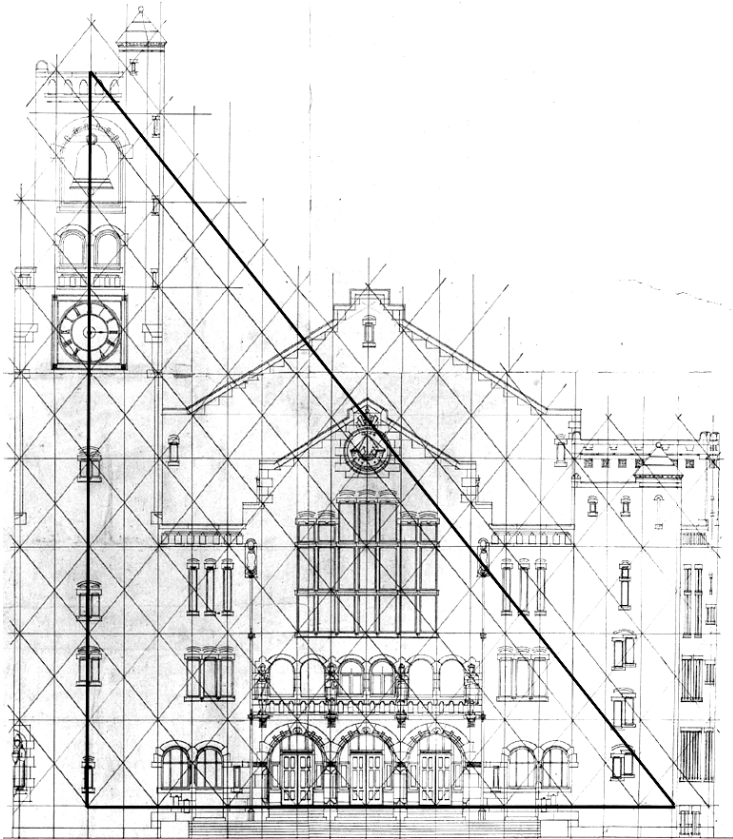


Figure 13. Façade at Beursplein as published in 1898 (Author's scheme V).

stability are, furthermore, highly perforated, particularly at those points where, due to increased vertical or horizontal loads, there should be a concentration of, or stronger, material. This airiness does not apply to the corner towers at Beursplein, which have a visual intensity, although there, also, the walls are thinner than would seem necessary to work as counterweight for the 'nave', as in many gothic churches. The arches in the brickwork, furthermore, seldom have the optimal form that would result from the loads they are intended to transmit either internally or externally. Courageous? Genial, bold *Formwillen*, or the result of ignorance?

From the repair history of the Beurs after 1904 one might conclude that it is the latter. Much has been written about Berlage's quest for 'purity' and 'rest' in his work.⁹ This quest became apparent in the gradual decrease in variation of form during the design process, the fewer forms the better it became. The purer result also transpired given fewer 'hidden' materials and, also, the 'right' material in the right place, meaning brickwork in the planes, including the arches, and stone as the stronger material in compression in locations where forces concentrate such as the springing of the arches where the forces are gathered and descend through the columns to the piled foundations. However the transition from brick to stone is very abrupt, which must result in either overloading the brickwork or under stressing the stone.

Berlage may imply rational procedures, but he did not always achieve that result. It is more instructive to see the Beurs as a kind of laboratory, a building in which research was continuously conducted, in the preparatory processes as well as during the construction itself.¹⁰

The documents of the committee which reported on the condition of the Beurs in 1906 make very clear that the building as a whole was poorly structured, although their proposals did not, in the end, improve the structure.¹¹ These proposals were intended to stiffen the building where they considered it to be necessary. But this was of little use since the foundation consisted of wooden piles which were only interconnected by means of a flexible wooden framework on which the brickwork of the walls is supported, and consequently lacks the stiffness of more stable subsoil conditions. To avoid cracks caused by movement of the foundations would require a more rigid substructure but, if this is not possible, then it would be better to make the building itself flexible in order to adjust to the subterranean conditions. Such was the case with traditional buildings, where the lime mortar of the brickwork allowed certain deformation without the danger of cracking. The report on the Beurs is striking in its unscientific approach although calculations of the trusses to be found in the report are, related to today's standards, surprisingly adequate. One may conjecture whether the architects on the committee had better insight into constructional and structural matters than Berlage. Their proposals would, however, have compromised the spatial and, in many places also, the material qualities of the building. One only has to consider the concrete beams, as suggested by the researchers, appearing in a building which conceptually was a traditional structure of wood, brick and stone.

On the other hand it is striking that more than 25 years after the publication of the graphostatical method of Cremona, which had made possible the

calculation and determination of any form in any material, this system had not been applied by Berlage. It appears he obstinately negated the logic of such methods, making forms and structures which were more expressive of the idea of rationality than the result of rational processes. At the same time that Antonio Gaudí y Cornet (1852–1926) was able to build his arches and vaults by understanding and applying the most advanced methods of structural analysis with models, Berlage was so absorbed by the idea of simplified form, of bringing the building to rest, that there was no place for a scientific method of form-finding such as Gaudí employed to resolve the static forces organically. The fact that we find few problems of cracking in Gaudí's work is as much symbolic as revealing in comparing the work of the two masters.

The trusses

It was in the Beurs where Berlage had, for the first time, the chance to find a solution for the covering of large spaces (Figs. 14, 15 and 16). The goods exchange, the largest of the courtyards to be covered, and the stock exchange, received a saddle roof on trusses while the corn exchange was covered with a row of industrial lights on straight, composed iron rafters. These rafters have one continuous height, which means that the general form does not literally express the loads of the roof lights nor on what structural principle the trusses are supported at each end on the open-work metal brackets. The two other halls display a completely different solution, in which the general form and the parts express much more clearly the desired tracery of forces through dimension, position and

direction. It is here perhaps, that Berlage has experimented and developed most. But how advanced was this construction and how logical? And was it the work of Berlage himself or his structural engineer J.J.L. Bourdrez?¹² The calm, which Berlage undoubtedly strove for in the Beurs, is weakened not only by the emphatic presence of trusses having a very specific form but also by the way they plunge between the walls.¹³

The protruding tooth-like cornice where the walls terminate is brought down locally in a strange way, while the brackets on which the trusses rest give the same feeling. The originally conceived desired image was clearly different. The perspective drawing of the main hall shows that the trusses were thought to be maximally transparent, thanks to the application of long tension rods. The trusses dissolve against the plane of the glass roof and the upper parts of the side walls. The brackets, also, are more integrated into the plane of the wall. The elements of the trusses are restful, all parts in tension having the same section like all components in compression. Why then, if Berlage wanted 'rest', did he change the roof structure for one that is much more assertive? The origin of such an important change is not known. It may be related to the new knowledge and insight into steel structures; the absence of tension rods between the ends of the span seems to indicate such an influence. Yet tension rods had to be added rather soon after completion of the building, which fact gave the construction a remarkable ambiguity. And, curiously enough, they still appeared immediately before the trusses were put into production. Tension rods were proposed in the competition project of 1885, as can be seen in the

Figure 14. The goods exchange seen towards the other two courtyards. Perspective pertaining to the specification drawings for bids, 1898.

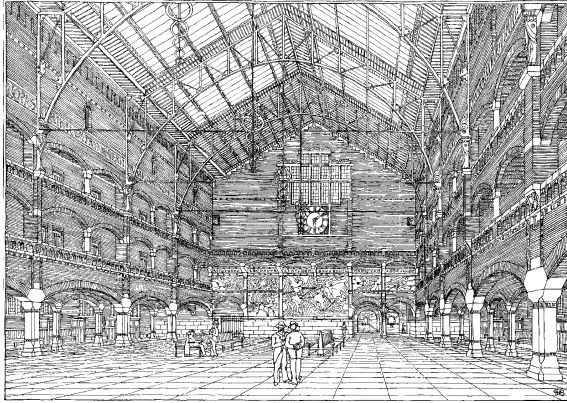


Figure 15. The goods exchange seen towards the other two courtyards. Perspective pertaining to presentational drawings by H.J.M. Walenkamp in 'de Architect', 1901.

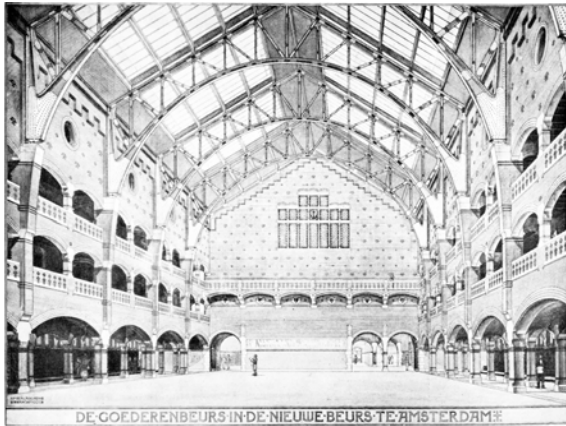




Figure 16. The goods exchange seen in the same direction during erection of the spans. Photograph taken by P. Oosterhuis. (Source: Begemann Archief in Helmond City Archive.)

perspective of the main hall, but this was several years before the commission was awarded to Berlage. They were accepted as a necessary means to support the building, and more specifically the roof surface, and symbolised the rationality of the architect and his production. Reflecting on the problem of the tension rod in the great hall one must admit that Berlage had, seemingly, developed a better eye for a restful image than for resolution

of static forces. This must also have been the conclusion of the Committee which, quite soon after the building had been inaugurated, commented on the failures that had become obvious, such as severe cracking of the walls and displacement of the trusses.

One should call attention to the presence of Pierre Cuijpers in this committee, of significance because of a notable oversight by the biographers

of Berlage and his Exchange building, the obvious identity of the trusses we are discussing here with those which had been designed for the courtyards of Cuijper's Rijksmuseum between 1877 and 1885, many years before Berlage completed his definitive design for the Beurs. In fact, the realised trusses look even more like those for the National Museum (Fig. 17) than the ones which were presented by Berlage for the building. This is even more significant since the form of these trusses is not very usual. I know of only very few look-alikes, one being the enormous spans for the Halle des Machines in the Paris World Exhibition of 1888.

The main question concerning the realised trusses is why did Berlage decide to use trusses without tension rods when he started to build the covering of the courtyards? Before answering that question a few differences with the Cuijpers solution should be noted. First of all we see that Berlage left out non-bearing elements, like the decoration at the feet of the trusses. His 'decorum' exists in the form resulting from the expected load and in the emphasis placed on the functional elements, like the rivets and the gusset plates, by bright colours. Furthermore Berlage used hinges at both ends of the truss, while Cuijpers tied the feet to the bearing wall. Interesting to note also is the double roof of the Beurs, with which Berlage managed to solve the physical problems that would result from a single-sheet roof as in the Cuijpers solution.

A further discovery

Because many original documents have disappeared it remains impossible to answer questions

about changes in the roof construction at the time of erecting the building. The Berlage archive in the Nederlands Architectuurinstituut does not contain the necessary material but some relevant material was located in the City Archive of Helmond, the archive of the once Helmond-based construction firm Begemann which manufactured the iron work for the Beurs. The most interesting items in the archive are the letters sent by J.J.L. Bourdreuz, civil and building engineer in Breda, to the Begemann firm between January 1897 and mid-1900. It becomes obvious from these letters that Bourdreuz was the consulting engineer responsible for the building specification concerned with the iron work and possibly for other parts where the specification is concerned with structural elements. Curiously enough this was not reflected in the work of the Committee which investigated the structural failures of the building in 1906. Bourdreuz writes on January 11, 1899 to Begemann: '... as I wrote in the building specification ...' thus declaring himself author of at least those items in that specification which dealt with the trusses.

This indicates that Bourdreuz was already responsible for the trusses as they appear in the working drawings and as published in April 1898. Berlage had explained these drawings during his Beurs lecture on April 1, 1898 to a group of colleagues and other members of *Architectura et Amicitia* and the so-called *Maatschappij ter bevordering van de Bouwkunst*.¹⁴

One of those present must have been Bourdreuz, who had become a member of A et A on June 1, 1897. This was just over a month after Berlage had joined on 25th April. Three weeks after Berlage

gave his lecture it was Bourdrez who took the floor and spoke about 'Yzeren Daken' (iron roofs). Perhaps it was Berlage who introduced Bourdrez to A et A after inviting him to become the engineer for the Beurs.¹⁵

Berlage published his first sketches for the Beurs in October 1896. By the end of that year he got the green light from the City Council and in March 1898 he had the specification ready for bids. In April Berlage and Bourdrez gave their lectures and on May 9 the bids were received.

When Berlage emphasised in his lecture the perfect collaboration between the architect and the engineer, he most probably had Bourdrez in mind. But neither mentioned his partner in their subsequent lectures nor, more precisely, are their names given in the publications. Yet both must have been happy with the results. Before the Begemann firm started manufacture, in the winter of 1898–9, Berlage and Bourdrez had changed their minds, omitting the proposed tension rods and altering the form of the spans. Thus the changes must have occurred between receiving the bids and the start of the manufacture of the trusses between early May and the end of December 1898. It has not been possible to find direct correspondence between Berlage and Bourdrez nor any other material that might give an answer to the question of when and why the two changed the design. From the Bourdrez letters and from blueprints which were returned by Begemann to the building office it may be inferred that after January 11, when the first letter was sent from the city of Breda by Bourdrez to Begemann in Helmond, only minor changes took place. Even though Begemann was afraid that the

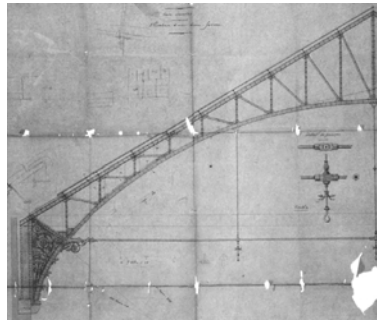


Figure 17. Truss for the courtyards of the National Museum ('Rijksmuseum'), Amsterdam 1877–1885. Architect Pierre Cuijpers.

trusses would need reinforcement during the erection, Bourdrez refused to change them. The form that Berlage and Bourdrez gave to the trusses, together with the new dimensions, must have been a precious thing for them of which they were proud. Only the letter that Bourdrez sent on March 9, 1899 mentions a change in truss A: 'Tomorrow the revised truss A will be sent to Mr Berlage for approval – I may bring it next Sunday for discussion'.

But Bourdrez does not explain what the revision entailed. Neither is it clear who proposed the change. Bourdrez must have been confident of his modern calculations, based on the newest methods, which he had mentioned and explained in his lecture. But according to calculations by the Inspection Committee in 1906 Bourdrez had made mistakes with quite disastrous consequences. One detail in the building specification throws some light on this episode. In the description of the four different trusses, the writer calls those for the

passage between the halls (D) stijve spanten (stiff trusses), which implies that the others (A in the main hall and B and C in the smaller ones) were not stiff. Therefore A and B needed tension rods, which afterwards were left out while, as mentioned above, the detailing of trusses changed fundamentally. Also, truss D in itself shows a construction which seems to predict the final form of the A and B trusses and which form provides stiffness (Figs. 18 and 19).¹⁶

The Inspection Committee of 1906 calculated the spreading of the feet of the trusses under full load as being too big for the rolling space provided on the brackets (Fig. 20). This implies that the Committee was right, Bourdreuz must have miscalculated. On the other hand, the inclination of the walls, which must have occurred once the building had been finished (and which was established by the Committee), were such that even if Bourdreuz's calculations were correct, problems would have arisen. The Committee neglected to analyse the cause of the inclinations which occurred on both sides. I contend it is precisely in those walls that we find the origin of the whole problem. Even if the trusses were stiff enough, and this I believe, with Bourdreuz, to be the case, problems would have arisen. The Committee calculated the outward movement (starting from the proposition that the arches rested on one hinge and one roller instead of two hinges, which in itself was a wrong supposition), but it seems that they overlooked the influence the vertical vector of the load of the trusses on the corbelled wall brackets was going to exercise on the walls, or rather on the bearing plates in the 'wall'. The problem is the insufficient thickness

of those walls. The responsibility of the engineer did not, it seems, include the non-iron parts of the building which were not included in the calculations. The rationale of the newly developed theories did not yet include traditional materials and structures. In examining the Beurs one understands that Berlage lacked insight into those problems which, simultaneously, were being resolved in the structures of Antonio Gaudí in Catalonia. Examination of the section reveals the weakness of the whole.

Materials and their application

Brick, stone and iron are the most striking materials in the Beurs apart from unpainted wood and tile work. Generally speaking Berlage represents the mass of the people in the brick planes, puts the natural stone in such places where forces are bound together and represents in the iron trusses the progression of mankind. But he also demonstrates honesty in leaving material uncovered or untreated to show its natural origin, such as wood, and truth in the application of so-called ignoble materials without hiding them, like industrial iron. Was Berlage, in so doing, being modern and progressive or was he revealing his own conservatism when building the Beurs? In his publications a few years later Berlage mentions that he himself at 'the Congress in Madrid' (international meeting of architects in 1904) had spoken about the failure of iron as the originator of a new style. This was soon after the Beurs had been opened to the users and the public. Although Berlage makes clear that the inflammability of the material was the main origin of the failure (fire regulations later on

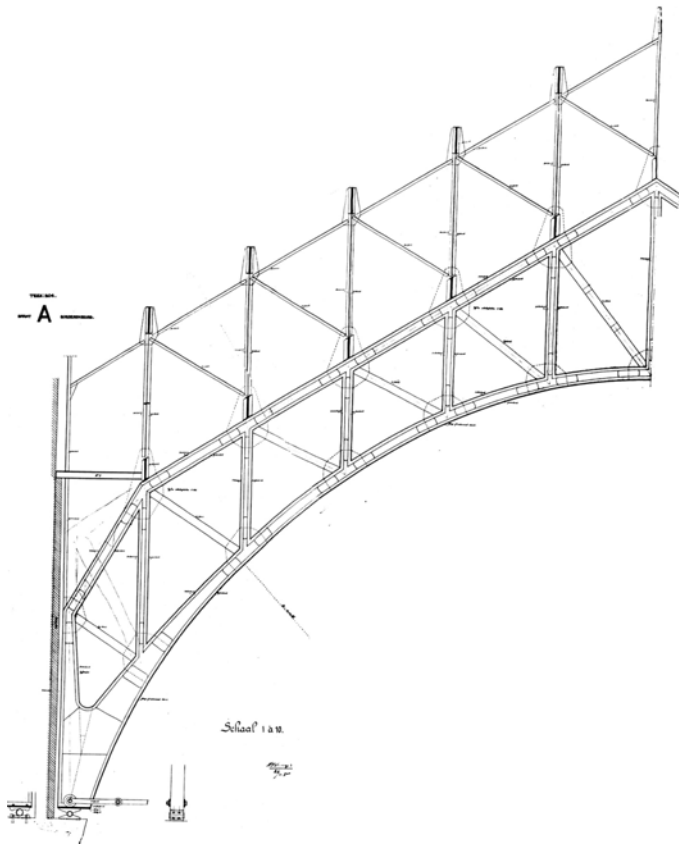
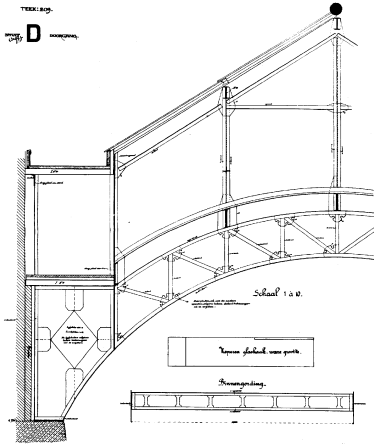


Figure 18. Truss A for goods exchange, with tension rod! Working drawing 204 with sketchy lines that show the definite form. Signed by Berlage on 23.11.98. (Source: Amsterdam, Gemeente Archief).

Figure 19. Working drawing 209 showing half of truss D. Signed by Berlage on 23.11.98. (Source: Amsterdam, Gemeente Archief).



required the material to be covered and thus made invisible) he at the same time declares that it was also an aesthetic failure, 'when they tried to use it in that combination for which it seemed to be the right one, namely in relation with stone.' (Brick in Dutch is called *backsteen* = baked stone.) This seems somewhat to contradict what we find in the Beurs and what we admire so much, the bold combination of iron, brick and stone as the major bearing materials. Yet Berlage continues '... iron and stone are of too different characters to combine harmonically.' Even more striking is that '... iron in general lacks the quality of rest, which only a certain mass is able to procure ...' (Fig. 21).

Although reinforced concrete had already been developed for some time, Berlage did not employ it in his building, even in such places where it would have been invisible, which may be due to his aspiration for honesty. Otherwise it is not easy to understand why he did not use this modern and up-to-date material, where it would have been feasible, such as in the spans for the hall, even more so given Berlage's objections to the use of iron at the Madrid Congress and what he said in the same speech about reinforced concrete in his conclusion: 'As a result of the great advantages of reinforced concrete there exists the probability that we are standing on the threshold of a totally new architectonic era, in which this material will be the actual application, which makes the study of the art form already more demanding.' We can only conclude that Berlage was altogether not very happy with the solutions in his Exchange building. In 1911 E. von Menseffy wrote in his book on reinforced concrete (*Eisenbeton*), when he compares steel (iron) and (reinforced) concrete, that even Berlage with the spatial creations in his Beurs did not manage to overcome the problem that, in general, metallic spans were not yet artistically appreciated.¹⁷

Bond, brick dimensions and proportional system

In a well-detailed building there exists a coherence between the applied dimensions and proportions and the choice of materials. Berlage wrote: 'The art of building is the art of pure composing', and Viollet-le-Duc: '*les rapports entre le tout et les parties ... satisfassent en même temps la raison et les yeux*'. In principal locations Berlage applied three materials which co-determined the dimensions of the building, iron, stone and brick, the latter being the only com-

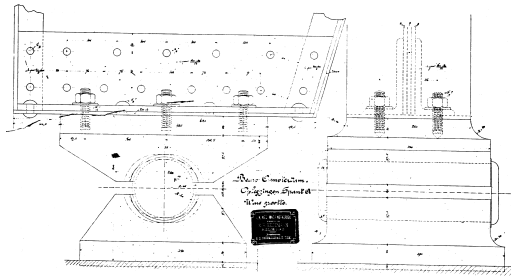


Figure 20. Detail of foot of truss A without tension rod, as drawn for (or by) Begemann firm; date unknown. (Source: Amsterdam, Gemeente Archief.)

ponent with standard production sizes. Although the immense amount of brick in the Beurs would have made possible a specific standard, Berlage applied an existing one the Waalformat, the most robust format that the Dutch brick industry was able to produce. It is not by chance that the Waal brick has a basic proportion of 1:2, the measurements being $5.25 \times 10.5 \times 21.5$ cm, which makes it suitable for one of the triangles which Viollet-le-Duc indicated as proportionally correct – *the equilateral, right-angled*. But it did not, therefore, co-ordinate with the Egyptian triangle which Berlage seemed to prefer. A brick with such proportions would be difficult to set in a bond, this in contrast with, for example, the applied Waal brick. The simplest bond would be the *running* (stretcher) bond, but Berlage used a less visually dull cross bond in which, at terminations and corners, he could use the so-called *drieklezoor* (a three-quarters stretcher) and improve the strength of the wall (Fig. 22). But also the bond that Berlage chose to apply has its restrictions. Parts of walls, as between windows, required odd numbers of headers which resulted in a different (symmetrical) termination pattern from those

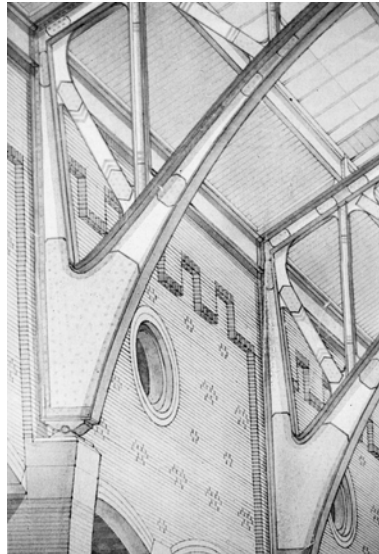
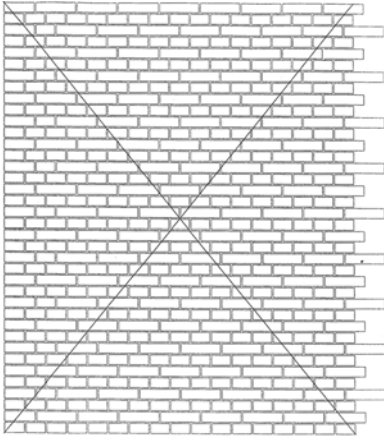


Figure 21. Feet of trusses A over goods exchange. (Publication drawing in *de Architect*, 1901 by H.J.M. Walenkamp.)

Figure 22. Brick work with proportional systems
17 headers – 19 courses
= 8 : 5 (Author's scheme).



of even numbers: a-symmetrical and therefore unquiet. As Berlage aimed at quietness we may suppose that he had a preference for the first solution and therefore made wall sections between windows with odd numbers of headers. The general module of 17 is thus correct, but the wall part referred to is 34 headers with 20 headers for window openings and 14 between windows at the main floor, both even numbers. Contrary to the theory, Berlage includes the necessary three-quarters in the course of headers, sometimes he even uses quarters, again quite against the rules. We can recognise the principle that Berlage followed in the corners of the building; there one can see the course of headers in one façade passing into the course of stretchers of the other.

The aftermath

In 1906 a major investigation was executed by a group of celebrated architects and professors of Delft Polytechnic, concerning serious defects in the building's construction. The Committee seems to have wanted to save the architect in spite of the serious problems that had arisen in the very short period of the Beurs' existence. On the other hand, some of the conclusions of the report are, to say the least, a bit weird. It is necessary to take into account the state of technical knowledge and the theories of the day. Most surprising is the absence of a discussion between the architect and his engineer and the Committee. Of special interest is what the Committee concludes about the deformation of the trusses in the great hall. The Committee calculated a horizontal deformation at the root of the trusses in tenths of millimetres which displays both their theoretical precision and their lack of practical insight. Already the lifting of the complete truss from the floor of the hall to its final position required more freedom of movement between the walls than the few centimetres that the Committee calculated for the horizontal deformation under the pressure of the loads once the whole construction had been completed. There is no written evidence concerning the inaccuracy of Berlage's calculations.

This discussion is still relevant and would provide useful insights; for the purposes of this paper only very general remarks can be offered. The building contains some bold constructional concepts in the first place due to the underground conditions of the site as discussed above. The Committee first comments that the structure would be adequate on compact sand, which is not to be found in

muddy Holland. Secondly, the Committee explains it is illogical to distribute the functions in such a way that the larger open spaces are located in the lower levels and the smaller rooms above, which is the opposite of what is desirable for optimum stability. It is indeed remarkable how unstable the construction appears to be on each side of the great hall at ground floor level. Further detailed consideration of the trusses of the Beurs is required before a definitive assessment can be offered about the architect and his engineer. The trusses as built have a clearly expressed visual contribution as well as fulfilling a structural necessity. The Beurs should be viewed as a laboratory in which a whole range of experiments led to new solutions several of which failed. This does not mean that the leaders of that laboratory were misguided; on the contrary, if we wish to reveal the secret of the Beurs it is necessary to start from the proposition that, highly intelligent as they undoubtedly were, they knew very well all along what they wanted.

Conclusion

A prime question which remains is, what was the influence of the collaborators on Berlage such as J.J.L. Bourdrez and R. Lambeek? Whereas Berlage was without doubt the nominated architect responsible for the project and its realisation, Bourdrez must have been the designer of the realised iron components which became one of the major features of the building. A further highly important aspect is the proportional system. Who introduced the system? Berlage was late in applying the 'Egyptian triangle' and the 'double square'. Several architects, such as De Bazel were ahead of him. The

design sketches and drawings do not show any trace of a systematic application of the two mentioned figures until sometime during the spring of 1897. This was about the moment when, on 15 May 1897, Johannes Balthazar Lambeek came to live on the premises and work there as the main representative (Hoofdopzichter) of the architect. By then Lambeek had already designed and published some personal work in the periodical *Architectura*, of which he was an editor. He may have been responsible for the translation and publication of two of Viollet-le-Duc's *Entretiens*, one of these dealing with proportional systems, amongst which is the 'Egyptian triangle'. The article was signed J.L. . . .¹⁸

Notes and references

1. Pieter Singelenberg, *H. P. Berlage Idea and Style, the quest for modern architecture*, Utrecht, 1972.
For an extensive bibliography see Wessel Reinink, *Amsterdam and Berlage's Exchange*, (Contemporary Criticism, 's-Gravenhage, 1975). Manfred Bock *Anfänge Einer Neuen Architektur*.
For Berlage's own publications see specifically his *Studies over Bouwkunst, Stijl en Samenleving* (Rotterdam 1910 and 1922), especially *Over de waarschijnlijke ontwikkeling der Architectuur*, and also *Grundlagen und Entwicklung der Architektur* (Rotterdam, 1908).
For the competitions for a new Exchange building in the 1880s see *H. P. Berlage 1856–1934 een bouwmeester en zijn tijd Bussum*, 1975, p. 277 etc, in *Netherlands Yearbook for History of Art*.
All of Berlage's own texts have been translated into English and published by the Getty Foundation.
2. The Central Station, by Pierre Cuijpers was built in 1885 on new-raised land in the Y river precisely where

the Amstel river flowed into it (and has been much criticised for that reason to this day, as it blocks the view from the city to the harbour). Remarkably enough the station complex has not suffered from the problems of having been built on a comparable site to the Beurs.

3. We must take into consideration that in the nineteenth century the city limits generally did not include much open space, which meant that annexation of neighbouring agricultural communities had to take place to make enlargement of the city possible.
4. Ever since discussions about the replacement of the Zocher Exchange, built in 1840–45 by Jan D. Zocher jr., had taken place, many different sites had been proposed at least from the first round of the competition onwards. Since they are not relevant here, I only want to mention Wessel Reinink's *Amsterdam and Berlage's Exchange*, (Contemporary Criticism, s-Gravenhage, 1975): also for the history of the Commission.
5. Lecture held at the request of his colleagues, Jeroen Schilt and Jouke van der Werf, *Genootschap Architectura et Amicitia*, (Rotterdam, 1992). Also *Architectura, organ v. h. Genootschap Architectura et Amicitia* (magazine) Amsterdam, 1898 and *Bouwkundig Weekblad, organ van de Maatschappij tot bevordering der bouwkunst* (magazine) (Amsterdam, 1898). These periodicals and *De Opmerker* are the main contemporary publications on the Beurs.
6. The Dam square itself was named after the old dam in the river Amstel, the origin of Amsterdam or Aemstelredam, founded in the thirteenth century.
7. The distance 33.00 m., foreseen in the site drawing for the competition, between the building and the 'nieuwe te maken bekleedingsmuur' (the new covering wall for the water side) does not exist in reality, as can easily be seen when visiting the site.
8. Sergio Polano *Hendrik Petrus Berlage, het complete werk* from the Italian *Opera Completa* (Milano, 1987), *Thoughts on Style, 1886–1909*, Getty Research Institute for the History of Art and Humanities, 1996.
9. *Tekeningen Disegni Hendrik Petrus Berlage* (Catalogue, Biennale di Venezia, 1986).
10. This is not the only example of an architect as experimenter of course. There is more experiment – so decisive for the built form – than is usually acknowledged. The famous Zonnestraal complex by Duiker (Bijvoet) and Wiebenga turned out to be, in an analysis conducted by Hubert Jan Henket and Wessel de Jonge in the 1980s, one long series of experimental constructions, in which the architect-engineers were continuously inventing static and physical solutions for the problems to which they had to respond.
11. *Rapport betreffende het onderzoek naar den toestand der Koopmans Beurs te Amsterdam* (Amsterdam, 1906). Two parts and appendices, such as calculations and recommendations.
12. The Begemann firm archive contains the letters that J.J.L. Bourdrez sent to Begemann from Breda, where from September 1898 to Summer 1900 he ran a private office and held a position as teacher at the KMA, the Royal Military Academy. The letters are numbered from which it becomes clear that several of them are missing. Therefore – and because there are no letters by the Begemann firm to Bourdrez or Berlage – it becomes impossible to know what precisely happened and who was responsible for what. In 1900 he started to work as the principal engineer for the railway from Rotterdam to S2215cheveningen (The Hague), being responsible for all major structures for this line (Obituary in *De Ingenieur*, 1924). It is unclear whether Bourdrez worked for Berlage in his municipal office or as an independent engineer.
13. In itself it was a difficult and very precise manoeuvre to place the trusses between the already finished

walls, as may be seen from photographs taken during the construction works.

14. The set of drawings were presented at the annual 'Tentoonstelling van Bouwkunst' from April 27–May 26 in the club building of the Maatschappij at Marnixstraat 402 (nowadays the Nieuwe De La Martheater right behind Kromhout's Hotel American). The drawings had to be sent in before April 13. The exhibition was dedicated to the coronation of Queen Wilhelmina.
15. See *Architectura et Amicitia* (Note 5).
16. C is a different kind of span, a horizontal truss.
17. The analysis by Viollet-le-Duc (and probably Semper?) is only partly right. The 'gothic' did not exist as one style, one system, one structure. The common denominator, the essence of 'the' gothic, is the search for and finding of a different way of building, one that demands rather less material for larger envelopes of spaces. As such the gothic still exists in our days. It furthermore must have been of influence that the greater demand for permanent structures made it necessary to import materials along longer transport lines to develop new materials. At the same time there is the wish for exclusiveness in a society of abundance. These are factors that played a role in the project for the Beurs.
18. The architectural historian Marty Bax supplied me with a copy of her article in *Jong Holland* (1990,4, notes 10–12), in which she claims that J. B. Lambeek, JBzn, was the translator of the *Entretiens* and not, for instance, J. M. Lauweriks, also an editor of the same journal at the same time as Lambeek. But there is no proof; it could well be the founder of A et A., J. Lelieman, retired architect at that time and thus probably with a larger knowledge than young Lambeek. Also, some confusion is possible concerning the family name Lambeek. The Lambeek who came to work for Berlage was certainly not the one that Bax chose from the Amsterdam archives. That one, with the same names Johannes Balthazar was born in 1877 and notwithstanding the identical names no relative. He would have been young for a supervisor in 1897. And to add to the confusion, more than one Lambeek was a member of A. et A..

Invention from war: a circumstantial modernism for Australian architecture

Philip Goad and Julie Willis

Between 1942 and 1945, Australian architects and engineers within the Allied Works Council and the US Army Corps of Engineers undertook a vast programme of building works to assist the campaign to drive Japanese forces northward through the Southwest Pacific and avoid invasion.¹ Huge distances, lack of time and the need to wage a campaign from the air lay behind US General Douglas MacArthur's phrase that it would be an 'engineer's war'. By necessity, buildings such as airfields, hospitals, camps, warehouses, and other structures had to be light weight, constructed quickly, and inevitably dropped in by air as easily handled pre-cut packages. With the lack of American and European softwoods in the Australasian region, an unlikely local material was pressed into war service – unseasoned or 'green' Australian hardwood. It was a material choice that would have profound implications for two reasons. First, in the years of conflict, circumstances dictated the unprecedented innovation and experiment in light-weight timber structures. Second, in an echo of Lewis Mumford's poignant maxim that 'war is the health of the machine'², the systematisation and ruthless economy inherent in wartime timber buildings would influence the development and practice of a particular form of modern architecture in Australia in the late 1940s and the 1950s.

Introduction

War is often thought of as a time of architectural hiatus. The structures built to defend against or support war are thus rarely seen as architectural: fortifications and temporary structures of war are invariably built without aesthetic intent. While there is continuing interest in what architecture can achieve (and what opportunities there are) through reconstruction after war, there is limited interest in the structures produced for war.³ In the twentieth century, architectural history has diminished, to almost wilful negation, the influence of the two world wars in the shaping of architectural production and the architectural profession, let alone the structures built as a

result of war. This paper will consider the influence of architectural production in Australia during World War II, exploring its innovation and legacy.

During World War II, Australia and its troops would hold a pivotal place in the war against Japan. Unlike other WWII arenas of conflict, such as Europe and the Middle East, Australia, although bombed and directly threatened in parts, did not face widespread destruction of infrastructure or metropolises. The legacy of war in Australia was in some way the reverse. It was the building of crucial infrastructure to service bitter battles being fought on a myriad of islands to the north that had the greatest physical impact on Australian soil.⁴

The Southwest Pacific Theatre (SWPA)

In the first four months of 1942, Japanese air, land and naval forces had swept everything before them in Southeast Asia. They had overrun not only the Philippines, but also Malaya, Burma, and the Dutch East Indies, and they had seized strategic areas in various island groups northeast of Australia. As early as January 1942 they had captured Rabaul and had begun construction of a major base there. Shortly afterwards, they occupied the northern Solomons, and in March they seized Lae and Salamaua, in the Australian-mandated territory of North East New Guinea. It was clear that the Japanese, in order to isolate Australia and cut her supply lines to the United States, would try to extend their conquests still farther south.

With MacArthur's forces scuttled south from defeat in the Philippines, a new theatre of operations, the Southwest Pacific Area (SWPA) was established on 18 April 1942, with MacArthur as commander-in-chief. The plan was to drive the Japanese back through Papua-New Guinea and northward to Japan. To do so, it was clear that it would be a war won from the air. The distances were much greater than ever before experienced. The terrain, materials and climate did not conform to previously known areas of US combat, and nor could lessons learnt in European and Middle Eastern Theatres be easily applied to this new theatre of war.⁵

The threat of invasion was still so serious in mid-1942 that plans for a scorched-earth policy were prepared and instructions issued by the Australian government to put them into effect if the enemy made a successful invasion of the continent. It was

planned to defend primarily the southeastern part of Australia: the area south of a proposed defence line known as the 'Brisbane Line'. As a consequence, mainland Australia's southernmost city, Melbourne, became the SWPA headquarters.

Located on the northern coast of Australia, Darwin became the site for an advanced air base and a port of embarkation for troops and supplies going to more forward bases. Brisbane became the site for the main US base for the assembly, repair, and maintenance of all types of aircraft, and the principal supply base and port of debarkation north of Melbourne. Townsville was to be a secondary base for light aircraft. The headquarters of the US Army Forces in Australia (USAFIA) was in Melbourne, which was also the principal port for the debarkation of troops and supplies. Melbourne also became the major location for the Engineers' Section, which was responsible for the design of the infrastructure and the mostly timber structures that would accompany the surge northward to eventual victory.

Sverdrup & Parcel

The continuing European conflict and attack at Pearl Harbor meant that there were practically no US Army Corps of Engineer officers or enlisted men available for assignment to the Engineers' Section in Australia. Fortunately, an American engineering firm, Sverdrup & Parcel, had been at work in Australia since October 1941 engaged in designing and building airfields for an air ferry route from the Hawaiian Islands to the Philippines by way of Fiji, New Caledonia and Australia. In January 1942, Sverdrup & Parcel was given a fixed-fee contract to

perform architectural and engineering services for the USAFIA, and the firm's employees were thus made available to the Engineers' Section. Under this arrangement, this firm was responsible for the preparations of designs, drawings and specifications, and for the major supervision of combined American and Australian army construction projects in Australia.

Engineers Headquarters, Melbourne

The Engineers Headquarters of the US Army Forces in Australia for the Southwest Pacific Area became a separate entity on 4 February 1942. Four US officers and a stenographer moved from the Repatriation Building in St Kilda Road to the top floor of Craig's Building in Elizabeth Street in central Melbourne. It was an old unused warehouse, the only merit of which was a large area of somewhat poorly lit floor space unobstructed except for a few haphazard partitions.

The Architectural Section of Engineers Headquarters commenced a week later on 11 February 1942 when Osborn McCutcheon, a director of the Melbourne architecture firm Bates Smart & McCutcheon (BSM), accepted the position of Chief Architect with the firm of Sverdrup & Parcel, then still under contract as Architect-Engineer to the USAFIA. The next day, Otto Yuncken, a director of the Melbourne architecture firm Yuncken Freeman & Freeman, was appointed Assistant Chief Architect, and within a few days, a drawing office had been established and was in active production. About a week later, A.E. Kelso joined the firm as Chief Engineer, with M.G. Dempster as Designing Engineer and, later S.L. Luker as Assistant Chief Engineer.

Competent field and office technical staffs were quickly engaged, together with the necessary secretarial and clerical staff.

It was not until 15 May 1942 that the cohort of civilian staff engaged by Sverdrup & Parcel was taken over by Engineer Headquarters. Two days later, with the procurement of more modern office equipment, the office transferred to the top three floors of Temple Court in Collins Street, Melbourne's architectural heartland. At Temple Court, the office was to occupy 29,000 square feet, nearly three times that of their previous space.

The architectural staffing was assembled from local practising architects and architectural draftsmen in Melbourne, all of who welcomed the opportunity to play some active part in the war effort. Architects known to have worked for the US Army included Alan Ralton (already at BSM); Douglas Gardiner and Philip Pearce (both of whom were to become postwar directors of BSM and lead the development of highrise building design in Australia) as well as Race Godfrey and Geoffrey Mewton. Under the office manager, Eric Hughes (later of Godfrey Spowers Hughes Mewton & Lobb), the senior staff were organised into groups. Each group, while being available for general work, was called upon to acquire a special and expert knowledge of some phase of the work such as camps, hospitals, warehouses, standards, airport buildings, barracks, etc. This system proved very successful despite all odds, especially as from the Chief Architect down, all commenced with no knowledge of army requirements, standards or procedures. Because of this, an extraordinary amount of intensive study, research, and often experiment, was necessary. For example,

Melbourne architect Henry Pynor, who was in the Procurement Division of the US Army Corps of Engineers, developed a successful design for a portable and telescopic parachute drying flue (5 feet in diameter and 38 feet high). Another Melbourne architect J.F.W. Ballantyne was responsible for the design and development of three types of laundry unit suitable for use under a range of field conditions (Portable, Mobile and Base). His mobile unit was mounted on a 7-ton trailer and 105 of these units were subsequently contracted for construction.

From archival and military records, it is clear that the contact between the Corps of Engineers and the Australian architects fostered innovation, in terms of construction methods, structural experimentation and architectural practice, which had long-term effects on Australian design and its profession. It is also clear however that the American accounts of the role of the Corps of Engineers in the defence of Australia and the subsequent push north through Papua–New Guinea concentrated strongly on identifiably American successes. They substantially played down the Australian involvement and contribution to the development of engineering and architectural structures for the campaign.

The Allied Works Council

Parallel and in concert with the efforts of the US Army Corps of Engineers were the activities of the Allied Works Council whose major role was the integration of the Australian and American war effort in construction in Australia. The Allied Works Council was formed in February 1942 as a response

to the need for an organisation to control and co-ordinate the depleted Australian sources of manpower, heavy construction equipment, and supplies in the face of imminent Japanese invasion. The Allied Works Council had the responsibility of co-ordinating and supervising all civilian effort devoted to the construction of military defence projects. Its membership was made up of Australian civilian officials, the Chief Engineers of the US Army Forces in Australia (USAFIA) and the Royal Australian Air Force (RAAF), and the Engineer-in-Chief of the Australian Military Forces. The Allied Works Council when merged in November 1942 with the Works and Services Branch of the Australian Department of the Interior became the single organisation responsible for all work executed by civilian agencies in support of the military construction programme in Australia. With a staff of 4600, it became the largest collaborative practice in Australian architectural history.⁶

The problem of drawings

From the outset there was a major and practical stumbling block to the Australian-American collaboration. At the beginning of operations there were only about twelve of the several hundred US Standard Theatre of Operations drawings available. Information had to be gathered from all possible sources, such as conversations with officers visiting Engineer Headquarters, discussions with senior NCOs, visits to Australian camps occupied by US troops, studies of Australian practice and so on. Eventually a more complete set of standard drawings became available but not before much useful work had already

been carried out and an ethos of invention and resourcefulness engendered.

There were also problems with the American drawings. They were unsuitable for use in their original form as it was necessary to adapt them to conform to the use of Australian hardwoods in place of American softwoods. This involved a complete revision of structural design. The drawings also had to be adapted to conform to Australian sizes of sheet materials like corrugated iron and the use of alternative materials other than those envisaged in the American drawings. For example, fibrous plaster for use as an external wall and roof covering was one material closely examined by the Architectural Section and such a study in turn involved a complete revision of the structural framework and its design.

In this way the Australian Theatre of Operations or A-TO series of standard drawings came into being. Standard specifications and bills of quantities also accompanied them. As a result, actual projects, when required, could be prepared with the utmost speed. All that was needed was a site layout plan and a schedule of buildings. It was common that two days would suffice for the preparation of necessary drawings and estimates for a 1000-bed hospital. These standard drawings and other documents were made available to Base Sections and thus also formed the basis of American construction projects in the region.

Wartime structures

The works programme of the US Army Corps of Engineers and the Allied Works Council was vast. It involved complex logistical liaison; the speeding up

of administrative procedures in procurement and construction; and the inventive substitution of conventional building materials for light-weight and structurally small and easily transportable members (Figs 1–3). Trussed structures in arched and gabled forms (some of the largest ever to be built in Australia), modular post and beam structures, and composite canvas/timber tent structures resulted from this repetitive systems approach to wartime construction. In Australia alone, construction completed amounted to 300 airfields, forty seven of which were for the US Army, camps for staging ten divisions plus camps for base troops, 8000 km of roads, 11000 hospital beds, and more than a million square metres of covered storage. The bulk of this work was constructed by civilian labour organised through the Allied Works Council.⁷

Most of the structures erected by the Allied Works Council involved the use of green Australian hardwoods. However it should also be noted that a suite of Australian, American and British-designed prefabricated steel, timber and canvas structures also accompanied these timber structures built in the SWPA. It was the exposure to not just an innovative use of timber but also the unique forms of these other structures that would have subsequent influence on postwar Australian architecture. The combination of light-weight timber and the idea of material substitution would have extraordinary influence but so also would the necessary leanness and expediency of the construction process, and also the means of construction and its necessarily limited detail.

Examples of existing prefabricated structures included the Australian-designed Sidney Williams

Figure 1. Section of timber stack at Alexandria. Prefabrication Scheme: bundling of prefab. frames for 20 & 47 ft huts and hospitals. Sydney, October 1943. (Item 50.1/2, box 15, series B5281, National Archives of Australia.)



huts. These prefabricated metal huts were constructed extensively throughout the Australian theatre of operations, and especially so in the Northern Territory and Queensland. The highly efficient Bailey Bridge, designed by British inventor Donald Colman Bailey, was frequently used in achieving difficult river and gorge crossings in New Guinea and involved the basic idea of using trusses built up of panels instead of box-girder sections.

The Butler Hangar and the Luria Catenary Type Hangar were both external light-weight steel-truss structures with suspended canvas beneath to enclose the aircraft. There were also improvised mobile structures such as hospital trains and in another form, a 100-bed hospital with patients and personnel housed under canvas, the whole being readily moveable in motor trucks, including special trucks for the operating theatre, sterilising units,



Figure 2. Stacked cases of asbestos cement. Prefabrication Scheme: bundling of sheeting for hospitals, huts and warehouses. Sydney, October 1943. (Item 50.5/1, box 15, series B5281, National Archives of Australia.)

Figure 3. Box containing all necessary bolts, nuts, washers, nails, and screws for erection of warehouse unit. Prefabrication Scheme: manufacture of 88 ft pre-cut warehouses. Sydney, October 1943. (Item 50.4/1, box 15, series B5281, National Archives of Australia.)

etc. Another material that was used, not just in the SWPA but across the globe, was pierced steel plank (PSP) which could provide an instant runway surface for fighter aircraft. The entire architectural language and structural techniques were drawn into a repetitive and hence productive process during wartime. As a result, virtually every structure found new form.

Essential war material

Despite the use of steel-based prefabricated structures, the majority of buildings constructed in the Southwest Pacific Theatre were of timber, simply because of the critical shortage of the standard building materials. Steel was essential for armaments and munitions and thus unseasoned or

'green' Australian hardwood, a building material that many design and construction professionals would have considered unsuitable, became an essential war material.

It was a choice determined by circumstance – all other materials were in short supply. Most major timber structures employed imported pines and firs. Local hardwoods were limited to simpler structures because, though the timber can be stronger than European or American hardwoods, it tends to shrink and distort more during seasoning. Seasoned Australian hardwood could not be readily supplied in long lengths because of the curing time (several years) needed for the timber to avoid distortion and splitting. Unseasoned hardwood could thus only be

Figure 4. Adelaide River (AWAS Camp), c.1943. (Item 52.2/1.1, box 16, series B5281, National Archives of Australia.)



used in short lengths. The advantages of this timber were low production times and low costs, and the presence of Australian forests, which promised an abundance of the raw material. It was a much stronger timber than imported softwood, allowing the use of nail joints which enabled rapid construction using unskilled labour. The properties of this timber would therefore enable ruthless minimisation and a set of extremely efficient and economic structures that could be erected in a matter of hours or days.

Designs for these timber structures emerged from both the US Army Corps of Engineers and the Allied Works Council, including huts, post and beam stores, trussed roof buildings, workshops, arched buildings and hangar buildings.⁸

Timber structures in wartime

The range and size of timber structures built in Australia during WWII varied greatly. For small-scale work, simple gable-roofed huts of widths between

4.9m (16') to 6.1m (20') were built by the thousand. Serving to house personnel camps, hospitals, prisoner of war camps and ordinance and chemical warfare depots, the huts were minimal designs singly clad in asbestos sheeting or corrugated iron (Fig. 4). Larger buildings, usually intended for general ordinance storage, employed either post and beam or trussed roof systems. With a view to maximising column-free space, post and beam stores generally had columns spaced at 5m (16'8") and 6.1m (20') and ranged in width from 10 to 48 metres, while trussed roof buildings could achieve even greater spans (Fig. 5). Many of these stores had swiftly laid concrete slabs with the timber columns fixed to the floor with steel angle brackets. External cladding was generally corrugated iron or fibre cement sheet with no windows or a very small number of glazed rooflights. It was in the trussed roof designs that the seeds of considerable innovation became apparent. Truss designs varied according to Australian and American influence.



Figure 5. Erection of prefabricated framework. Three hundred feet of roof trusses were erected in six days by 12 men. Meeandah – Warehouse construction. July 1943. (Item 53.3/3.4, box 18, series B5281, National Archives of Australia.)

Where American influence was not great, trusses generally had bolt and shear connector joints, using heavier but fewer timbers and were an improvised version of the traditional mortice and tenon truss type of pre-war Australian construction practice. By contrast, the US Army Corps of Engineers developed truss designs that employed larger numbers of lighter timber members that could be nailed

together by hand and hence employ relatively unskilled labour, as well as greater quantities of unseasoned Australian hardwood.

Where spans longer than 20 metres were required, the most common building form for stores was an arched structure. The most architecturally interesting structures were the arched warehouses and hangar buildings. This is where Sverdrup &

Figure 6. Carpenters pre-fabricating bow-truss cord [sic] on specially constructed table. Rydalmere. Construction US Stores. February 1943. (Item 53.1/2.4, box 17, series B5281, National Archives of Australia.)



Figure 7. View of walls, abutment pads and arches. 2nd store in similar stage of construction. Rydalmere. Construction US Stores. February 1943. (Item 53.1/2.7, box 17, series B5281, National Archives of Australia.)



Parcel's expertise was used, especially in the design of the igloo arch – developed by an Australian engineer, a French engineer, and the Chief Engineer, GHQ, SWPA.⁹ It was made up of small pieces of scrap-size timbers, principally 1 to 3 inches wide, and, with subsequent addition of a corrugated iron roof, provided a form of covered storage which 30 skilled men could erect in about 9 to 12 days (Figs 6–12). Designed initially as a frame for camouflage cover, this igloo-type construction was also subsequently used for warehouses and hangars. It illustrated the adjustment of designs to conform to local

limitations of materials and manpower. Typically these were three pin arches constructed from light hand nailed boxed and trussed arches of green hardwood, though it is known that one such structure was built of imported US Oregon hardwood. Both American and Allied Works Council designers developed the igloo arched store building with standardised spans of 31.7 metres (104'), 32 metres (105'), and 51.8 metres (170'). Until only very recently, with the construction of Ken Woolley's Exhibition Dome at Homebush built in 1998 for the 2000 Olympic Games in Sydney, these

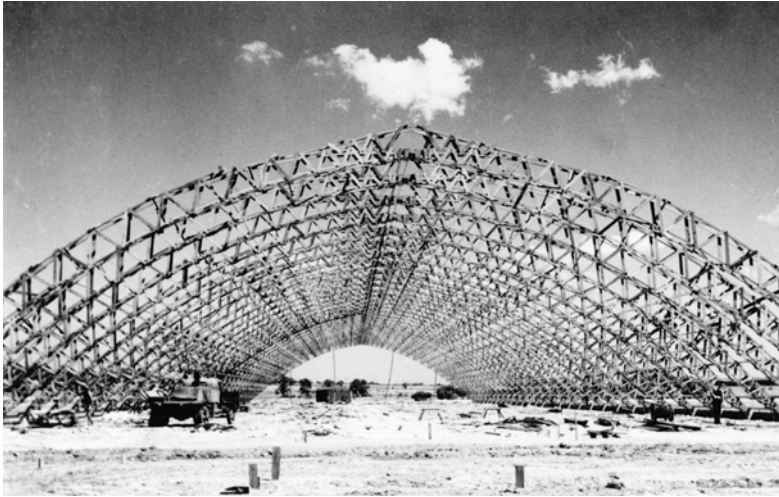


Figure 8. Front elevation of store under construction. Rydalmere. Construction US Stores. February 1943. (Item 53.1/2.12, box 17, series 65281, National Archives of Australia.)

arched buildings were the longest clear span timber structures existing in Australia.¹⁰

Aircraft and workshop hangars were either open-ended igloo structures or trussed hangars whose shape formed the outline of a parabola, and earned the name of 'hog-back' trusses. The trusses for this latter group of hangars were built with bolt and shear connector joints connecting pieces of green hardwood and a number were constructed in Victoria, New South Wales and Queensland.¹¹

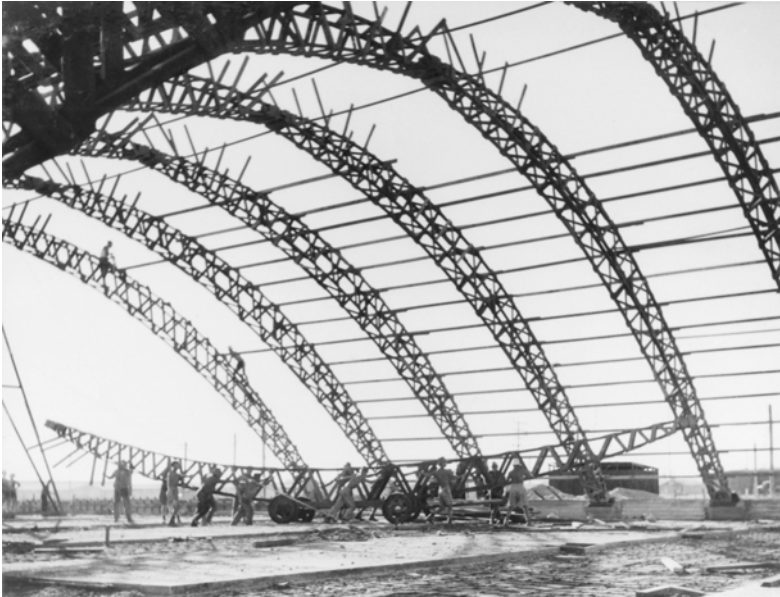
The ethos behind the design of all of these structures was one of improvised minimalism and a ruthless engineered economy behind the use of a

readily available material. There was no specific aesthetic intention rather a pragmatism and sense of success gained from the necessity of the method. These buildings were not the result of the necessity of artifice but born from the necessity of production.

Postwar application

The implications of this architecture from war were an ethos of structural rationalism and systemised material and production delivery that engendered an unique postwar architecture culture especially in Melbourne, Australia – the wartime headquarters

Figure 9. Members of the [Civil Construction Corps] mobile unit wheeling prefabricated bow trusses into position for erection. Townsville – Garbutt – RAAF Store. July 1943. (Item 53.3/1.4, box 18, series B5281, National Archives of Australia.)



of the Southwest Pacific Theatre of Operations. Three areas of practice were immediate inheritors of this timber-driven aesthetic: the pre-cut timber house; the development of the so-called Melbourne School, a group of buildings that exhibited daring structural expression; and the revision of postwar corporate practice and the emergence of the high-rise curtain wall skyscraper.

The pre-cut timber house

Immediately after the cessation of hostilities, the prefabricated house was seen by architects and government bodies across the world as a potential solution to the pressing demand for housing. There was also the issue of what to do with wartime industries. Propositions therefore for steel houses such as the Beaufort (1946) and Myer Houses



Figure 10. Showing igloo framework under construction. Townsville – Garbutt – RAAF Store. July 1943.

(Item 53.3/1.2, box 18, series B5281, National Archives of Australia.)

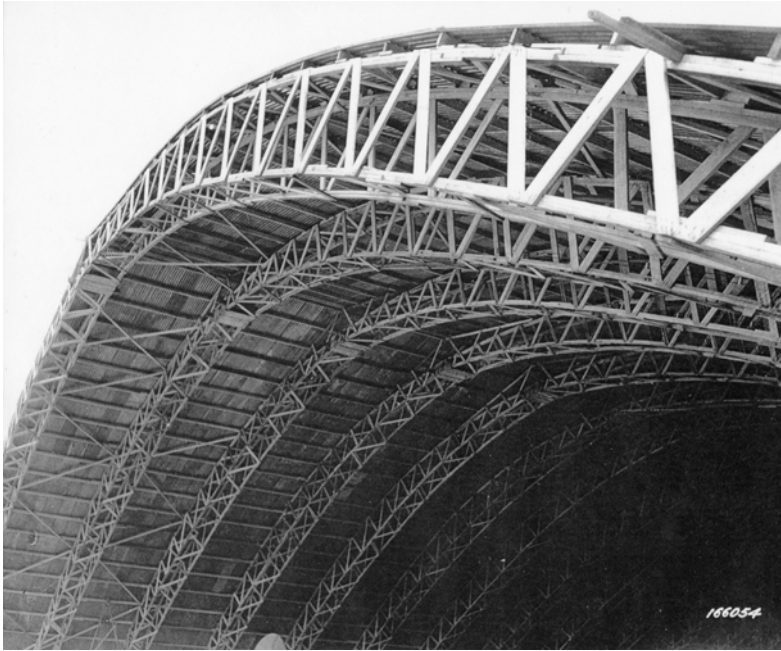
(1945) that were produced by aircraft factories enjoyed brief currency. Instead, it was the pre-cut timber house that was to have greater impact and application. Ironically, however, Australian hardwoods were often not used in these prefabricated schemes. In a reverse of the wartime situation, many of these timber houses were imported from England, Scandinavia and France.¹² On other occasions the wartime expertise that had been gained through the use of repetitive timber construction was applied to the design but not to its material choice.

For example, Otto Yuncken's firm was involved in 'Operation Snail', the project initiated in 1948 to attract one thousand urgently needed British migrants for employment by the Victorian Railways. In order to house such a large number, and to compensate for the inability of local resources to supply the housing upon which the

whole idea depended, it was decided to seek houses from abroad. By late 1950 with the principal contract awarded to a Nottingham (UK) firm, over 2000 permanent timber houses were being supplied at a rate of forty per week to not only Victorian Railways projects throughout the state but also to the State Electricity Commission's new townships of Newborough (Yallourn) and Mt Beauty (Kiewa), as well as the new town which the State Rivers and Water Supply Commission was building at Eildon.

The houses themselves were a blend of imported and locally produced components with the maximum proportion of labour content of the houses being applied at the English end. Australian components included the stumps, bearers and joists, gas or electric stove and canopy, and the installation of electricity and plumbing. The superstructure was pre-cut, packaged and marked in

Figure 11. Construction of bows of repair hangar 46 at an Engineer installation at 4th Air Depot, Townsville, Australia, December 1942. Photograph: Pvt Joseph Herda. Signal Corps Photo #GHQ-SWPA-SC-43-2418-19S-147E/SC166054. (Held in National Archives and Records Administration, College Park, Maryland, USA.)



England and delivered in complete house lots. Most of the timbers were Swedish whitewood, dressed throughout and formed to the exact size and shape. All the timbers were kiln dried, and the external vertical lining boards were primed in England to minimise distortion during transit through the tropics. The low pitched gable roof was made up of

light timber trusses. The result was a range of forty-four different house types of two, three and four bedroom homes.

In a curious turnabout, wartime systems were applied to postwar peacetime building but not in fact using the local material that arguably had helped win the war. Melbourne architect and critic

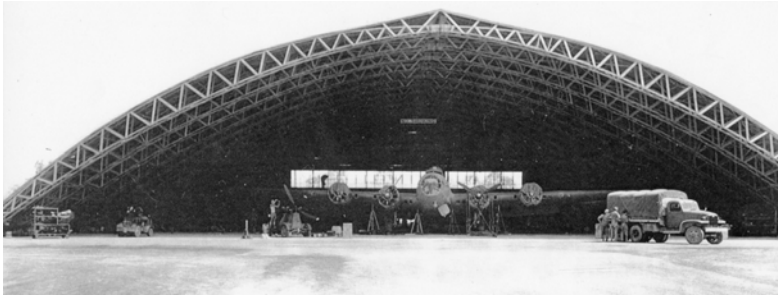


Figure 12. A B-17 is parked inside a repair hangar at an Engineer installation at 4th Air Depot, Townsville, Australia, December 1942. Photograph: Pvt Joseph Herda. Signal Corps Photo #GHQ-SWPA-SC-43-169-19S-147E/sc 166048. (Held in National Archives and Records Administration, College Park, Maryland, USA.)

Robin Boyd (1919–71) was to ask ‘Is Australia incapable of solving for herself this problem?’¹³ Across Australia, the pre-cut timber house in a range of designs was applied to new township designs for major postwar infrastructure projects involving hydro-electricity, transport and water supply. By the mid-1950s, it was a philosophy that informed the building of houses for remote mining towns and was exemplified by Ernest Milston and Don Hendry Fulton’s Mary Kathleen uranium mining town houses in north Queensland (1956) where pre-cut timber and the module dictated modest but eminently workable house forms.¹⁴ Thus it was that the philosophy of the modularisation and prefabrication of the building system became the rationale, while the Australian timbers were eschewed in favour of imported timbers.

The Melbourne School

The same fascination for the module of timber construction also swept through Australian archi-

ture schools in the late 1940s and early 1950s. Spatial thinking moved from Le Corbusier’s plan libre to a disciplined modulated approach to spatial division and expedient light-weight structural sections, an inheritance largely of wartime experience.

Modernism, as now reinterpreted, largely meant a frame with repetitive components. Flexibility became interchangeability as the ‘modular plan’ replaced the free plan and ‘form follow(ed) form’.¹⁵

University projects focussed on modular construction in residential design. Typical products were Douglas Alexandratos and Peter McIntyre’s 1949 schemes for ‘A House for the Immediate Tomorrow’. Both were of modular timber construction with lightweight panel materials and structural window mullions.¹⁶ In practice, these concerns were translated into rigorous modular timber house designs for one-off clients but there also came a specific structural functional response to

Figure 13. Robin Boyd, Richardson House, Toorak, VIC, 1954. Photograph © Wolfgang Sievers. Reproduced with permission.



the design of postwar domestic and institutional buildings that came to be known as the Melbourne School and which encouraged designs of daring structural expression. In no other Australian city was the sense of lean structural experiment so widely felt.

Chief among the Melbourne designers exploring timber construction was Robin Boyd whose Finlay House, Warrandyte (1951) and Clemson House,

Kew (1957–59) employed the repeated scissor trusses to provide dynamic butterfly roofs and shed rainwater to a single point. His Gillison House, Balwyn (1952) was an attempt to reduce the timber frame to its most basic structural essence, the diagonal of the timber stud frame, while his Richardson House, Toorak (1954) (Fig. 13) was a translation into steel of the arched forms of the workshops and hangars of wartime but with a



Figure 14. Kevin Borland, Peter McIntyre and John and Phyllis Murphy, Olympic Swimming Stadium, Melbourne (1953–6).

Photograph © Wolfgang Sievers. Reproduced with permission.

disciplined timber box suspended between. Peter and Dione McIntyre explored light-weight timber construction with a series of eight arched roof houses. The concept of the houses was based on the idea of a flexible plan roofed by 8.2m (27') wide gently arched timber trusses supported on timber posts with the internal walls designed as panels of a standard size and which could be taken away without affecting the structure. The owners were then not only able to change the size of the rooms but also the arrangement of bedroom and living areas.

Larger structures like Kevin Borland, Peter McIntyre and John and Phyllis Murphy's Olympic Swimming Stadium, Melbourne (1953–56) (Figs 14 and 15), while deriving much of its formal principle from an earlier Harry Seidler competition entry (1952) for another stadium,¹⁷ could also be read as a virtual hangar for swimming in with its marching

line of canted girder trusses. Even the steel-arched Basketball Stadium (1956) built in the grounds of Melbourne's Exhibition Buildings seemed to recall the arched hangars and workshops of nearby Werribee and far off Queensland. Another wartime analogy could be made with Yuncken, Freeman Bros. Griffiths and Simpson's Sidney Myer Music Bowl, Melbourne (1956–59) (Fig. 16) which might be read at one level as a giant piece of camouflage netting drawn across a sunken gun emplacement rather than its final function, an innocent acoustic bowl for free concerts in a park.

The influence of wartime structures was not only apparent in Melbourne. In Queensland, architect E H Orbin was directly influenced by the igloo structures he observed in Mareeba and Atherton, both in form and material. In 1959, he designed St Paul's Anglican Church in Proserpine, which employed a three pin laminated timber arch, a form he would

Figure 15. Kevin Borland, Peter McIntyre and John and Phyllis Murphy, Olympic Swimming Stadium, Melbourne (1953–6). Photograph © Wolfgang Sievers. Reproduced with permission.



use again for the Mareeba Public Hall, designed in 1961. Like the igloo structures of WWII, Oribin's arches were made up on site.¹⁸

While it is clear that unseasoned Australian hardwood plays little direct part in any of these postwar structures, there is little doubt that the wartime construction experience had affected the design methods of architects and contributed to a very specific line of architectural enquiry in Melbourne. It should also be noted that no causal link is being claimed here, rather the fact noted that in previous histories of postwar Australian architecture, the impact of war has been over-

looked and not seen as a potential design source (one amongst many) for Melbourne's original contributions to a postwar Australian architecture.

Postwar practice and the high-rise building

Perhaps most significantly and surprisingly, the implications of wartime uses of timber can be seen in the most urbanistically influential of postwar structures: the glazed curtain wall skyscraper. Through a complete revision of production technology, material and labour mobilisation, and an associated aesthetic that was transferred from the wartime use of timber to the repetitive glass and steel façades of the postwar city, architects began to turn wartime experience to the task of building for the new postwar commercial world.

In Melbourne (and largely in Australia), the advanced design of the postwar skyscraper was pioneered by Osborn McCutcheon and his staff. McCutcheon had held the position of Chief Architect of the US Army Corps of Engineers in the SWPA from 1942–4. War was a time of revelation for McCutcheon as the development of repetitive building systems and programmes of mobilisation were crucial to the efficiency of the wartime enterprise. Methods and processes of prefabrication, dry systems of construction, and the co-ordination of teams of specialists combined with efficient systems of delivery were paramount. War was a time when the modernist dream of the machine was realised, when the construction industry was forced to match the pressures of military mobilisation at a scale not experienced by any previous conflict. Indeed the mechanisation of World War II was the



Figure 16. Yuncken, Freeman Bros., Griffiths and Simpson, Sidney Myer Music Bowl, Melbourne (1956–9). Photographer unknown, c.1959. (Held in collection of Philip Goad.)

impetus for an entirely new aesthetic of postwar architecture that US firms like Skidmore Owings & Merrill, architects of numerous wartime projects, would take up with alacrity. It was a modernist aesthetic not of cubist abstraction but one of system building, repetition and modular planning, and of which the glass curtain wall modulated by aluminium framing (a material refined in application by its use during World War II) was found to be the thinnest, lightest and most efficiently erected skin. At the conclusion of hostilities, McCutcheon invited

two other one-time members of the Corps of Engineers to join him in BSM's postwar practice. Douglas B. Gardiner and Phillip F. Pearce joined BSM as partners in 1945. Both had between 1942 and 1944 worked closely with McCutcheon in wartime operations and Pearce had extended this experience as Senior Planning Officer in the War Homes Division of the Commonwealth Government 1944–5.

From 1945, BSM transformed their practice techniques and procedures. The design aesthetic of the office was also transformed. After returning to

Figure 17. Bates, Smart and McCutcheon, ICI House, Melbourne (1955–8). Photograph © Wolfgang Sievers. Reproduced with permission.

private practice, McCutcheon travelled overseas to the United States, England and Europe. On his return, the firm commenced an intensive study of light-weight construction methods. Some of these principles were applied to new housing at BSM's Eildon Township (1950–56) and also to high-rise building design most notably the six MLC Building projects in Brisbane (1955), Perth (1956), Wollongong (1956), Adelaide (1957), Newcastle (1957) and Sydney (1957). McCutcheon introduced the notion of teams of specialists within a multi-disciplinary office. He was an advocate of integrated thinking and integrated systems. There were seven departments: architects; structural engineers; services; estimating; interior design; accounting; and general clerical and filing. He had, in effect, recast his Melbourne office as the US Army Corps of Engineers.

The exemplar of McCutcheon and his collaborator's search for the system built skyscraper was ICI House, Melbourne (1955–8) (Fig. 17) – a building essentially of dry construction and prefabricated parts that had emerged from an office which had been entirely restructured after World War II as teams of specialists by its principal director.¹⁹ It was as if the high rise building was a wartime structure. Repetition, the module, the kit of parts with glass and light-weight infill panels, and documented, assembled, and delivered in tendered packages – the analogy is altogether too neat but also compelling in that the similarities are startling. Once again, while there is clearly no unseasoned Australian hardwood being used in the design of the postwar glazed skyscraper, the question of influence is hard to ignore. Previous histories of the postwar skyscraper constantly hark back to the birth



of the skyscraper in nineteenth century Chicago or the visionary glass tower schemes (1921) by Ludwig Mies van der Rohe or the Van Nelle Factory, Rotterdam (1926–30). They dwell little on the influence of World War II and its associated and circumstantial aesthetic of engineered scientism. Even histories of the work of Skidmore Owings & Merrill, the American skyscraper firm par excellence, make no reference to the effect of war nor give reasons for the appearance of a building such as Lever House.

Modernist harbinger

Architectural histories often indicate that times of war are times of minimal architectural production. Yet one needs to ask: where do architects go during wartime and are their architectural services rendered obsolete? The effects and implications of war on the practice of architecture is a relatively little studied and little understood subject. Renaissance architecture included expertise in military architecture as a necessary and founding component of architectural practice. But twentieth century architectural histories have tended to overlook that pedigree and instead use the dates of war as benchmarks for changes in style rather than examining the direct effect and implications of war upon architectural practice; building technologies; project construction and delivery; and on an aesthetic that is associated with the mechanics of war. The prevailing canon of twentieth century architectural history has been to follow the international trend of examining architectural movements through the medium of the house, rather than through public, industrial or commercial architecture, and inevitably through the framework of progressive modernism rather than through frameworks of social and political change. In particular, the effects of wartime, when issues of building production and delivery take primary position over aesthetics, fashion and style, have not been considered. By examining such a modest material as unseasoned Australian hardwood, one can begin to speculate that far from being irrelevant, it was not only an essential war material, but it also was an important if unlikely Modernist harbinger.

Notes and references

1. Research for this paper was undertaken in June/July 1999 by the authors as part of an Australian Research Council Small Grant. Most of the historical data, archival material, and pictorial images were sourced from files held at the National Archives and Records Administration in College Park, Maryland, the library of the U.S. Army Corps of Engineers at Fort Belvoir, Virginia, and the Library of Congress, Washington DC.
2. Donald Albrecht (ed.), *World War II and the American Dream: How Wartime Building Changed a Nation* (Cambridge, Mass., National Building Museum and MIT Press, 1995), p. xvi.
3. Interest in architecture produced during war is considered in only a handful of publications, including: Keith Mallory and Arvid Ottar, *Architecture of aggression: a history of military architecture in North West Europe, 1900–1945* (London, Architectural Press, 1973); Paul Virilio, *Bunker archeology* (New York, Princeton Architectural Press, 1994); and Donald Albrecht (ed.), *World War II and the American dream* (Washington, D.C., National Building Museum; Cambridge, MA, MIT Press, c1995).
4. At the beginning of WWII, Australia's rail and road routes emanated principally from its handful of major cities, all of which were scattered around the coast. Although the major cities of Adelaide, Melbourne, Sydney and Brisbane were well linked by both road and rail, Perth's only land route with the rest of the country was by rail. Darwin and Townsville had no effective land routes at all. During WWII, at the urging of the Americans, some 8000 kms of roads were constructed, build-

ing crucial links across and through the centre of the country. A similar urgency was required for the construction of airfields, necessary because of the vast land and sea distances needed to be covered quickly: some 300 new airfields were created in the eighteen months to mid-1943. Huge munitions factories, graving (dry) docks, aircraft hangars and military bases (many of which are still standing and in some sort of use) were created in this intense period of building. In the (once) remote north of Australia, this infrastructure allowed not only strategic importance but rapacious postwar development. It brought the country, quite literally, together for the first time. See Allied Works Council, *Report on the activities of the Allied Works Council for the period February 26 1942 to June 30 1943* (Melbourne, 1943), and Allied Works Council, *Report on the activities of the Allied Works Council for the period July 1 1943 to February 15 1945* (Sydney, 1945).

5. Office of the Chief Engineer, General Headquarters Army Forces, *Engineers of the Southwest Pacific 1941–45, Volume I (Engineers in Theatre Operations)*, Reports of Operations, United States Army Forces in the Far East Southwest Pacific Area (1947).
6. Allied Works Council, *Report on the activities of the Allied Works Council for the period July 1 1943–February 15 1945* (Sydney, 1945).
7. These works are described in detail throughout the Allied Works Council Reports. See particularly Allied Works Council, *Report on the activities of the Allied Works Council for the period February 26 1942 to June 30 1943* (Melbourne, 1943).
8. These are the major types as identified by Gregory Nolan in 'Australian Timber Buildings of the Second World War', in R. Blythe and R. Spence (eds.), *Thresholds: Papers of the Sixteenth Annual Conference of the Society of Architectural Historians, Australia and New Zealand* (Launceston, SAHANZ, 1999), pp. 253–258.
9. Office of the Chief Engineer, General Headquarters Army Forces, *Engineers of the Southwest Pacific 1941–45, Volume VI (Airfield and Base Development)*, Reports of Operations, United States Army Forces in the Far East Southwest Pacific Area (1951).
10. Nolan, 'Australian Timber Buildings', *op. cit.*, p. 257.
11. Notable existing examples of igloo structures built during WWII are at Werribee, VIC, Dubbo, NSW, and at Amberley, Archerfield, Atherton, Eagle Farm, Macrossan and Rocky Creek, all in Queensland.
12. Philip Goad, Chapter 3 – The Prefabricated House: Dream or Reality?, 'The Modern House in Melbourne 1945–1975' (PhD Dissertation, University of Melbourne, 1992), pp. 3/16–3/29.
13. Robin Boyd, 'The Nation's First Problem: Nothing Can Prosper Until Our Attitude to Housing Changes', *Age*, 1 March 1950.
14. Philip Goad, 'Mary Kathleen and Weipa – Two Model Mining Towns for Postwar Australia', *Transition*, 49/50 (1996), pp. 42–59.
15. Joan Ockman, *Architecture Culture 1943–1968: A Documentary Anthology* (New York, Rizzoli, 1993), p. 18.
16. 'Ten Models by Fifth-Year Students', *Architecture* (January 1950), pp. 25–28; Hilary Lewis, 'Planning with Models', *Australian Home Beautiful* (March 1950), pp. 22–25.

17. Philip Goad, 'Optimism and Experiment in Melbourne: The early works of Peter McIntyre 1950–1961', *Architecture Australia*, 79, 5 (June 1990), pp. 34–53.
18. Mareeba Public Hall is heritage listed as part of the Australian Register of the National Estate. See 'Mareeba Public Hall' at <http://www.heritage.gov.au/ahpi/>
19. Philip Goad, 'ICI House: "Australia's first skyscraper"' in Jennifer Taylor (ed.) *Tall Buildings in Australia 1945–1975* (Sydney, Craftsman House, 2001), pp. 174–189.

Part 6

The sociology of architectural practice

Changes in the nature of the transaction between architects and their patrons or users are frequently to be found reflected in changes to the definition of the types of knowledge which are said to be essential to architectural practice. There are three papers here in which such changes are investigated and their social implications drawn out.

Richard Patterson reassesses the significance of Vitruvius' Ten Books, suggesting that their importance lies less in their revelation of what architects did in his day (on this, the Ten Books are, indeed, quite uninformative) than in their apparent rejection of the form and content of previous attempts to describe the art of architecture. Whereas his Greek predecessors appear to have written in deliberately hermetic architectural terminology, Vitruvius set out, modelling his treatise upon the Ciceronian principles of rhetoric, to make of architecture a discursive topic accessible to anyone with a good general education.

The paper from Felicity Scott examines the case of Bernard Rudofsky, a whole-hearted European modernist who believed that everyday life, and, with it, the forms of architecture, should be subjected to a rigorous and unbiased scrutiny upon the basis of a comprehensive study of human precedent. In the United States, where Modern Architecture had, only a year previously, been introduced to the general public as definitively a matter of style and technical development, ideas like this appear to have sunk without a trace.

Looking at the changes and continuities associated with the replacement of the term 'colonial architecture' with the apparently more neutral 'tropical architecture', Hannah Le Roux shows how pre-existing channels for the dissemination of specialised knowledge (appropriate to the design of buildings for humid tropical regions) perpetuated a centralised, metropolitan professional structure and the perception of 'tropical architecture' as generic, taking little account of cultural or political variations on the ground.

What Vitruvius said

Richard Patterson

Vitruvius's *De architectura* has long been subject to critical commentary on the grounds that its language is irregular and even untranslatable, that its technical treatment of the Orders is incomplete and inconsistent, and that its organization does not present its technical material in the most coherent way. Yet, it has also been referred to as the origin of the theoretical basis of architecture through its citation of Greek metaphysical concepts as the grounding principles for an architectural science. This paper argues that Vitruvius's substantial contribution lay not in theoretical speculation but, through the invention of technical discourse, in the introduction of critical values to 'technical' matters and, through the submission of technical matters to the dynamic of language, in the constitution of technology as a developmental process.

... the analysis of codes perhaps offers an easier and surer historical definition of a society than the analysis of its signifieds, for the latter can often appear as trans-historical, belonging more to an anthropological base than to a proper history.

Roland Barthes *Image Music Text*

We cease to think when we refuse to do so under the constraint of language, we barely reach the doubt that sees this limitation as a limitation.

Friedrich Nietzsche *The Will to Power*

Vitruvius's *De architectura* (ca. 30 BC) is the oldest surviving treatise on architecture. Amongst ancient works concerned with technical topics, it was singular in its project to ground that complex set of technical practices categorized as 'architectural' in abstract, predominantly Greek metaphysical principles. It is for this reason, it has been suggested,

that it alone, amongst the treatises on architecture mentioned in classical writings, managed to survive into the modern era. In the practice of architecture, however, its influence has been relatively modest. During the Renaissance, it was the later and derivative commentator Palladius Rutilius Taurus Aemilianus (ca. AD 400) who was more frequently referred to.¹ Then, as in all periods, architects sought inspiration from authors whose language and style addressed their own preoccupations, interests, and orientation. There was obviously something attractive to the Renaissance mind about the way in which Palladius limited his discourse to the reduced scope of what we might now refer to as the technical. Perhaps for this reason, aside from a certain influence on the language and concepts of John Dee's 'Preface', Vitruvius did not appear in English until the early nineteenth century.² *De Architectura's* influence was, however, more substantial as a model of a certain textual strategy.

Discursive yet intermittently systematic, relatively open, and formally critical, Vitruvius codified a discourse which led to what we now call 'science' and 'technology'. Indeed, he may be said to have constituted 'technology', if by 'technology' we mean a mode of thinking about making things which is motivated by, and subject to criteria originating in discourse 'external' to the issues which such manufacture conventionally presents. Technology, far from being a natural outcome of the character of things, is the result of a certain codification. It is the result of a system of protocols, governing presentation and justification. This is not to say that technology operates without knowledge, but that this 'knowledge', both as know-how and propositional knowledge, is used but intermittently and, indeed, vicariously. Technology is not grounded in the autonomous objects pursued by science and has no isomorphic version as 'theory'. It is an eclectic device of human creation; its laws are conventional and convenient; its being, furtive. The world it creates may be nonetheless substantial for all of that. But the greater knowledge that technology provides of the world is not so much an openness, an intimacy of understanding or knowledge of essences as their opposite: a withdrawal from the world into a particular mode of discourse. Technology is, in its way, but a trope. The elements of technological subjects do not arise so much from theoretical grounds as from the code, the unconscious discursive structures that constitute them.

Architecture was the first subject concerned with making things with one's hands in which these unconscious discursive structures were laid bare as

text. Conventional wisdom has it that subsequent to Vitruvius, the value and historical force of architecture lay in the example it set as a form of practice grounded in metaphysical theory, to the truth which it was deemed thereby to embody literally and figuratively. As model and example, its value so it has been said also lay in the principle it established for other technologies: for the successful development of 'means', understood and argued according to sound metaphysical truths, that is to say, according to the criterion of transcendent objectivity.

'Architecture' illustrated the value and power of the critique and evolution of technique over mere artisanal convention in a manner for all to see. Similarly, it came to be the site for the expression of metaphysical theories and the enhancement of objectivity, not merely 'didactically', but as material function and rigorous moral imperative. Theory, objectivity, metaphysics and architecture came to be accepted as relatively unproblematic representations of each other. They constitute the historical basis of a major theme in Western culture involving the articulation of ultimate criteria in objective, 'metaphysical', or 'scientific' terms, and *vice versa*, technological development came to be seen as but a closer reading of the book of nature, progress a spin off of the inevitability of being, and technical creativity itself an event of measured systematic surrender.

While *De architectura* is on 'architecture', the material that it covers is much broader, including all forms of mechanics, hydraulics, sundials and music. Amongst ancient works similarly concerned with technical topics (cf. Hero of Alexandria), *De architectura* is universally acknowledged to have

been singular, for its time, in the use of theoretical grounds for the arguments that it put forward. Vitruvius has frequently been cited as the original classical authority on rule-based architectural systems and, through his clear formulations, as having anticipated the framework within which architecture and, by way of precedent, all subsequent technologies came to be seen as objective 'in themselves': 'things' to be understood and manipulated more effectively on the basis of theoretical models.

But Vitruvius's use of abstract principle is more complex and more interesting than such a simple, naturalist reading, and his use of metaphysical material is not so straightforward, nor so modern, as most commentary on Vitruvius has attempted to make it. While it has become rather more common to note his use of the art of rhetoric as the borrowed origin of the order that he imposed on his technical subjects, the force of most critical writing on Vitruvius lies in the claim that his achievement resides, as noted above, in pointing to a clear theoretical link between architecture and metaphysical principle. The argument of this paper lies in the opposite direction: that the power in Vitruvius's work lay in the artificiality of his linkage between technical skills and rhetoric. Here it is argued that the origin of 'technology' does not lie in systematic, metaphysically grounded theory and theoretical understanding but in the opening up of technical skills as topics to the discursive mind. That it is the discipline of discourse that 'invented' the technical imagination.

Critics of Vitruvius, who would argue against his personal achievement, have most frequently pointed to problems in his use of language, partic-

ularly in the curious way he used and manipulated terms. As early as the mid-fifteenth century, Alberti commented that Vitruvius's language was 'Latin to Greeks and Greek to the Latins'.³ For the greater part, Vitruvian historiography has been of the opinion that the language of *De architectura* is barely Latin at all. But while the tenor of his text may be artless, it is nonetheless and ironically the very art that his written language lacked that he intended to transmit to building. In keeping with apologists for his rhetorical inspiration, we might note the possibility, following Cicero's principles of propriety, that Vitruvius's use of language, ritual apologies notwithstanding, might best be understood as an example of the 'ethical' selection of a style, the selection of a rhetorical level of delivery or *executio* as would have been appropriate to the subject of building and making.

Granger, one of Vitruvius's twentieth-century translators, has suggested that his language was close to the everyday spoken Latin of his time, as it has a clear affinity with the graffiti of Pompeii (AD 79).⁴ Vitruvius himself, while apologetic for the gracelessness of his writing style, was nonetheless erudite, as we can see from the sheer control he had over his material. But despite the apparent clumsiness of his style to our eyes, there is much of his thought and his declared intentions that was derived from rhetorical treatises, and in particular from those of Cicero. From the *De officiis*, for example, he transcribed not only formal structure, but also such Stoic moral precepts as the concept of *decor*, or 'appropriateness', a concept that he introduced as a central criterion in architectural judgement.⁵ That Vitruvius's ambition was clearly

greater than the compilation of yet another *aide-mémoire* on building technique is demonstrated by the inclusion of such critical values.

Previous architectural treatises, as that by the Greek Hermogenes, had in all probability been technical manuals of a type mostly associated with the Museum of Alexandria.⁶ As such, they were intended largely as reference works in the form of lists, tables and diagrams. They were intended primarily for practitioners, and were to some degree esoteric documents: they were dependent upon prior education or some form of initiation into the significance of their contents. Much of Vitruvius does fit clearly into this tradition. As textual critics have noted, parts of his work seem to have been lifted from various of these prior Greek manuals and, further, much of what he wrote appears in many instances to be little more than transcribed lecture notes.⁷ In his nomenclature, he maintained the strictly technical, Greek terms of his prototypes, fostering the view amongst modern critics and historians that he was essentially conservative and Hellenistic in his taste. But what one should note from the outset is that what this treatise does most consistently and strictly is precisely to set up this nomenclature: that is, the beginnings of a *Latin* nomenclature, along with a general framework for practice. What (on the contrary) he does *not* do with such precision and consistency is set out the rules for the geometrical and numerical basis of architecture, at least not with consistency and rigour, as the history of all those many frustrated attempts to reconstruct his examples visually has so amply demonstrated. But perhaps historians have simply been trying to understand Vitruvius in the

wrong places by imputing greater significance than is justifiable to the 'technical' and 'theoretical' principles with which he was purportedly concerned. Certainly, Vitruvius marshalled technical and metaphysical principle in his arguments, but primarily as illustrative metaphor. At the time of its writing, the text's prescriptive and rule-based mentality concerning composition would have been entirely contrary to the 'free-wheeling licence' of his contemporary architects and builders. But it was a radical conservatism, much more than prejudice, having to do with the strategic motives that brought him to write. His concern was twofold. Initially, as I note, he saw it as his pre-eminent task to bring architecture into standard Latin discourse. Prior to Vitruvius, 'architecture' stood outside standard discourse. Elements and topics of architecture did not have the proper names, and as such could not be properly emulated. There could be no basis for establishing the criteria of decor. There could be no meaning, narrative, or content – no *historia*, as he called it. These were the primary issues with which he was concerned in the construction of a treatise on architecture. It is only subsequently that he took up the issue of such secondary matters as number and measure: that is, when he began to consider those particulars concerned with elocution, execution, or 'diction'.

Vitruvius does not seem to have recorded or systematized best existing or previous aesthetic practice. He did not write from an empirical basis except with reference to construction and materials. His comments about 'design' are fragmentary and general. Similarly, the architecture that came after him seems to have remained relatively

unaffected by what he wrote. He neither took from, nor provided for, what we might call practical design. In the face of such comprehensive failure, then, the question that remains worth contemplating is why this treatise, written in a vernacular style, not only simply survived into the modern era, but, more substantially, became the prototype of all later technical writing.

To reiterate the point, it was not in its rule-based, metaphysical, or technical content that *De architectura* was in any sense innovative. Vitruvius's identification of the principles of universal harmony in the appearance of a harmonious building would have surprised none of his readers. Metaphysics was a commonplace of explanation. What was not commonplace and what was innovative was the use of a discursive style of writing in the construction of a technical text. What was not commonplace was the application of linguistic and rhetorical values in the evaluation and formulation of criteria in technical matters. Vitruvius's innovation did not lie in the content of his writing; it did not lie in theory or in any attempt to situate architectural decisions in metaphysics; it lay in the very discourse out of which he wrote. What Vitruvius achieved that was of lasting value was not architectural metaphysics, but architectural discourse. What he ultimately achieved of historical importance was not the systematic setting-down of architectural theory or architectural meanings, but the very invention of technical discourse itself in not only the submission of technical practice to the disciplines but, much more importantly, the creative possibilities of language. By submitting material production to the taxonomies, disciplines and potential disruptions,

perversions, and distortions of language, Vitruvius opened material production to the possibility of intentional material innovation in the creation of new expression: that is, in the creation of new 'sentences'. Again, technology was born not through a 'discovery' of metaphysics within the technicalities of production, but through the submission of technical activities to the discipline of speech, style, criteria of judgement, ethics, and politics. Technology does not have an objective existence; it is only technical practice that comes to life as language. To 'think' technologically is to do so under the constraint of language; we cease to think technologically when we refuse to acknowledge the origins and creative force of technological discourse. We even barely reach the doubt that sees this limitation as a limitation.

In the introductory section of *De architectura*, Vitruvius made it clear that his purpose in writing had been to contribute to the growing programme of public works initiated by Augustus, to whom his text was dedicated. Vitruvius stated that when he wrote the treatise he was already an old man, that he had been known to Julius Caesar, and that he had enjoyed the preferment of Augustus's sister, Octavia. He noted that his career had been in civil architecture and that he was adequately provided for in his retirement. *De architectura* was intended not to obtain pecuniary gain for its author, but to advance Vitruvius's reputation and, as a polemical and didactic tract, to lobby for improved standards in Roman building.⁸ To improve civic standards, indeed, to invent a new, disciplined and meaningful civic environment, one did not need to write a technical manual. One needed a polemical

document, a document capable of interjecting into formal debate, a document in such a form as to be meaningful to an intended audience. What made *De architectura* a lasting contribution to Western civilization quite simply was that this polemic took the form of a treatise that, according to Cicero, meant 'to divide the *entirety* of a practice into its general classes'.⁹ But to place the entirety of a practice in a written document would also have the effect of annihilating its esoteric character. Vitruvius's innovation lay not in architecture as metaphysics, but in presenting architecture in a new, explicitly public, rhetorical format. Esoteric ritual was subverted by the rhetorical format which, in its turn, came to constitute the framework of practice. Practice in this way became 'reflective'. For the first time, the construction of cities, buildings and technical apparatus was removed from the control of esoteric practices and brought into an (albeit elitist) public domain.

Much of the criticism that has been made of *De architectura* has concerned the structure of the division and apparent admixture of topics. But this misconstrues the moment of the text: the fact that *De architectura* was intended as a codification not of the 'art' of building as it was practised, but of the modes of discourse that might be employed to capture its discontinuous technical rigours and present them in a form susceptible to standard, critical, rational judgement. What the narrative does not include are the topic headings; what is included are all the discursive examples and annotated detail. One has to step back to find the structure. In the absence of a regular discipline or codification of 'architecture' Vitruvius has invented a set of chapters that echo the

structure of a rhetorical treatise in a similarly ascending scale of complexity. This can be demonstrated by summarizing the implicit topics of Book I:

- I The work of the Architect
- II Nomenclature
- III The Parts of Architecture
- IV The Choice of a Site
- V The Demarcation of Civic Boundaries
- VI The Interior Structure of a Settlement
- VII The Location of Communal Facilities

In other words:

- Chapter I deals with the scope and nature of the architectural field.
- Chapters II and III deal with taxonomies, or the art of architecture.
- Chapters IV–VII deal with strategies, genres and methods.¹⁰

Vitruvius justifies the sequence in which he presented his material in a curious way. He notes that he began with a discussion of the 'work' of the architect (a description of what an architect deals with or holds as a model of his expertise), a nomenclature, a listing of building types, an anecdote on the history of building practices and, only after this, a section on the fundamental properties of matter and the characteristics of building materials. Again, this is not a 'theory' relating material practice to metaphysics. Vitruvius's strategy for devising the general classes of architecture would have been normal in the classical period as an articulation of a subject according to its general

classes: classes, that is, not of its processes, but of how it is best submitted to description, critique, and control. It relies on a method that is typical of classical scholarship: general descriptions concern typical categories, topics or commonplaces – here either building types or constructional practices – in which the fundamental form or nature of the topic is given for ‘emulation’ that is to be adapted, reconfigured or transformed according to rules worthy of its exemplar.¹¹ It is uncertain exactly how ‘rules’ would have been implemented before Vitruvius. Most probably they would have operated through rituals and forms of practice, established, traditional, and esoteric. Vitruvius’s innovation was to transform those practices and their associated terminologies not into metaphysics but into ethical rules and learned discourse. Through configuring architecture as an ‘art’¹² it was his explicit intention to render it accessible not only to builders but to *omnibus sapientibus* (all those acquainted with the true value of things, the wise and the sagacious).¹³ But it is in his statement regarding the scope of his project that he reveals his unique vision: ‘In these books,’ he states, ‘are all rational disciplines disclosed.’¹⁴

While Vitruvius’s debt to Cicero is now generally acknowledged, what has perhaps not been fully explored is the extent to which Cicero’s influence so deeply structured Vitruvius’s thought and, as such, formulated the inner tension of what came to be recognized as technological discourse. Technical terms, nomenclature and tradition in Vitruvius, as noted above, were taken from the Greek and largely from Hellenistic Greek practice. But technical terms, nomenclature and tradition

were merely the ‘things’ that Vitruvius properly sought to emulate. The framework into which he placed them: the systematic means by which he transformed and manipulated them are repeatedly, obsessively, Ciceronian. The key lies in 1,1,3, at the very beginning of the treatise, where Vitruvius discusses the issue of signification:

‘Both in general and especially in architecture are these two things found: that which signifies and that which is signified. That which is signified is the thing (*res*) proposed about which we speak; that which signifies is an indication (*demonstratio*) of the same thing explicated by reasoned (*rationibus*) erudition.’¹⁵

The use of terms based on the root *ratio* has led many translators to elide the use of ratios and proportions with the central function Vitruvius seems to give to this term. But ratio was rarely used as a reference to number.¹⁶ Ratio signified something closer to ‘rational’ or the German term *Rat*, or ‘council’. It could signify ‘a reckoning, account, calculation, computation’, or it could refer to a transaction or, in a way that was a particular favourite of Cicero’s, to a ‘matter’, as in a ‘business matter, an affair’.¹⁷ The use of *rationibus* calls to mind a reference to a particular kind of mental activity involving calculation and a principle of agreement and equivalence. ‘Reasoned’ signification requires reflection and a robustness something like the terms of a commercial agreement. If Vitruvius were ever to speak of the principle of rationality in architecture as a property of number, it would only be in an exemplary, metaphoric way.

When he speaks of numeracy, he does so only by way of reference to one of the skills or sciences that the architect must be competent in. 'Ratio', in this sense, refers to a principle of soundness, but not (literally) to a regulating model for the process of 'design'. When he discusses the role of the architect, his range of reference is even broader. When he uses the term again at 1,2,2 (*picta rationibus*), he clearly means something along the lines of 'realistically'.¹⁸ Again one turns to Cicero, in this instance to his description of the five parts of rhetoric from *De inventione*, to clarify something of the way in which Vitruvius is thinking:

'Invention (*inventio*) is the excogitation of true things (*res*), or things similar to truth to render one's cause plausible; disposition (*dispositio*) is the arrangement in order of the things thus discovered; elocution (*elocutio*) is the accommodation of suitable words to the invented (things); memory (*memoria*) is the firm perception in the soul of things and words; pronunciation is the moderating of the voice and body to suit the dignity of the things and words.'¹⁹

From this perspective, one can begin to see more clearly why Vitruvius has introduced the issue of signification to a discussion of architecture. Cicero's *res* are the signifieds. What he opposed as words and things, signifiers and signifieds, Vitruvius opposes as things and the way they are represented, explicated and justified, spoken of. For Cicero, 'things' are selected (emulated) (Part I) and manipulated (Parts 2–5). For Vitruvius, these things are ('that which is signified'), and are manipulated

for presentation to the mind ('that which signifies'). In Vitruvius, the 'things' are the elements and motifs, the proposals of architecture, of which he discusses many aspects of the possible and correct range of relationships. He does not discuss appearance, nor does he prescribe overall solutions for buildings. What, on the contrary, the whole of his text is concerned with is the relatively systematic presentation of the allowable transformations and manipulations that may be made of the emulated bits of architecture. Then he is concerned under the principle of *dispositio* in the ways in which these elements can be brought together. At 1,2,1, he notes, for example, that '*Architectura autem constat ex ordinatione. . . . et ex dispositione*', followed by citation of terms related to composition (*eurythmia* and *symmetria* – the Greek words for two different types of proportion) and decor, by which he refers to propriety: to suit the dignity of the building.²⁰ In other words, Vitruvius's 'invention' of terms, his selection of terms, is in accordance with the classical sense of 'invention'. His organization of the discipline of architecture is in accordance with the classical sense of classification and disposition: that is, by way of the borrowed taxonomies, tropes and metaphors drawn from rhetoric.

The key, however, lies more centrally in the direct way in which Vitruvius drew on rhetorical devices to systematize and present the heterogeneous aspects of building practice, to bring Cicero's model of argument into the armoury of the architect.²¹ Additionally, Vitruvius seems to have wanted to expropriate, so to speak, the perspective of the orator in order to provide the architect with a

means for authoritatively structuring the relationship between technical matters and his audience in a way which had never before been attempted. The model, again, would appear to have been Cicero:

'... your natural science itself, your mathematics, and other studies which you just now reckoned as belonging peculiarly to the rest of the arts, do indeed pertain to the knowledge of their professors, yet if anyone should wish by speaking to put these same arts in their full light, it is to oratorical skill that he must run for help.'²²

What was new in this framing of technology above and beyond the technical manuals of the past was a rendering, again, of technical discipline in the form of discourse.

It is in the opening chapter of the first book, where he delineates the 'work' of the architect, that Vitruvius produced his most interesting or problematic terms, *ratiocinatio* and *fabrica*, which he claims to delineate in what architecture consists:

'The forms of expertise of the architect are embellished by many disciplines and varied learning – by which all things are examined and judged – which are individually brought to perfection within their particular arts.²³ The work consists in *fabrica* and *ratiocinatione*. *Fabrica* is sequential and also established, deliberative practice, brought to perfection by the hands, out of a material of whatever nature is appropriate to the work, according to the intention (*propositum*)²⁴ of a representation (*deformationis*).²⁵ *Ratiocinatio*, on the other hand, is (understanding) how things are made with know-

ledge and skill: both (in knowing) how rational proportion can be demonstrated and also in having the power of explication.'²⁶

A variety of words crash together in this paragraph in a way which has perplexed and frustrated all attempts to interpret and safely render it as modern, vernacular text. The translator will have had a degree of trouble with the word *propositum*, as 'an argument' or the first premise of a syllogism' as it would have carried too much of a sense of oratory to have been suitable in the context of instructions concerning bricks and mortar. Its rhetorical origins would have been suppressed for the sake of contemporary sensibility. It became 'intention' or 'plan.'

Deformationis, too, has been variously translated as 'design' or 'representation'. It refers to a 'deforming, disfiguring, defacing', of as a verb, to 'bring into form'. to distort, in other words, to kick into shape. The use by Vitruvius of *deformo* nonetheless implies a mental construct assuming the pre-existence of the form. Vitruvius appears to have seen the activity of representation or design as the 'deformation' of a thing, a selection and then a swerve, in short, as a trope. In all likelihood, this usage of *deformo* would have been conventional. But 'deformation' carries much more rhetorical and metaphysical baggage than our modern 'design' or 'representation', and the sense in which these, to our modern ears, latent significations of deformation draw the *Architectus* in the direction of the *Rhetor* and of language would have been entirely in harmony with the thrust of the Vitruvian text.

Modern critical tropology typically attempts to elucidate the identity of repressed tropes latent in that logical demonstration and literal description we associate with truth. 'Tropic is the shadow from which all realistic discourse tries to flee. This flight, however, is futile; for tropics is the process by which all discourse constitutes the objects which it pretends only to describe realistically and to analyze objectively'.²⁷ Yet in this analysis, the moment at which *techné* became subject to troping remains historically opaque. Against the 'accidental and inevitable' that is to say the 'realistic' model of technological development, there is only an argument for a culturally mediated shaping of imaginative forms, and one which is somehow unconsciously directed or structured. In Vitruvius, we can see that rhetorical theory is not merely useful interpretatively in tracing the unconscious or frivolous motives underwriting scientific or technical investigation, but that it was in fact the conscious imposition of rhetorical structures on technical practice which initiated and indeed constituted that investigation. *Ratiocinatio*, strictly speaking, is a rhetorical 'trope' or 'figure'. 'Trope' and 'figure' are general terms referring to any striking or arresting use of language beyond the range of normal usage. Tropes are generally words that rely on a distinctive change in meaning to obtain their rhetorical force. Cicero preferred the use of 'trope' in referring to transformations limited to single words. When discussing the use of artificial patterns (more than one word) for the sake of emphasis, he preferred to use the word 'figure'.²⁸ Quintilian differentiated between figures of speech and figures of thought. 'A figure', he notes, 'is the term employed when

we give our language a conformation other than the obvious and ordinary', but ... 'does not necessarily involve any alteration either of the order or the strict sense of words.'²⁹ The generation of 'figures' involves both the recognition of the typical in the specific and the description of the particular distortion which characterises the particular:

'For the term [figure] is used in two senses. In the first it is applied to any form in which thought is expressed, just as it is to bodies which, whatever their composition, must have some shape. In the second and special sense, in which it is called a *schema*, it means a rational change in meaning or language from the ordinary and simple form, that is to say, a change analogous to that involved by sitting, lying down on something or looking back.'³⁰

'Figures' concern the construction of something new out of what exists and has been selected. Cicero lists *ratiocinatio* amongst his 'figures', indicating its meaning as 'reasoning by questioning' (cf. *interrogatio* or simple questioning).³¹ A review of the term in Lewis and Short is illuminating, for they give *ratiocinatio* a total of 26 lines, 22 of which cite several occurrences in Cicero and Quintilian, while four (semantically incommensurate with the rest) are from Vitruvius.³²

The 'work' (*opera*) may be made up of *fabrica* and *ratiocinatio*, but there is no suggestion in Vitruvius that the work of the architect should be similarly so constituted. The architect is required, he states, to have a knowledge of the arts concerned with *fabrica*, but he explicitly states that the architect is not the most competent in them. It is hardly

likely, writing about building in a slave society, that Vitruvius would suggest that architects should get their hands dirty. Indeed, Vitruvius does not even require architects to be competent at 'drawing'. When Vitruvius writes about 'drawing', he uses (again) a curiously metaphorical term, *deformationibus grammicis*, meaning perhaps a 'line drawing'³³ or, as in the section on the forms of skill or knowledge required of an architect, he uses the term *graphidus* (pen or pencil, trans. 'drawing'), which, he notes, enables one to easily paint an image representing the shape of the work.³⁴ While suggesting therefore that drawing might be helpful and possibly useful, what is clearly required are verbal and organizational skills. What the architect must do is instruct through 'representing' what is required in the mind of the artisan, for the instruction is nothing other than the specification of the necessary outcome of a known form of deliberative action. The method of representation depends on the skill of the artisan and on conventions in the division of labour.

The proper realm of the 'architect' as a generic term is not therefore *fabrica* but *ratiocinatio*. *Ratiocinatio* is the key principle in the organization of the various arts engaged in *fabrica*. The architect, in other words, is concerned precisely with the generalities or universals of interrogative reasoning, explication and demonstration, organization and direction deployed by the orator in obtaining agreement through 'reasoned questioning'.³⁵ Vitruvius's proposals are substantially about the correct social positioning of the architect (as noted, that of the orator) and the correct taxonomy of concepts and terms to be used in the organization of production

in all technical activities. This is made abundantly clear in Vitruvius's critique of Pythius. Opening with a commentary on the dual nature of all arts, rather than employing the term *fabrica*, he notes 'the work itself (*opera*) and its *ratiocinatione*', stating that 'One of these is appropriate to those who exercise the individual arts, namely, the execution of the work (*operis effectus*), the other, which is common to all educated men (*omnibus doctis*), is its rationality (*rationem*).' The architect is the bridge, rendering *opera* according to certain explicit precepts of a 'commonality of reason', which he makes clear:

'Likewise there is a question common to astronomers and musicians about the sympathy of the stars and of the concords, fourths and fifths, in quadrants and triangles, the geometry of vision, which in Greek is called *logos opticos*, as for which the many things of all doctrines are all brought together, *at least insofar as it is a matter of argument*.'³⁶

Many scholars have been led by the simple binary opposition of this form to seek out other similar yet more familiar oppositions by which to render their translations. Standard has been the response that these terms are somehow just a version of Aristotle's *techné* and *epistémé*, which themselves might be somewhat problematically stated in modern form as 'theory and practice'.³⁷ The issue is of some significance, for on the outcome hangs the degree to which the practice of architecture and indeed the origin of technology can be most usefully studied through either hermeneutic or epistemological models.

An initial line of enquiry might simply be to ask why, if Vitruvius had actually intended to construct an epistemologically grounded technology, he did not simply refer to the Greek terms *techné* and *epistémé*. He was not shy when it came to citing the pre-Socratics,³⁸ and Greek terms occur throughout his text.

In its textual coding of the practice of building (and the various technical practices associated with civil architecture, including the construction of machines), *De architectura* constitutes architecture as the technical, material equivalent of discourse. From this arose the framework within which followed the explicit, conscious, rational correspondences between material practice and discursive signification. Through textual coding – not through a theoretically grounded knowledge – in other words, emerged a global claim to the control of technical practice. General classes of practice came to be set out as typologies: typologies of nomenclature, typologies of the proper objects of the forms of practice, or typologies of fundamental substances (one recalls in passing, Vitruvius's obsessive classifications of building materials). With the rendering of architects' 'work' as discourse, there emerged the model for the future of technical treatises in the marriage not of *techné* and *epistémé*, but of *techné* and *logos*.³⁹ In this conjunction, *fabrication* and *discourse* are not grounded in abstractions, but actually constitute that distinct ontological moment that we now refer to as *technology*. It is for this reason, for the singularity and irreducibility of that moment, that Vitruvius survived into the modern world. Yet the mode of that survival has involved an amnesia.

Memory of the submission of technical tradition to public discourse has been suppressed, initially by the hegemony of esoteric guilds in the Middle Ages, to be followed by the mystification of intellectual objectivity in the creation of the office of architect during the Renaissance, and subsequently in the adoption of 'technocratic' symbolic languages.

In the *De Diversis Fabricis Architectonicae* of M. Cetus Faventinus (AD 300), for example, rhetorical references are more explicit and categorical.⁴⁰ Faventinus's intention, stated in his opening remarks, was to abbreviate the work of Vitruvius, making it more clear, and aimed at an audience of slighter intellectual ambition. Faventinus does not wish to discuss the organization of all technical knowledge; he wants to write about sound building practice. His statements are more direct. In his second paragraph, he limits the scope of architecture by referring to it as an art, unlike Vitruvius, and by stating eight principles that are pertinent to it: 'For architecture is composed of eight parts, which are *ordinatio*, *dispositio*, *venustas*, *mensura*, *distributio*, *aedificatio*, *conlocatio*, *machinatio* . . .'⁴¹ Of these, the last three refer to practical skills of building, siting, and contriving. The first five reflect the canonic five parts of rhetoric, adapted to the cause of architecture. Faventinus claims them to be the equivalent of Greek terms.⁴² While these are the terms chosen by Vitruvius, their distinction is nonetheless unclear:

'order (*ordinatio*) is the disposition (*dispositio*) of the members of the building and consists of quantity, which the Greeks call *posotes*; quantity is the

manner in which the single members of a building respond to the effect of the whole work. Disposition is the apt arrangement of rooms . . .⁴³

Venustas is alone in the parts in that it cannot be rendered as a verb.

Perhaps it is due to the great system builders of the Middle Ages that such later, more formally distinct, artificial, and derivative works came to be preferred. They were so much easier to understand, and in their use of more consistent explanatory schema, even if to the detriment of a more inclusive content, more in keeping with the criteria of the time. In the modern, post-classical practice of architecture, however, *De architectura*'s influence was to prove to be relatively modest. During the Renaissance, it was an even later commentator, Palladius Rutilius Taurus Aemilianus (ca. AD 400), again, a follower of Vitruvius, who was more frequently cited.⁴⁴ During the Renaissance, the selection of a style of writing for architectural discourse did not necessarily require Latin.

If the lines of conceptual order had been redrawn by scholasticism, so too in another way had those of division of labour, as can be seen in the *Ten Books on Architecture* by L. B. Alberti, who articulates the architect's function in a startlingly different way from Vitruvius. In Alberti, the architect is firmly in ultimate control of technical processes, which he purports to understand, through calculation and measurement, more deeply than the artisans:

' . . . For it is not a Carpenter or a Joiner that I thus rank with the greatest Masters in other Sciences; the manual Operator being no more than an

Instrument to the Architect. Him I call an Architect, who, by sure and wonderful Art and Method, is able, both with thought and Invention, to devise, and, with Execution, to compleat all those Works, which, by means of the Movement of great Weights, and the conjunction and Amassment of Bodies, can, with the greatest Beauty, be adapted to the Uses of Mankind. . . .'⁴⁵

With Alberti, the architect is responsible for the construction of 'Works', meaning buildings and civil engineering, but is not concerned with the explication, control and organization of technical processes in general. In Vitruvius's *fabrica*, the artisan was not a mere instrument, but a practitioner with both a closer and a broader understanding and expertise in his art than that possessed by the architect. '*Fabrica*', after all, referred initially to the place in which an artisan worked and, metonymically, to what he did or produced. *Fabrica* referred to 'working with hard materials' with an established, and deliberative manual sensibility. While being a matter of substantial knowledge, *fabrica* nonetheless had absolutely nothing to do with reflective or critical activity, and was certainly not subject to progressive development by the artisans.

In this very different world, it is not surprising that translators had some difficulties with the signifying nexus of *fabrica* and *ratiocinatione*. The oldest published vernacular translations of Vitruvius do not as a rule translate these Latin terms at all, preferring to retain their original, and for modern etymologists, enigmatic term.⁴⁶ The first attempt to render them in translation was made by Ian Martin, in the

French in 1546/7, using the terms '*discours*' and '*fabrique*'.⁴⁷ (Daniel Barbaro, similarly, used *discorso* for his 1556 Italian edition of *De Architectura*.⁴⁸) *Fabrica*, while close enough to *fabrique*, meant explicitly to 'work with one's hands'.⁴⁹ But the use of the term 'discourse' did not command so obvious a meaning, as it required marginal commentary in the form of an explication of proportions and certain architectural terms.

Similar concerns reverberate through John Dee's search for the grounds and claims of architecture, in which he drew material from Vitruvius's language, methodology and conceptual order, for his 'Preface' to Billingsley's *Euclid* (1570). And we can already see at this early date how Vitruvius has been channelled in ways to suit the translator's other agendas. Dee was explicitly concerned to argue for the inclusion of architecture amongst the 'Mathematicall arts'. Indeed, as he would have it, all the aspects of an architect's practice would devolve on mathematics: 'By Arithmetike, the charges of buildings are summed together: the measures are expressed, and the hard questions of Symmetries, are by Geometricall Means and Methods discoursed on &c.'⁵⁰ For Vitruvius, *ratiocinatio* had the same function in a broader, less absolute, rhetorical context.

Even so, in Dee, Martin, Barbaro and Vitruvius, the architect's job is nonetheless discursive and twofold: initially, the architect must articulate technical processes and the meaning of building verbally to educated persons, and, secondly, the architect must translate the verbally expressed desires of clients into instructions to manufacture or construct. Amongst the moderns, this latter

point is predominant, argued entirely through the gate of mathematics as a medium both of communication and of thinking and meaning. In Vitruvius, the claims for architectural discourse are made in the context of the former. They are broader and more evocative. The point of Vitruvius's *ratiocinatio* is that it refers to a modality of discourse close to that of his interlocutors; with the moderns, that discourse became narrow and once again esoteric.

Dee's reluctance simply to give up the use of 'discourse' in the context of mathematical calculation is particularly revealing. Discourse had been linked to reflective, coherent thought, and to conversation and narration. Its quite special meaning was already evident in Chaucer, who used it in contrast with 'formal' intuition: 'It (intelligence) byholdeth alle thinges so as I shal seye by a strok of thought formely with oute discours or collacioun.' By the middle of the sixteenth century, its cognitive, verbal sense was established as meaning 'to pass from premises to conclusions'; it referred to 'movement upon an onward course' or a 'process or succession in time'. As a noun, it referred to 'conversation', 'discussion', 'confering' and 'narrative'. Discourse concerned a rational or structured 'passing' from one thought to another, discursively, indeed, 'by way of speaking'.⁵¹ As late as 1675, the identification of rationality with the power of language could still be made, as by John Wilkins:

'... the discerning of that connexion or dependence which there is betwixt several prepositions ... which is called ratiocination, or discourse.'⁵²

On this basis we may interpret Dee's project to be the reconciliation of discourse, number and power:

'And though the *Architect* procureth, enformeth, & directeth, the *Mechanicien*, to handworke, & the building actuall, of house, Castell, or Pallace, and is chief Judge of same: yet, with him selfe (as chief *Master* and *Architect*;) remaineth the Demonstratiue reason and cause, of the Mechaniciens worke. . . .'

Here we still note the standpoint of the rhetorician who, through his speaking, represents interests which are both more general and more specific than his own.

'Wherupon, he is neither Smith, nor builder: nor, separately, any Artificer: but the Hed, the Prouost, the Directer, and ludge of all Artificiall workes, and all Artificiers. For, the true *Architect*. is hable to teach, Demonstrate, distribute, describe, and ludge all workes wrought. And he, onely, searcheth out the causes and reasons of all Artificiall thynges. . . .'

Here, finally, it is bountifully clear that the active component of the work of the architect – to teach, to demonstrate, to distribute etc. – has again been transposed directly from that of the orator.

The tropes by which various discourses and the terms within which discourses are explicated may be used as markers of the frames of reference by which judgements regarding relative significance are determined. That is to say, the criteria by which 'rational understanding' is assembled can be mapped through etymological transformations associated with new divisions of labour.

The latter part of the sixteenth century marks the point at which the classical tradition, in which the concept of 'discourse' with its implications of indeterminability, was no longer deemed adequate in the explanation or justification of technical activity. It was in the ensuing period, in what has become known as the 'Scientific Revolution', when the effect of the reform of rhetoric initiated by Agricola and Ramus became apparent in what Ong has called the 'decay of dialogue', that material practice came to be seen as the imperfect, temporal expression of timeless, universal and objective abstractions.⁵³ It is only in this period that metaphysical representation in architecture supplants Ciceronian ethics.

Notes and References

1. Hugh Plommer, *Vitruvius and Later Roman Building Manuals* (Cambridge, Cambridge University Press, 1973): see p. 33 for arguments regarding dating of Palladius and Faventinus.
2. Gwilt, London, 1826.
3. R. Krautheimer, 'Alberti and Vitruvius', in M. Meiss *et al.* (eds), *The Renaissance and Mannerism* (Princeton, Princeton University Press, 1963), vol. ii, pp. 42–52; J. Onians, *Bearers of Meaning, the classical orders in antiquity, the Middle Ages, and the Renaissance* (Cambridge, Cambridge University Press, 1988), p. 33.
4. F. Granger, 'Introduction, The Language of Vitruvius', in Vitruvius, *De architectura*, trans. Granger (London and New York, 1927), p. xxviii.
5. Onians, *Bearers of Meaning*, p. 37.
6. A. Tomlinson, 'Vitruvius and Hermogenes', in

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7. *Ibid.* p. 72.
 8. Vitruvius *ibid* 1, Proem.
 9. Cicero, *De oratore*, I.xxiii.190.
 10. Cf. R. Krautheimer, *ibid.*
 11. W. Lee Rensselaer 'Ut pictura poesis: the humanistic theory of painting', *Art Bulletin*, xxi (1940), p. 206.
 12. Vitruvius, *De architectura*, II.ii.3.
 13. *Ibid.* I.i.18.
 14. *Ibid.* I.P.3: 'Namque his voluminibus aperui omnes disciplinae rationes.' Granger's translation is somewhat free: 'In the following books I have expounded a complete system of architecture.' Similarly, in 1.P.1 '... tantis occupationibus, de architectura scripta e magnis cogitationibus explicata edere, metuens, ne non apto tempore interpellans ...' was rendered as 'Amid such affairs I shrank from publishing my writings on architecture in which I displayed designs made to a large scale.' More probably, there is no mention of large-scale 'designs', but of great or large-scale thoughts explicated (with poetic intensity? – i.e. 'crowned with ivy').
 15. *Ibid.* 1.1.3: Cum in omnibus enim rebus, tum maxime etiam in architectura haec duo insunt, quod significatur et quod significat. Significatur proposita res, de qua dicitur; hanc autem significat demonstratio rationibus doctrinarum explicata.
 16. Charlton T. Lewis and Charles Short, *A Latin Dictionary* (Oxford, Clarendon Press, 1975), p. 1525
 17. *Ibid.*
 18. Orthographis autem est erecta frontis imago modiceque picta rationibus operis futuri figura.
 19. Quoted from Frances A. Yates, *The Art of Memory* (Chicago, 1966), p 9; ref. Cicero, *De inventione*, 1.vii.9: *res and verba.*
 20. Vitruvius, *De architectura*, 1.2.5: Decor autem est emendatus operis aspectus probatis rebus compositi cum auctoritate ...
 21. K. Sallmann, 'Bermerkungen zur Pädagogik Vitruvs', in H. Knell and B. Wesenberg (eds), *Vitruv-Kolloquium 17/18 Juni 1982 Technische Hochschule Darmstadt* (Darmstadt, 1984), p. 17: 'Er versucht einfach, das Argumentationsmodell Ciceros auf den *architectus* zu übertragen ...'
 22. Cicero, *De oratore*, I.xvi.61.
 23. Vitruvius, *De architectura*, I.i.1: 'Architecti est scientia pluribus disciplinis et variis eruditionibus ornata, [cuius iudicio probantur omnia] quae ab ceteris artibus perficiuntur.'
 24. Lewis and Short, *A Latin Dictionary*, p. 1471.: 'propositum ... A. A plan, intention, design, resolution, purpose ... B. The first premise of a syllogism, Cic. *de Or.* 2,3,215 ... 2. An argument ... 3. The main point ...'
 25. *Ibid.* p. 532: '1. deformationis ... a representation, delineation, Vitr. 1.1 ...). 2. deformationis ... a deforming, disfiguring, defacing ... 1. deformato ... to bring into form ... delineate,

describe.' Granger's rendering this term as 'drawing' appears to be somewhat restrictive in the context of Vitruvius's use of it elsewhere. At 5.6.9: '... quod tragicae deformantur columnis et fastigiis et signes reliquisque regalibus rebus ...' is better translated by 'wherefore the tragic is represented by columns and pediments and figures and other regal things' than 'The tragic are designed ...'. Similarly, 'on the other hand, the comic by private and meandering buildings ...' and, more emphatically, 'the satyric will be equipped with trees, caves, mountains and other rustic things represented in the shapes of garden topiary.' 'Agrestibus rebus in topeodi speciem deformati.' See note 28 *infra*.

26. Vitruvius, *De architectura*, I.I.I.: 'Architecti est scientia pluribus disciplinis et variis eruditionibus ornata, cuius iudicio probantur omnia quae ab ceteris artibus perficiuntur. Opera ea nascitur et fabrica et ratiocinatione. Fabrica est continuata ac trita usus meditatio, quae manibus perficitur e materia cuiusquomque generis opus est ad propositum deformationis. Ratiocinatio autem est, quae fabricatas sollertiae ac rationis proportione demonstrare atque explicare potest.'
27. Hayden White, *Tropics of Discourse, essays in cultural criticism* (Baltimore and London, Johns Hopkins University Press, 1978), p. 2.
28. Richard A. Lanham, *A Handlist of Rhetorical Terms* (Berkeley, Los Angeles, London, University of California, 1968), p. 101.
29. Quintilian, *Institutionis Oratoriae*, IX.i.4.7.
30. *Ibid.* IX.i.10f.
31. Cicero, *De Oratore*, IV.xiii.19.
32. Lewis and Short, *A Latin Dictionary*, p.1527: 'ratiocinatio ... I. In rhet. 1. An exercise of the reasoning powers, calm reasoning, ratiocination (opp. impulsio, a passionate feeling, impulse; cf. argumentatio): ratiocinatio est diligens et considerata faciendi aliquid aut non faciendi excogitatio, Cic. *Inu.* 2.5.18 ... 2. A certain form of reasoning, a syllogism: ratiocinatio est oratio ex ipsa re probabile aliquid eliciens quod expositum et per se cognitum sua se vi et ratione confirmet, Cic. *Inu.* 1.34.57 ... 3. A rhet. figure, reasoning in an interrogative form ... II.theory (opp. fabrica practice).' Morgan has used this sense, whereas Granger has struggled to produce a translation in which the original, rhetorical thrust of Vitruvius's text has been subsumed in modern, descriptive commonplace: 'The science of the architect depends upon many disciplines and various apprenticeships which are carried out in other arts. His personal service consists in craftsmanship and technology. Craftsmanship is continued and familiar practice, which is carried out by the hands in such material as is necessary for the purpose of a design. Technology sets forth and explains things wrought in accordance with technical skill and method.'
33. Vitruvius, *ibid.*, 3.Proem.4. The term *grammicis* seems to be a form of 'gramma ... a line of writing', Lewis and Short, *A Latin Dictionary*, p. 822.
34. Vitruvius, *ibid.*, 1.1.4.
35. In discussing the architect's need for writing skills, on the other hand, Vitruvius notes the skill and care required in the framing of contracts and the necessity of guaranteeing a proper

balance between two sides. In this legal focus, he implies that the architect must seek the ground common to all men, a ground, again, that is the moment of exchange. It is Vitruvius's Stoic sense of 'duty' here, leading him to the task of ensuring that each participant abides by the criteria of an explicit, legal rôle, without confusion and without improper advantage. This criterion of legal judgement is based, again, in *ratiocinatio*, by way of interrogative argument according, that is, to the criteria of a more general form of discourse.

36. *Ibid.* 1.1.16; final italics are mine.
37. E. Frézouls, 'Fondements scientifique, armature conceptuelle, et Praxis dan le *De Architectura*' in Herman Geertman and Jan J. de Jong (eds.) *Munus non Ingratum*, Proceedings of the International Symposium on Vitruvius's *De Architectura* and the Hellenistic and Republican Architecture, Babesch Bulletin Antieke Beschaving, Annual Papers on Classical Archaeology Supplement 2, Leiden 1989, p. 41. 'A quoi correspond le binôme principal fabrice/ratiocinatio? Sans reprendre une discussion engagée ici même, observons la prudence qu'elle nous conseillait il vaut mieux éviter d'assimiler ce couple à l'opposition greque classique entre technè et epistèmè.' Cf M. Heidegger 'The Question Concerning Technology' in *The Question Concerning Technology and other essays*, London: Harper and Row, 1977.
38. Vitruvius, *ibid.*, II.III
39. The identification of 'rationality' with the linguistic faculty was a commonplace of classical discourse. Cicero identified the essence of humanity in this way, without reference either to metaphysical speculation or to mathematics, proportion, etc. To him, '... the one point in which we have our greatest advantage over brute creation [is] ... that we hold converse with one another, and can reproduce our thought in word.' *De oratore*, I.viii.32; cf. note 52, *infra*.
40. Hugh Plommer, *ibid.*, p. 33: Plommer gives this date for Faventinus, whom he tentatively believes to have written approximately a century before Palladius [*infra*].
41. *Ibid.* p. 40.
42. 'For they called order *taxis*, disposition *diate-sis*, beauty and elegance *eurhythmia*, the measurement of units *symmetria* and distribution *oeconomia*.' *Ibid.* p. 41.
43. 'ordinatio est ergo membrorum dispositio, et constat ex quantitate ... quantitas est modus singulorum membrorum universo respondens operi. Dispositio est apta rebus conclavium institutio ...' *Ibid.* p. 40.
44. Plommer *Ibid.* p. 33 for arguments regarding dating of Palladius and Faventinus.
45. L.B. Alberti, 'Preface', *Ten Books on Architecture*, trans. J. Leoni (London, 1726).
46. Durantino, 1524; Caporali, 1536.
47. 'Architecture est une sciéce qui doit estre ornée de plusieurs disciplines, & diverses eruditions: car par le iugemét de ceste la sont examinez les ourrages que fefont par tous Artisans, aussi elle prouiet de fabrique, & discours, ou cōmunicatio & les ourriers out aucunes fois ensemble. Fabrique, n'est autre choseque commune & continuelle meditation de l'usage: &

ceste la se faicte manuelement de toutes especes de matiere qu'il est besoing de mettre en oeuvre: pour venir au point de la formation. Discours est le moyen par lequel on peult monstrer & donner aq entendre comment les choses se doinent faire par industrie, en gardant bonnes proportion.'

48. Oskar Bätschmann, 'Diskurs der Architektur im Bild', in Carlpeter Braegger (ed.), *Architektur und Sprache* (Munich: Prestel-Verlag, 1982), p. 11f. Bätschmann's argument is interesting in that he situates the origin of the theory of Western narrative painting in Barbaro's translation of *ratiocinatio* as *discorso*: 'Vitruvius Umschreibung von 'ratiocinatio' übersetzt Barbaro mit: 'Discorso è quello che le cose fabricate prontamente & con ragione di proportionione puo dimonstrando manifestare'. Wie aus Barbaros Kommentar hervorgeht, ist 'discorso' zu verstehen als Einübung und Äußerung des Urteilsvermögens, als Gerichtetsein des Bewußseins auf die Schönheit der Werke und als Suche nach der Gründen der Schönheit. Das Verlangen nach dem Urteilsvermögens heißt ein 'diuno desiderio', mühevoll ist die Erwerbung des 'potere giudicare, & approuare le opere de 'mortali', Mit dem Urteilsvermögen wird aber nur eines von beiden Prinzipien der Architektur erworben und für die Erwerbung des andern Prinzips, der 'fabrica', eine Voraussetzung geschaffen. Das Werk entsthet aus der Vereinigung beider Prinzipien, daher der Satze: Il discorso
- come padre, la Fabrica è come madre dell' Architettura! Alberti's *De re aedificatoria* was published in 1486, the same year as the first printed edition of Vitruvius, after having been circulated for 30 years in manuscript: that is, some 71 years after Poggio's 'rediscovery' of the manuscript of Vitruvius in the library of St Gall.
49. Vitruvius, *ibid*, 1.1.1: 'Fabrica est continuata ac trita usus meditatio, quae manibus perficitur e materia cuiuscumque generis opus est ad propositum deformationis.' Granger notes: 'The word hand (*manibus*) scarcely occurs in the index to Plato, and is glorified by Aristotle who defines it as *organon organon*, 'the tool which makes tools'. Granger *ibid* p.7; Lewis and Short, *ibid*, p. 712: 'fabrica . . . the workshop of an artisan who works in hard materials . . . II. Transf., the art, trade, or profession of such an artisan . . . In apposition with *ars* . . .' For notes regarding *ratiocinatio*, refer *infra*.
50. Frances Yates, *Theatre of the World* (London: Routledge and Kegan Paul, 1969), p. 193.
51. *Oxford English Dictionary* (Oxford: Clarendon Press, 1933), p. 530.
52. John Wilkins *Of the principles and duties of natural religion*. (London: T. Basset, H. Brome, etc, 1675), p. 56.
53. W. Ong, *Ramus. Method and the Decay of Dialogue*, from the art of discourse to the art of reason (Cambridge, MA: Harvard University Press, 1958).

'Primitive wisdom' and modern architecture

Felicity Scott

From November 1944 to March 1945 a curious exhibition entitled *Are Clothes Modern?* was on show at the Museum of Modern Art in New York, directed and designed by Viennese émigré architect and author, Bernard Rudofsky. The exhibition, and subsequent book, produced a critique of the codification of modern architecture in the US through the somewhat unlikely vehicle of a study of apparel. Following the rejection of his proposal to exhibit 'primitive' architecture at MoMA, Rudofsky came to realise that such concerns did not characterise modern architecture in the US, thereby excluding his own modernist formation. Through a series of visually compelling, if pseudomorphic, juxtapositions between ethnographic artefacts and visually similar artefacts from industrial culture, *Are Clothes Modern?* set out to expose the illegitimacy of the opposition between practices considered to be 'primitive' and those considered to be modern. Moreover, invoking lessons afforded by the tools and disciplinary concerns of anthropology and ethnography, Rudofsky proposed the 'readjustment' of International Style architecture through the incorporation of alternative domestic habits. The historical and cultural determination of apparel, along with that of practices of decorating and deforming the human body, opened the way for such a readjustment, by insisting that such habits were not so much organically necessary as culturally functional. Apparel and the appearance of the body were to provide both allegorical lessons regarding architecture – exposing both as cultural formations and thereby available for reworking – and instances of more functional relations.

'Primitive wisdom' and modern architecture

In 1940, the Museum of Modern Art in New York organised a competition entitled *Organic Design in Home Furnishings*, the stated aim of which was 'to select a group of designers capable of creating a useful and beautiful environment for today's living.'¹ In addition to the main competition for designers from the United States (widely remembered for the prizewinning schemes of Charles Eames and Eero Saarinen), a second, independent competition was held for residents

of Mexico, Central and South America, and the West Indies. Of the five prizes awarded in the latter category, one went to Brazilian designer Bernardo Rudofsky, for his designs of outdoor furniture. The museum found them notable for the manner in which they incorporated indigenous Brazilian fibres such as jute, carowça, and cânhamo upon wood and metal frames.²

To demonstrate the museum's growing pan-American commitment, the Latin American winners were to be flown to New York to receive their

awards and to be supported for a short design tour of the US, after which they were to return to their country of origin. Rudofsky's case, however, was not so easily assimilated into the museum's competition rules. 'Bernardo' was actually Bernhard Rudofsky, born in 1905 in Zauchtl, Moravia. Brazil was neither his homeland nor even his adopted home, but merely one stop in a life-long itinerary that had already taken him from Moravia to residences in Austria, Germany, Greece, Italy, Switzerland, and Argentina. Despite the disruptive effects of the rise of fascism in Europe and his own 'peripatetic' way of life, by 1941 Rudofsky had established himself as an accomplished modern architect and author.³ He had practised architecture in Vienna, Berlin, Capri, Naples, Milan and São Paulo, and his projects and writings had been published in, among others, *Domus*, *Casabella*, *Architettura*, *Baugilde*, and *Architectural Review*. Raised and educated in Vienna, Rudofsky held an Austrian passport in 1938, the year of Hitler's annexation of Austria. Not wanting to become German, he was without citizenship in 1940 and unable to travel freely between the US and Brazil. Although in opposition to the museum's intentions for the *Organic Design* competition, Rudofsky took the invitation to visit as an opportunity to migrate once again. With the Austrian quota full, he relied on his Moravian birth to apply for citizenship in the US as a Czechoslovakian. Dropping in the process, both the 'o' and 'h' from his name, he became the somewhat more anglicised Bernard Rudofsky.⁴

Following his arrival in New York in 1941, Rudofsky was invited by Philip Goodwin, at that time Chairman of MoMA's Department of Architec-

ture, to propose an exhibition on modern architecture. What Rudofsky submitted was a portfolio of photographs of vernacular architecture from the Mediterranean region that had been taken in the 1920s and 1930s during a series of excursions to, in his words, ' "exotic" – in the sense of "alien" – places.'⁵ As he recalled years later, he thought "Vernacular architecture . . . would be a welcome departure from routine."⁶

In this, however, Rudofsky was sadly mistaken. His photographs were rejected as 'unsuitable for a museum dedicated to modern art'. 'If anything,' he recalled, his proposal 'was thought to be anti-modern'.⁷ This came to Rudofsky as quite a surprise, since he had already shown these photographs within the context of an exhibition of modern architecture and design – the 1931 *Berliner Bauausstellung* – the Austrian section of which he was responsible for organising. As we shall see, for the Viennese-trained Rudofsky residing in Weimar Germany in 1929 and in Italy throughout the 1930s (during a period of rising philhellenism and interest in spontaneous architecture) such 'primitive' architecture was firmly situated within the modernist discourse.

If Goodwin turned the exhibition down, this was, as Rudofsky noted, 'because the Museum was just then preaching the gospel of modern architecture.'⁸ That gospel was, of course, the International Style. Codified nearly a decade earlier by Alfred Barr, Henry-Russell Hitchcock and Philip Johnson through the 1932 show *Modern Architecture: International Exhibition*, the International Style had established itself by this time as the prevailing discourse of architectural modernism in the US. This style had

forged from a variety of modern architectural practices a unified aesthetic and adopted the rhetoric of a transparency of function and truth to materials.⁹ Not to be defeated, Rudofsky promptly repackaged his ideas into an equally unlikely exhibition proposal, initially called the *Problems of Clothing*. In 1943, perhaps surprisingly, the Museum accepted Rudofsky's plans for this exhibition, which was subsequently re-titled *Are Clothes Modern?* Opening in November 1944, the exhibition was on show at MoMA until the following March, after which it traveled to ten further locations under the auspices of the museum's circulating exhibition programme. In 1947, Rudofsky published the project as a book, *Are Clothes Modern? An Essay on Contemporary Apparel*.¹⁰ Although vernacular architecture was considered an anathema to the concerns of MoMA, clothing, it seems, was regarded as an acceptable medium for Rudofsky to voice his critique of the 'concepts' of modern design.

The Museum's press release largely elided the polemical intent of *Are Clothes Modern?* in regard to modern architecture. It was, however, revived in the accompanying biographical portrait written by Rudofsky's close friend and fellow Viennese-trained architect Felix Augenfeld.¹¹ Bernard Rudofsky, it began, 'is of the disapproving kind. His disapproval of the institutions of this world reaches a very unusual degree.'¹² Augenfeld went on to explain one consequence of this disapproving character: Rudofsky's critical attitude to the institution of architecture. Rudofsky, as Augenfeld put it, 'consider[ed] human dwellings the crowning failure of mankind and has therefore made architecture his main profession.'

This critical attitude, Augenfeld implied, although focused on architecture, had led Rudofsky to engage in activities considered to be beyond the traditional bounds of that occupation. By the age of 39, Augenfeld noted, tracing this disciplinary mobility, Rudofsky had been

'successfully active in a number of varied fields. He is, or has been, an architect, engineer, industrial designer, stage designer, editor, musician, actor, fashion designer, shoemaker, archaeologist, photographer and typographer.'

Within this range of practices, modern architecture held the position of the most momentous 'failure' of modern culture, incurring this infelicitous privilege, according to Rudofsky, by bringing together a number of modern habits and conceits. It had thereby become 'the most integrated expression of our way of living', a way of living that Rudofsky considered fundamentally flawed.

The fields that Rudofsky deployed to create his expanded formulation of architecture appear to mirror the disciplinary terrain of the Bauhaus. Also apparent, however, is a strange inversion. Against the elevated status of architecture within the Bauhaus, its positioning as the teleological end point of a new synthesis of the arts,¹³ architecture, for Rudofsky, had the tendency simply to formalise extant habits and ideologies. Moreover, unlike Walter Gropius' organic notion of a 'welding', Rudofsky maintained a distinctly dissimilar conception of the relations that would ideally be accorded between those various arts, and the manner in which they related to architecture.¹⁴ If

the integration of 'ways of living' might be constructed along the lines of the strands of an assemblage, those very same fields of habituation studied by Rudofsky could be recast as sites of multiple transformations of architecture. In this formulation, architecture, understood as their site of interweaving, might also serve as a privileged sphere for potential uncoupling – and, in turn, reformulation – of the habits of modern life.

Rudofsky understood his other vocations as elements of a complex network of practices that granted insights into a subject's behaviour. This research was in turn intended to refunction architecture. 'In order to create good architecture,' Rudofsky believed, 'ways of living must be critically investigated.' In Augenfeld's characterisation:

'A revised scale of values has to be applied to the functions of our daily life, such as eating, drinking, sleeping, dressing, music making, recreation and social life. Architecture in the broader sense in which he conceives it has to be approached by readjusting the elements on which it is based.'¹⁵

In order to achieve this, Rudofsky was to take up another profession, that of the amateur ethnographer or anthropologist, studying the everyday life of the modern individual with a view to understanding the formation of their customs and habits. In the pursuit of his ethnological interests, Rudofsky, in *Are Clothes Modern?*, constantly compared modern domestic habits with similar aspects of cultures considered 'primitive'. The readjustments to architecture to which Augenfeld alluded, were to be made through the functional lessons

provided by those studies, leading ultimately to the incorporation of alternative ways of living into the modern domestic space. Rudofsky's project would produce a portrait of a reconstructed modern architecture, one replete with aesthetics and practices that could almost certainly be regarded as perverse in relation to the International Style.

Despite Augenfeld's polemicising on Rudofsky's behalf, the exhibition and later book failed to capture the attention of either the architecture or design communities.¹⁶ This is far from surprising, since only a brief final section of the display was expressly directed towards questions of domestic design. Instead, the exhibition predominantly comprised representations of the human body, displayed along with techniques and artefacts used to fashion and refashion a subject's corporeal appearance. Taken together, the diagrams, photographs, articles of clothing, ornaments and models exhibited in the galleries produced a bizarre panorama of bodily reshaping or, as one reviewer commented, an image of a 'sartorial chamber of horrors'.¹⁷

A visitor approaching the exhibition was initially faced with a small entry vestibule, on one wall of which hung a line of woodcuts depicting monsters reproduced from the *Liber Chronicarum* of 1493 (Fig. 1). Rudofsky used these to illustrate a fifteenth-century vision of 'many races or nations'. Suspended from the ceiling were a series of prehistoric glyphs or pictographs taken from cave paintings found in Spain and published in Abbé Breuil's *Anthropologie*, which depicted further variations in conceptions of the human

figure. The title of the exhibition, on a panel posing the question 'Are Clothes Modern?', hung from the centre of the ceiling. The phrasing of the title's question, unlike for instance, the 1941 exhibition *What is Modern Architecture?*, invoked a spectre of doubt about contemporary clothing that would taunt the viewers as they proceeded through the installations. If they were not already cautioned as to the show's peculiar contents, visitors were further alerted with an introductory text panel, reading 'Warning! This is NOT a fashion or dress-reform show.' The succeeding text went on to summarise the exhibition's intentions: 'It aims to show how and why we dress as we do, and how greatly clothing influences our behavior. It examines clothing the way the chemist analyzes food and as the architect studies shelter.' If the exhibition was not simply a show of dress reform, it intended, nevertheless, to illustrate the 'maze of irrational and accidental clothing habits' within which the modern subject was trapped and from which, as the wall panel went on to conclude, it was 'time to escape'.¹⁸

Following the entry corridor were the nine main thematic sections of the exhibition, within which artefacts were grouped not according to their historical or cultural specificity but, rather, to stage a comparison of the 'primitive' and the 'modern'. Photographs of Chinese foot binding, for example, were juxtaposed with contemporary advertisements for pointed, high-heeled shoes.¹⁹ Images of the bound waists of Papuan islanders were juxtaposed with an array of modern Western corsets dating from the early nineteenth century to the time of the exhibition. And photographs of

the neckrings worn by Burmese women were compared to 'theater blouses' from 1898 (Fig. 2). As one reviewer described this comparative technique, 'Mr Rudofsky [sic] does more than put curiosities of couture on display.' Rather, he continued, Rudofsky 'sets the modern glamour girls, with bleached hair, sun-tan, green eye-shadow, purple-red lips, leg make-up, painted finger-and-toenails, beside pictures of tattooed 'savages' – and one gets the point.'²⁰

These juxtapositions, largely and avowedly pseudomorphic, were intended to wrench subjects from their complacency by revealing certain affinities between the so-called 'primitive' and the so-called 'modern'. Through this, Rudofsky hoped to show that modern culture was not as rational, nor as far removed from 'primitive' habits, as was supposed. Indeed the comparisons were to have an estranging effect, rendering familiar modern artefacts, in Rudofsky's words, 'ethnological'.²¹

The majority of the exhibition consisted of such formal juxtapositions, supplemented, at various points, with witty installations designed to illustrate the decorative or non-functional aspects of modern clothing. Perhaps the most memorable of these was Rudofsky's life-size, transparent diagram of the 70 buttons and 24 pockets adorning modern Western man's business attire (Fig. 3). This was described as a 'simulated x-ray examination of the layers upon layers of useless buttons and pockets modern man considers necessary to preserve dignity'.²² Visible on the wall through the glass planes of this display was a typical summary statement: 'What glass beads are to the savage, buttons and pockets are to the civilized.'

Throughout sections entitled 'The unfashionable human body', 'Posture, causes and effects', and 'The desire to conform', Rudofsky displayed the way in which normative conceptions of the body, such as those determining correct states of posture, modesty, and comfort, were culturally and historically determined. For instance, against any notion of a purportedly absolute and indivisible virtue of modesty, he asserted:

'Inquiry reveals that modesty shows a multitude of forms which depend on such divergent factors as age, habit, custom, law, epoch, climate, time of day and others. Each factor imparts additional significance which challenges a different interpretation; many are contradictory or variable. Furthermore, modesty and immodesty are not always clearly recognizable. Their borders are blurred, and confusion besets premises and conclusions alike.'²³

For Rudofsky, precisely on account of this uncertainty, cross-cultural study could illustrate the insupportability of existing hierarchical categorisations, implying a breakdown of extant oppositional structures such as primitive and modern. Here, his introduction of anthropology found its primary vocation; it was to provide a key for understanding the constructedness and historicity of cultural norms. Moreover, the 'contradictory or variable' interpretations arising from such research formed a key part of Rudofsky's epistemological strategy, continually insisting on the blurring of borders such as that demarcating what was properly architectural.

Within this polemical display of the multitude of forms that bodily practices might assume, the criti-

cal status that Rudofsky afforded the artefacts and comparisons within his exhibition was not uniform. As a whole, his visual and textual commentaries formed part of a complex, disturbing, and at times paradoxical, articulation of the terms of this differentiation. And although patterns did emerge, Rudofsky's attitude towards what were considered to be primitive bodily habits seems to have been as ambiguous as it was contradictory. Certain practices, such as Chinese foot binding, were shown to transgress the organic functioning of the human body in favour of 'psychological' benefits. When compared with such accepted Western practices as wearing heels, the latter were exposed as not merely un-functional but, in fact, harmful. Other exhibits, such as Native American moccasins (borrowed from the Museum of Natural History) were not presented as similarly irrational. Rather, these were used to present a pre-history of such nominally modernist tropes as truth-to-materials and transparency of function. In addition, they disclosed another desirable functionality, providing instances of close and sensual relations between bodies and domestic environments, relations that Rudofsky regarded as lacking in modern functionalist architecture but wished to retrieve.

Through illustrating the rationality of supposedly 'primitive' solutions, Rudofsky posed a challenge to the conceits of superiority underlying the prevailing notion of modernist functionalism. That is, Rudofsky posed a critique of that hierarchy of cultures from the perspective of 'primitive wisdom'. Framed to encourage a cultural substitution through an appeal to a more discriminating rationality, these were the practices to be deployed to

reconstruct modern habits – at least speculatively. As Rudofsky's wall text argued, 'A change in dress from irrational to rational will bring about a parallel change in our surroundings and will permit better ways of living.'

Rudofsky's claim to rationality was articulated through a paradoxical conception. At times, the alternative rationality that Rudofsky found in 'primitive wisdom' entailed a notion of biologically or anatomically correct relations between a subject and their clothing or mode of habitation. Situated as the key to producing an affective relation between the subject and their surroundings, the ensuing sensuality of this bond – one that Rudofsky figured as more 'natural' – would ensure psychosexual health. Yet at other times Rudofsky pointed to a cross-cultural and trans-historical supplementarity in which the human body was regarded as incomplete without decoration.²⁴ It was precisely humanity's imperative to configure the body as a cultural product that he hoped to show was, in being universal, also natural. In modern societies, Rudofsky argued, this imperative to decoration had been tied to the imperative of economic profit, and manifested itself in fashion. In the exhibition, Rudofsky illustrated the effects of this unending cycle of production and consumption through a comparative line of 'body idols': apparently monstrously deformed mannequins described in the press release as 'four small plaster figures which show a woman's body as it would have appeared had it fitted the clothes of four fashion periods'²⁵ (Fig. 4). As explained by these 'body idols', the modern body was subjected to no fewer contortions than those initially figured in the entry

vestibule as 'primitive' and monstrous. This brings us to the other side of Rudofsky's conception of rationality. How then could the visitor determine what constituted a rational supplement to a subject's originary corporeality? How could one recognise correct relations between this ever-changing body and its domestic surrounds?

For Rudofsky the answer was simple, since he understood the relation between clothing and architecture – and similarly the relation between other domestic habits and architecture – as direct and virtually unmediated.²⁶ Architecture was regarded as a particularly tangible result of the acculturated body's means of inhabitation – a translation of one's habits and posture into stone. At the same time, these architectural casings were also the tools of the habituation of these bodies. Thus a subject's mode of occupation would determine their architectural casing, and that architecture would in turn constitute their mode of inhabitation.

By providing the medium of a functional relation with the body, architecture was like clothing in that it effected and was affected by the body's posture, habits and customs, those aspects of daily life that Rudofsky set out to reformulate. In *Are Clothes Modern?* Rudofsky explained that 'Quite apart from its psychological effect, which the wearer experiences directly, dress still dictates our behavior.' He then continued, linking this directly to formations of the body:

'Most of the discomforts of our homes and furnishings, of our routine of working, relaxing, sleeping, eating, bathing, playing, traveling, etc., can be

traced back to our unfortunate . . . ideas of building up our bodies.²⁷

In dictating our behaviour, the body–clothing coupling left its traces in an architecture that, unless critically addressed, would unequivocally mirror the dominant ideology. As Rudofsky would later somewhat ominously put it: 'Bricklayer [Winston] Churchill sized up architecture as a mold for the human mind when he said, "We shape our buildings, and afterwards our buildings shape us."'²⁸

The final section of the exhibition – the section subsequently elided from the book – made the connection of clothing with the architectural environment explicit and clear. Entitled the 'Domestic background of clothing', this section offered viewers an example of an imaginary architecture that remained outside the familiar forms of modern domestic design. Unmistakably strange, it consisted of two installations:

'specially built models which indicate some of the ways in which clothing and footwear designed on entirely new and rational principles might influence the floors and furniture of a house and eventually the architecture of the house itself.'²⁹

Separated from the viewers by a series of vertical bars and a roped-off entry way, the first of these installations contained two near life-sized photographs of bare-footed women in simple robes (Fig. 5). The true substance of the exhibit, however, was situated beneath them: a marbelised foam-plastic recreation of a smooth but dramatically uneven floor surface. With hyperbole typical of

Rudofsky, this was meant to illustrate an 'extreme example' of the organic relation between a body and its domestic environment, the wavy floor here being posited as a correlate of bare-footed home life. A wall text provided the viewers with four points outlining the supposed advantages of this floor:

1. It excludes conventional furniture and hard-soled footwear.
2. It conserves the tactile sensibility of our feet, which flat surfaces and modern shoes have destroyed. (In nature, the only perfectly flat hard surface is frozen water.)
3. It might be more agreeable to sit on than a flat floor.
4. It offers new possibilities to the sculptor who could make of it a work of art to be touched as well as seen.

While this dramatic image was no doubt implausible, Rudofsky also had a serious intent. Polemically posing this as an alternative relation to the surfaces of modern domestic architecture, the exhibit implicitly argued that the body was supposed to relate to these coverings in a most intimate manner. Considered shocking at the time, this uneven floor installation provoked a lot of critical attention. As James Thrasher wrote for the *Cincinnati Post*, 'We've lost the tactile sensibility of our feet, says the designer, who apparently thinks the unshod modern foot wouldn't know a tack when it stepped on one.'³⁰ This intimacy offering an antidote to the alienation of modern societies, would, Rudofsky hoped, transgress a more

familiar teleology of civilisation from tactility to abstract visual relations.³¹

The other installation in this section was somewhat less dramatic, and staged through an identifiable historical precedent. It was a small room entirely covered with marbelised wallpaper, in which was situated a low table surrounded on two sides by an equally low corner bench (Fig. 6). It was meant to recall a Hellenistic dining arrangement in which people ate in a reclining position. Noting that the show examined 'among other customs, certain architectural conventions, and [found] them wanting', a reviewer for *Interiors* wrote:

Mr. Rudofsky, himself an expert furniture designer, as proved by his capturing a prize in the *Organic Design* show, is a professed chair hater. He prefers shelves which jut out from walls. He would also rather lie down than sit up when he eats.³²

Rudofsky was not, however, necessarily prescribing a return to such a reclining position for dining but, rather, recuperating a model of an *equally* functional architectural environment that was distinctly outside what was now considered to be befitting. His architectural polemic was continued through the relation of that environment to an individual's dress. Hung on the walls were images of a woman in a 'loose-fitting dinner robe', a mode of dress reminiscent of the toga.³³ Although 'Today ... the reclining position is considered improper,' as Rudofsky's wall text made clear, 'Wearing loose-fitting dinner robes, removing footwear at table (before eating) and reclining com-

fortably on specially built couches and cushions, were once universal customs.'³⁴ Rudofsky's installation was to provide a model relation between a subject's functional dress and their domestic architectural setting, one whose sensual associations had rendered it unsuitable for contemporary life on moral grounds.

Ethnographic artefacts had appeared within the Museum of Modern Art before Rudofsky's arrival, in, for instance, *American Sources of Modern Art (Aztec, Mayan, Incan)* (1933), *African Negro Art* (1935), *Prehistoric Rock Pictures* (1937) and *Indian Art of the US* (1941), exhibitions organised by the Department of Painting and Sculpture. And it was in fact such an extant modernist discourse that Rudofsky saw as a precedent for many of the issues raised by his project. As Rudofsky pointed out, 'The refined individual has developed an appetite for the culture of the primitive man,' Reciting a litany of primitivist tropes, he continued:

'Modern art is unthinkable without the example of African and Oceanic sculpture, the knowledge of unconscious and subconscious forces, the imagery of the infantile, deranged and insane. The preoccupation with such diverse subjects, which formerly were considered alien to art and artists, brought about a total reorientation of our esthetic concepts.'³⁵

It was a corresponding reorientation that Rudofsky hoped to effect within the Museum's discourse of modern architecture and design. Both through exposing 'so-called primitive' traits to be constitutive aspects of modern aesthetics, and through the

introduction of practices from other cultures into modern domesticity, Rudofsky's project disrupted what he saw as the conventional boundaries of modern architectural discourse in the US. By rendering such divisions insupportable, he hoped to make visible an alternative modernist trajectory.

Rudofsky's engagement with the discourses of ethnography and anthropology did not arise in the context of his critique of American modernism. Rather, these interests reach as far back as his student days at the Technische Hochschule in Vienna, where, as a student from 1923 to 1931, he studied architectural vernaculars. During this period, Rudofsky made numerous excursions, including an extended stay on the island of Thera in the summer of 1929, a trip that provided material for his doctoral dissertation, *Eine Primitive Betonbauweise auf den Südlichen Kykladen, nebst dem Versuch einer Datierung derselben*.³⁶ The polemical tone of his work *Are Clothes Modern?* was, however, in many respects particular to the American context. For despite the influence in the US of European aesthetic practices and critical discourse, there remained a significant epistemological divide between the discourses and institutions of modern architecture in the US and those in Europe. Rudofsky's anthropological interests, it soon became apparent, lay on the continental side of this divide.³⁷ The disciplinary techniques and concerns of anthropology that Rudofsky here deployed as a means of investigating material culture, power and alterity, thus also provided him with a tool for polemically disrupting the reigning codification of architectural modernism in the US.

At times, Rudofsky himself fell prey to his own polemic to invert hierarchical terms. Rather than tactically opposing so-called 'primitive' wisdom against the purported rationality of modern society – in order to disrupt the privileging of the latter – Rudofsky often seemed to promote such practices uncritically as superior forms of reasoning. Once the historical and cultural determination of bodily and domestic customs were exposed, however, one could no longer fall back on the assumption of a 'natural' or anatomical form. (His examples of the prosthetic nature of clothing and decoration did, however, acknowledge this.) Nor could one assume that identifying the constructedness of cultural representations would result in impartiality, for the social norms through which they were founded, as he also at times indicated, had deterministic logics. While Rudofsky's critique acknowledged that the cultural and historical dimensions of a subject's appearance lapsed into second nature, his polemic nevertheless positioned certain practices as closer to a natural sensuousness and, thus, more 'rational' and less ideological.

In fact, Rudofsky did believe in a critical and liberative aspect to intimate relations between the body and architecture. According to him, this would somehow counteract the disturbing effect of the prevalent abstraction through which this relation had been articulated by the space-calibrating practices operative in certain schools of modern architecture. We might still wonder how, in situating the attraction of intimacy as a means of escape from such abstraction, Rudofsky could suspend it in a critical relation to what he saw as the alienated

situation of the modern subject without reverting to the problematic assumption of a purely organic or biological relation.

Fashioned as a provocation, *Are Clothes Modern?* approached its examples with little sense of historical or cultural detail. For instance, Rudofsky's invocation of the toga and its relation to Hellenistic dining was not intended as a scholarly study, and his lack of historicisation resulted in a telling response from two critics who added postscripts to his account. *Interiors* referred to his installation as 'reminiscent of classic and archaic interiors and a world when slaves were rampant'. *Time Magazine* went further, suggesting that such philhellenism had been recently adopted by less than democratic parties: 'Reich Marshall Herman Goring' they noted, 'had taken to wearing a toga at tea.'³⁸ While Rudofsky's approach to the toga as a paradigmatic instance of an alternative functionality, set out to reveal contemporary cultural hierarchies as illegitimate, his lack of historical specificity raises important doubts as to the political implications of such a technique. Despite Rudofsky's attempt to use this example critically, to deploy such an example strategically against hegemonic structures would also entail a critique of its historical and sociopolitical context. Intending to collapse oppositions, most of Rudofsky's examples did not take into account the historical relations that inscribe and maintain structures of inequality: for instance, the hierarchy of a privileged Western 'centre' and other cultures deemed to be 'primitive'.³⁹ To understand Rudofsky's work

we need, however, to address a role that history nevertheless played in his project.

Rudofsky understood that, by 1943, modern subjects had become highly disconnected from traditional environments. One aspect of his response to this contemporary condition was to retrieve certain traditional practices, ones not necessarily arising with a subject's own culture, in order to resist the vicissitudes of modern industrial life. 'In static countries,' he argued 'where an age-old culture constitutes an element of inertia, tradition is strong enough to defeat the hysterical fits of fashion.'⁴⁰ This capacity to create functional artefacts was not simply nostalgic nor limited to 'primitive' cultures. The contemporary design of Sweden or Switzerland, provided Rudofsky with another example of a culture 'relatively impervious to fashion promotion'. Invoking MoMA's rhetoric of Useful Objects, he went on to posit the benefits of a universal 'standardization of quality' that might foreclose the ceaseless harnessing of a subject's desire by the fashion industry.⁴¹ 'Many tools, like scissors, plane[s], skis, and snowshoes do not show a marked difference throughout the centuries,' he insisted:

They are essentially the same in all continents and have preserved their pure form. It is not too much to ask that a few useful objects of good form should be saved from the chaos of taste and made permanently available.⁴²

Rudofsky acknowledged the potential dictatorial nature of this desire to obtain a fixed functional

or useful object. He did not believe, however, that it would be subject to a homogenising regime such as that produced by the 'sinister system of control' operating in the fashion industry.⁴³ Perhaps along with the other paradoxes within his project, there remains the possibility of addressing the critical epistemological challenge of the cultural disconnectedness, both tacitly and overtly addressed, in *Are Clothes Modern?* For when considered in relation to Rudofsky's account of universalisation, another mode of circulation emerges, one distinct from that afforded by the internationalism of the Museum's conception of modern design. Rudofsky's project, albeit championing certain traditional practices, did reside – at least conceptually – within the historical space of that period. Affirmation of this was furnished by his emphatic rejection of the 'wish for a reversion to earlier stages of development in clothing'. In fact, Rudofsky argued that 'Traditional or fixed dress in its wider sense exists under circumstances which are almost absent in our civilization.'⁴⁴

Insofar as the term 'primitive' registered that which was not the high culture of the 'West', it relied on spatial and temporal distinctions that were clear. The migrant populations inhabiting Western cities, however, and the tourists traversing the globe, rewrote these relations, calling into question both the historical viability of oppositional distinctions and their political implications.⁴⁵ Moreover, that modern subjects had become 'un-fixed' from organic relations to a homeland was a condition Rudofsky understood well from his own peripatetic existence.

Referring to the destabilising effects of increased mobility, Rudofsky scoffed at 'the leveling influence

of modern communication'.⁴⁶ No longer discrete or contained, different societies had been incorporated into a global network. 'The shriveling of earthly distances', he argued, 'through the perfection of means of transportation, brings within easy reach localities which formerly were safely isolated.'⁴⁷ Lamenting the effects of such *rapprochement*, he noted that, in some instances, this led to the imposition of Western moral codes and hence the obliteration of other, more 'rational', attitudes to the body.⁴⁸ Yet this interaction should not necessarily translate into a homogenisation of cultures or levelling of difference. For the possibility of such an unmitigated consequence assumes a strictly universal subject that Rudofsky's self-professed resistance to assimilation would implicitly refute. Likewise, one must be cautious in assuming the benevolence of any standardisation or equivalence, a benevolence Rudofsky certainly did not recognise in the International Style.

We might recall that for Rudofsky the interaction between cultures was not characterised by a one-way traffic – the imperial march of Western modernisation. In fact, he hoped that other forms of mixing had allowed, and would continue to allow for the incorporation of domestic practices and techniques from other cultures into the framework of modern architecture. This would take place through a programme of 'readjusting the elements on which [architecture] is based'. Rudofsky exhibited such an operation in the hybridity of materials and techniques of his 1941 *Organic Design* competition entry for outdoor furniture. Eventually, Rudofsky hoped, the introduction of alternative domestic practices – other modes of eating,

sleeping, dressing and sitting – would produce an architecture re-written both from within the terms of the discipline and from terms considered to be outside these boundaries.

What then was the status of these fragmented domestic practices, those extracted from other cultures? In his expanded field of inhabitation, were these other formulations to be employed as different possibilities or were they simply appropriated to provide new norms? It appears that in some ways they were both. While Rudofsky rejected the reduction of cultural habits to ‘picturesque anachronisms’ – and their recuperation for commercial tourism – as a form of violence, he believed that one might nevertheless reconfigure traditional and standardised objects within another construction.⁴⁹ The production of a bricolage, through the multiple displacement or appropriation of alternative domestic practices, provided the mechanism of his disruption, and subsequent reformulation of the official codification of modern architecture. In addressing the sociohistorical constructedness of cultural habits, Rudofsky’s project freed them from a strictly organic conception. Moreover, these functional norms might themselves be ceaselessly exchanged, albeit according to unnamed dictates other than those of commodification and fashion. Thus freed also to drift into other contexts, such domestic practices were perhaps also rendered available for multiple appropriations for, by extension, a multitude of differentiated subjects.

Notes and References

1. ‘Competition announcements and prizes’, *Pencil Points*, (October 1940), p. 24.
2. Eliot F. Noyes, *Organic Design in Home Furnishings* (New York, Museum of Modern Art, 1941), p. 44. This hybridising of modern techniques – such as metal-framed chairs – with indigenous ones, as well as the embrace of lifestyles characteristic of temperate climates, is emblematic of much of Rudofsky’s design work.
3. The biographical note on the dust jacket of Rudofsky’s *Streets for People: A Primer for Americans*, (New York, Doubleday and Company, 1969) described him as ‘a confirmed peripatetic’.
4. Rudofsky left Austria indefinitely in March 1932 and moved to Italy. Residing initially on the small island of Capri, he then moved back and forth between Procida and Naples. In collaboration with Luigi Cosenza, he designed the Casa Oro in Naples during this period. After meeting Gio Ponti in the summer of 1937 Rudofsky moved to Milan, where he worked in association with Ponti on, among other things, a project for a new type of hotel in Venice. He had begun to work in an editorial position at *Domus* when his stay was cut short through the rise of fascism. During the period Rudofsky spent in Italy from 1932 to 1938, he first articulated an analysis of the human body directed towards a reformed modern architecture, the subject that this article will address. Following the *Anschluss*, Rudofsky fled to Switzerland and then on to South America. He resided briefly in

Buenos Aires, then Rio de Janeiro, after which he moved to São Paulo, Brazil. There he worked as both a furniture designer and architect. Some of his most important buildings are to be found in São Paulo, including the Kocher watch shop and two modern villas – the Arnstein and Frontini houses.

I would like to thank Mrs Berta Rudofsky for many long conversations on the life and work of her late husband that have significantly expanded and clarified biographical information.

5. Bernard Rudofsky, *Architecture without Architects* (New York, Museum of Modern Art, 1965), n.p.
6. Bernard Rudofsky, *The Prodigious Builders: Notes Towards a Natural History of Architecture* (New York, Harcourt Brace Jovanovich, 1977), 'Afterword', pp. 366–367.
7. *Ibid.*
8. Bernard Rudofsky, lecture given at the Northwestern region's annual AIA conference entitled 'Total Architecture', Seattle, 1966.
9. The history of the International Style within American architecture is, of course, complex. It is reductively characterised here through the tropes Rudofsky addresses in his polemic. On the exhibition and reception of the International Style see: Philip Johnson, Henry Russell Hitchcock and Lewis Mumford, *Modern Architecture – International Exhibition* (New York, Museum of Modern Art and W.W. Norton and Co., 1932); Philip Johnson and Henry Russell Hitchcock, *The International Style: Architecture Since 1922* (New York, W.W. Norton, 1932); and Terence Riley, *The International Style: Exhibition 15 and the Museum of Modern Art, Columbia Books of Architecture* (New York, Rizzoli/CBA, 1992).
10. Bernard Rudofsky, *Are Clothes Modern? An Essay on Contemporary Apparel* (Chicago, Paul Theobald, 1947). In 1971 Rudofsky returned to this project and published a revised version entitled *The Unfashionable Human Body* (New York, Doubleday and Company, Inc., 1971).
11. Augenfeld had, like Rudofsky, trained to be an architect at the Technische Hochschule in Vienna, although with the generation of Richard Neutra and Ernst Freud, a number of years prior to Rudofsky. Augenfeld had enrolled in Loos' Bauschule prior to World War 1, and emigrated in 1938 to New York to flee anti-Semitism.
12. Outlining Rudofsky's thinking in succinct terms, the sketch was subsequently printed in a number of daily papers. For instance, 'Art News and Notes', *Dispatch Herald* (Erie, PA, 17 December 1944).
13. The 'First Proclamation of the Weimar Bauhaus' began: 'The complete building is the final aim of the visual arts.' Reprinted in Herbert Bayer, Ise Gropius and Walter Gropius, *Bauhaus 1919–1928*, 1952 edn (New York, Museum of Modern Art, 1938), p. 16. Walter Gropius' essay in this volume, entitled 'The theory and organization of the Bauhaus', continued this argument, citing the Bauhaus credo that 'The Bauhaus strives to coordinate all creative effort, to achieve, in a new architecture, the unification of all training in art and design. The ultimate, if distant, goal of the Bauhaus is the collective

work of art – the building – in which no barriers exist between the structural and decorate arts' [italics in original]. Op. cit. pp. 22–23.

14. *Ibid.* p. 23.
15. Press release for *Are Clothes Modern?*, Museum of Modern Art, New York.
16. From its initial appearance at MoMA, through to the reception of the book, *Are Clothes Modern?* elicited enormous coverage from a slightly bewildered, but titillated, popular press. The only coverage from the design press was a brief mention in *Interiors*.
17. James Thrasher, 'Sartorial chamber of horrors offers plea for dress reform', *The Pittsburgh Press*, (Pittsburgh, PA, Saturday 16 December 1944), Second Section, p. 9.
18. Department of Registration Exhibition files, MoMA Exhibition #269.
19. The caption to this installation read: 'These illustrations of a Chinese Lily foot and a contemporary shoe show great similarity in appearance and in esthetic ideas. The illustration on the left shows a foot bound to a stiff sole with a high heel and results in a small-looking foot and a stilted, goatlike walk, similar to the Chinese foot and walk. (The purpose of both Eastern and Western deformations is to enchant the male.)' Department of Registration Exhibition files, MoMA Exhibition ' 269.
20. Review, J. Thrasher, 'Are clothes really modern, or why don't we park shoes outside?' *The Washington Daily News*, (Washington, DC, 1944), B4.
21. The resemblance of Rudofsky's strategy to that of the 1984 MoMA Exhibition, '*Primitivism*' in *Twentieth Century Art: Affinity of the Tribal and the Modern*, installed at the museum 40 years later, is marked. For critical reception of this later show and the primitivism operating within the museum, see: Hal Foster, 'The "primitive" unconscious of modern art, or white skin black masks', in *Recordings: Art, Spectacle, Politics* (Seattle, WA, Bay Press, 1985); and James Clifford, 'Histories of the tribal and the modern', in *The Predicament of Culture* (Cambridge, MA, Harvard University Press, 1988). From this point on in the text, all references to 'primitive' should be understood as within square quotes.
22. Earlier draft of press release, 'Museum of Modern Art to Open Exhibition *Are Clothes Modern?*', Department of Registration Exhibition files, MoMA Exhibition #269.
23. Rudofsky, *Are Clothes Modern?* (1947), p. 19.
24. Describing this supplemental relation Rudofsky wrote: 'For various reasons, historical and emotional, our body proper is believed to be incomplete – a body minus clothes.' *Are Clothes Modern?* (1947), p. 19.
25. These 'body idols' were designed by Rudofsky and modelled by the Italian artist Constantino Nivola. The four modern periods portrayed included: 'the dowager type with the shelf-like overhanging mono-bosom; the concave boyish form of the '20's; the end of a fish's tail into two flippers of feet at the bottom of the hobble skirt; and the lady, of the '80's whose figure literally conformed to her tremendous bustle.' Press Release for *Are Clothes Modern?*, Museum of Modern Art, New York.

26. During preparation of the exhibition, Rudofsky was invited by Joseph Albers to teach a class in the summer session of 1944 at Black Mountain College (North Carolina). Outlining his course, Rudofsky portrayed contemporary dress as 'anachronistic, irrational, impractical, harmful . . . dictating our behavior, dominating and conditioning all phases of life.' In regard to the lack of mediation, apparel was situated as simply inseparable from architecture, an allusion corroborated in the title of his lecture: 'How can people expect to have good architecture when they wear such clothes?' cited in Mary Emma Harris, *The Arts at Black Mountain College* (Cambridge, MA, MIT Press, 1987).
27. Wall panel from the exhibition. Department of Registration Exhibition files, MoMA Exhibition #269.
28. Rudofsky, *The Prodigious Builders*, p. 12.
29. Press release for *Are Clothes Modern?*, Museum of Modern Art, New York.
30. James Thrasher, 'Designer makes plea for reform of dress', *Post* (Cincinnati OH, 12 December 1944). See also Edward Allen Jewell, 'Art: so many things', *NYT* (Sunday 3 December, 1944), p. 8X. Jewell noted that Rudofsky's wavy floor (which he likened to a high-relief topographical map) 'rather alarmingly complicates the problems of postwar peace.'
31. While rarely citing sources, it appears that Rudofsky was conversant with many debates within German aesthetic theory, for instance Alois Riegl's optic/haptic distinction. On surrounding debates see Harry Francis Mallgrave (ed.), *Empathy, Form and Space: Problems in German Aesthetics, 1873-1893, Texts and Documents* (Santa Monica, Getty Center for the History of Art and the Humanities, 1994). Moreover, these debates widely permeated German discourse on architecture and design (with which Rudofsky was familiar) through their influence on the thinking of members of the *Werkbund*. On this see Frederick J. Schwartz, *The Werkbund: Design Theory and Mass Culture before the First World War* (New Haven and London, Yale University Press, 1996).
32. *Interiors*, New York, January 1945.
33. These were designed by Irene Schawinsky.
34. The wall text continued: 'Egyptians, Persians, Hebrews, Greeks, Etruscans and Assyrians used dinner couches. The cultured Romans took their table manners from the Greeks and at the time of Christ, the civilized world dined in a recumbent position. Today, despite Christ's example, the reclining position is considered improper and is associated only with Roman banquets.' Department of Registration Exhibition files, MoMA Exhibition #269.
35. Rudofsky, *Are Clothes Modern?* (1947), p. 52.
36. I would like to acknowledge the kind assistance of Dr Juliane Mikoletzky of the Universitätsarchiv at the Technische Universität, Vienna, for providing me with access to this document, and the records of Rudofsky's student years.
37. Rudofsky's fascination with 'primitive' cultures was common to many modern architects – such as Adolf Loos, Le Corbusier, Mies van der Rohe, and later Siegfried Giedion – with whom he was familiar or even acquainted. European archi-

- texts who arrived in the US during this period had reconstructed their projects in various ways as a result of this encounter. For some recent accounts of the translation of European modernism into the US see, for instance, essays in: Robert E. Somol (ed.), *Autonomy and Ideology: Positioning an Avant-garde in America* (New York, The Monacelli Press, 1997).
38. *Time*, 11 December 1944, p. 50.
 39. This reversal of priority, in its lack of historical specificity, foreclosed to critical examination the structuring of that hierarchy: as the terms were *never* situated equivalently they could not be so easily exchanged. It is, rather, the instability of terms effected by the collapse of bounded categories that opens up a space of re-articulation and acknowledgement of difference. See Clifford, 'Histories of the tribal and the modern', in *Predicament of Culture: Twentieth Century Ethnography, Literature and Art* (Cambridge, MA, Harvard University Press, 1988), pp. 189–214.
 40. Rudofsky, *Are Clothes Modern?* (1947), p. 229.
 41. In 1938, curator John McAndrew inaugurated a series of exhibitions around the theme of 'Useful Objects'. Various titles: 'Useful Household Objects under \$5.00' (1938), 'Useful Objects of American Design under \$10.00' (1939), 'Useful Objects in Wartime under \$10.00' (1942), this series ran until 1949, when Philip Johnson was reappointed as director of the department of architecture. Rudofsky's interest in the standardisation of objects of design also keys into earlier debates around the type or *Typisierung* central to the *Werkbund*. On these debates see Schwartz, *The Werkbund*, pp. 121–146.
 42. Rudofsky *Are Clothes Modern?* (1947), p. 229.
 43. 'The dealer in fashions will deride such proposals as utopia, or he may impute dictatorial tendencies. Utopia in clothing, or as we should call it, the absence of dress fashions, can be found in this world among peoples who have an old enough cultural heritage to benefit from it. Only the white race [sic] has adopted the artificial rotation of clothing fashions and tries to convince the others of its advantage.' Rudofsky, *Are Clothes Modern?* (1947), p. 230.
 44. 'Today, the costumes of racial or regional groups are mostly picturesque anachronisms; generally, they are national uniforms, changing slowly, sometimes remaining stationary for entire generations.' Rudofsky *Are Clothes Modern?* (1947), p. 223.
 45. This historical shift was recognised in anthropological discourse in 1954 when Claude Lévi-Strauss in a short reflection on 'Anthropological Museums' wrote of a radical historical change in the flow of people and objects. He argued that 'the expansion of Western Civilization, the development of communications, and the frequency of travel that characterizes the modern world have all helped to make the human species "fluid"'. For Lévi-Strauss such an historical condition meant that anthropological research might now take place within large industrial urban centres. 'Today there are practically no such things as isolated cultures; to study a given culture, as a rule, it is no longer

necessary to travel half-way around the world and 'explore'. The population of a great city like New York, London, Paris, Calcutta or Melbourne, includes representatives of highly differing cultures . . .' Claude Lévi Strauss, 'The place of anthropology in the social sciences and problems raised in teaching it', trans. Claire Jacobsen, Brooke Grundfest Schoepf, in *Structural Anthropology* (Basic Books, 1963), p. 377.

46. Rudofsky *Are Clothes Modern?* (1947), p. 223.

47. *Ibid.* p. 19.

48. 'Only a few years ago, many peoples used to bathe in public without the aid of clothing,' he wrote. 'This custom, we are learning, is rapidly

disappearing due to the protests of foreign travelers.' Rudofsky, *Are Clothes Modern?* (1947), p. 19.

49. While at times Rudofsky directed his concerns towards the plight of indigenous peoples, his polemic was more often simply posed in relation to the utility of the cultural habits of those cultures to a programme of readjusting the outlook and lifestyles of people from industrialised Western countries. He did believe, however, that this would aid in the development of tolerance for cultural alterity.

The networks of tropical architecture

Hannah le Roux

The concept of tropical architecture is one that was constructed in the 1950s to link the work of modernist practitioners in a number of locations outside the West. Tropical architecture has been represented as a form of critical regionalism, in that it offers a language based in the conditions of the non-western world. While this may be true of the movement in the Americas, in the case of the British colonies of West Africa tropical architecture was located within the networks of modernist and colonial culture as much as it was place bound.

Tropical architecture was established in the metropolitan architectural circles of the 1950s through the use of the term in books and journals, a conference and a course of specialisation in London. These forms of support assisted architects to create modern architecture in far-flung sites, under difficult conditions. Despite this enmeshment of the peripheral sites of practice with the colonial metropolis through communications, tropical architecture was seen as something other than colonial architecture. The changing political and economic opportunities at the end of the colonial period prompted architects to develop a post-colonial identity for architecture, which was done through the representation of their approach as one that could transcend national boundaries. Tropical Architecture in the Humid Zones, by Fry and Drew explicitly offers support for an imaginary architect who comes from a generic tropical zone.

The influence of the metropolis on the culture of tropical architecture remained significant, even after independence. While the consistency of approaches that marked the work of the 1950s has been replaced by a multiplicity of attitudes to design, the contemporary literature, curricula and research on African architecture share an emphasis on its climatic conditions. This content, in turn, ties the approach to authoritative sources in the West, giving it an identity that links the local and the global in complex and interdependent ways.

Introduction

In the title of a recent book,¹ tropical architecture is linked to critical regionalism. In the authors' view, tropical architecture is an indigenous form of expression that grew from the differences between international, western modernism, and local practices in the developing world. This experience, however, which is founded mainly in the

Americas does not necessarily hold true for West Africa. In the colonies of France and Britain, tropical architecture was first established in the post Second World War period by expatriate architects aligned to modernism, and only taken up by local practitioners when they first opened practices around the time of independence at the end of the 1950s.

In Britain's West African colonies of Nigeria and the Gold Coast, now Ghana, architectural practices Fry and Drew, the Architects Co-Partnership, James Cubitt and Associates and Godwin and Hopwood designed the infrastructure of the colonial system. The scope of work (figs 1–4) included town and village planning, a considerable number of educational buildings, houses for expatriates, commercial buildings and government offices. The work of these practices between the late 1940s and the early 1960s shows a remarkably cohesive attitude towards design, specifically in their response to climatic conditions.

This coherence is all the more remarkable given the distances between Britain and the sites of practice in Africa and elsewhere. Rather than being a form of place-bound resistance, tropical architecture in West Africa seems to have grown out of conditions of displacement and compensatory linkages. The story of this period reflects the influence of the networks of architecture, as much as of its products, on a group of architects and its succeeding generations. In particular, the relation-

ship between a centre of knowledge in London and Britain's colonial territories in the tropics spread and framed the production of tropical architecture. In this respect, the influence of metropolitan culture remains apparent in modern West African architecture, even after independence. What does this say about the identity of a form of regionalism such as tropical architecture?

An architecture for all seasons

The spread of modern architecture to the countries outside the West in the 1950s can be associated with developments in climatic design and communications. New forms of climatic design, building on the work of prewar architects who had extended the early, European phase of modernism into approaches that would suit sites elsewhere, were promoted through the media, education and technical support to architects in the tropics. This publicity established the concept of 'tropical architecture' as an orthodoxy for practices abroad by the early 1950s. A common attitude to design, in which architects drew off each others' experiences and had access to technical information, runs through the body of built work of the decade in the former colonies of West Africa.

Prior to the 1950s, several architects had experimented with alternatives or additions to the sheer and well-glazed façades of modernism that, although useful in the winters of Western Europe, performed as greenhouses in warmer conditions. A Greek architect, Stamo Papadaki, had experimented with the use of sun breakers and deep overhangs to control sun penetration prior to 1921.² In the 1929 design for her seaside house, E1027, Eileen

Figure 1. Fry, Drew and Partners University of Ibadan, Nigeria 1947–1951. Dormitory blocks in 2002 (photograph by Hannah le Roux).





Figure 2. Architects' Co-Partnership Ansar-ul-Deen School, Lagos, Nigeria, 1957 (photograph by Architects' Co-Partnership).

Gray used a variety of shading devices, including adjustable, sliding louvres and canvas awnings to allow variable control of the sun.

In the 1930s, Brazilian architects began to effect sun control through the design of building façades with a strong formal effect. Between 1936 and 1943, Lucio Costa and colleagues, with le Corbusier as a consultant, designed a new office building for the Ministry of Education. The design used sets of adjust-

able horizontal louvres, set into a three-dimensional gridded façade made from reinforced concrete, to allow ventilation and the entrance of solar radiation to be controlled from inside the building.³ The aesthetic effect of the tall building with its ever-changing contrasts of light and shade was startling and innovative. Le Corbusier claimed credit for the idea, somewhat belatedly, in a section on the *Brise Soleil* in the 1946 edition of his *Complete Works*.⁴

Figure 3. Cubitt Scott and Partners College of Technology, Kumasi, 1951 (photograph by James Cubitt Associates).



The Brazilian application of the brise soleil gave a solution that would allow the use of glazed façades in hot climates.⁵ It is not surprising that Le Corbusier's development of the brise soleil follows the expansion of his career into the hot climates of Tunisia, Algeria, Brazil, and India between the 1930s and 50s. Le Corbusier's leading role in the avant-garde modern movement gave his use of the brise-soleil an authoritative stamp, and claimed it from the Brazilians for an international application, fulfilling his vision of an 'international' architecture.

Le Corbusier's experimentation with climate recalls other modernist research into solar ingress in

housing. Walter Gropius and Hannes Meyer had used sun diagrams in the 1920s in order to create rational standards for building spacing. Their concern was with allowing sufficient sunlight to enter buildings, in contrast to the dark conditions in which many people lived in European cities. Although the post-war modernists were concerned with reducing heat and glare, these precedents were influential in establishing climatic thinking in the design of buildings. The use of diagrams as an explanatory tool was another technique that was to prove influential.

Almost simultaneously with the publication of Le Corbusier's account of the brise-soleil, the American avant-garde was establishing its own vocabulary of practices for hot climates. Frank Lloyd Wright's interest in the climatic aspects of architecture had played out in the use of elements such as water, thick walls, deep overhangs and ventilation. Although Wright did not design in a hot and humid climate, his former student and collaborator, Antonin Raymond, was the co-designer of an influential tropical house for Guam around 1946⁶ that served as a prototype for official American housing abroad, and is echoed in the design of the American embassy in Ghana.

Events around the Second World War created a diaspora of modern architects from Germany and spread the rationale of modernism to new sites including those of the tropical southern parts of the United States. Walter Gropius was appointed as head of the Harvard Graduate School of Design in 1937. Amongst his early graduates was Paul Rudolph, whose designs for houses in Florida in the 1940s develop the use of shading devices and



Figure 4. Godwin and Hopwood Boyle Street Residence, Lagos, Nigeria, 1956 (photograph by John Godwin and Gillian Hopwood).

sliding doors in response to heat. Richard Neutra, another architect with roots in European modernism based in the United States, experimented with shading and pivoting walls in designs for schools and clinics for Puerto Rico in 1944.

Information about these experiments was circulated amongst architects in different ways. Rudolph, Raymond and Neutra all had their work published in professional journals while le Corbusier's extensive contacts with other architects through the CIAM congresses and his travels put him in a leading position to articulate and define new directions. The influence of this work on the British definition of tropical architecture is overt.

The modernist experiments in hot climates reached British architects through their contacts with key figures in the modern movement as well as through journals. In the 1930s, Maxwell Fry, as a member of the so-called MARS group, had participated in CIAM congresses, and between 1934 and 1937 he went into partnership with Walter Gropius who was in exile from Germany. In their positions as editors of the *Architect's Year Books*, Fry and his wife, Jane Drew, sourced images of international work.

The architecture of British modernists in the tropics shows qualitative similarities and differences when compared with pre-war experiments in climatic responsiveness. As had happened in Brazil, a number of practitioners working in contact with each other constructed a collective architectural approach by sharing their experiments. As in pre-war modernism, the architectural mass media and conferences were used to disseminate these approaches to fellow practitioners. Scientific approaches to climate were used to justify formal decisions.

In contrast to the earlier experiments, few of the buildings produced in international British modernism have been singled out as remarkable innovations in a formal sense in subsequent histories. Their built work was widely, rather than extraordinarily innovative in that it rapidly absorbed modern concepts into many different types of buildings. In this sense, it drew many of the forms first invented in the pre-war period, such as the *brise soleil*, raised floors and adjustable *louvre*s, into use in the every-day built environment of colonial settlements.⁷

More significantly, the British architects who practised in the tropics managed to construct the concept of tropical architecture as a unified approach to design for the tropics. This was orchestrated through the representation of tropical architecture as a progressive movement in books and journals, a conference, and the development of course material. The period could be seen as one in which institutional support transformed experimental ideas into a new orthodoxy. These media functioned as a space of dialogue between practitioners and theorists.

The Conference on Tropical Architecture held at University College, London in 1953⁸ was a critical event in the development of the idea of a specific approach to architecture. The conference was centered on technical concerns, with a day devoted to climate, another to a visit to the Building Research Station in Watford and a third to construction issues. These were preceded by a discussion of planning problems and concluded with another on 'the Position of the Architect in the Tropics'.

By holding the conference, members of mainstream British practice acknowledged the opinions voiced by foreign students that there were absences in the canon of architectural education. The event was suggested by a Nigerian architect-in-training, Adedokun Adeyemi. As Koenigsberger explained later,

By 1953 students of architecture from tropical countries had begun to complain that they were learning all about snow loads on roofs and about fireplaces but next to nothing of the design of houses in hot climates.⁹

At the same time the conference provided support for British architects with an interest in work in tropical countries, and an opportunity for practitioners who had worked in different tropical locations to compare experiences.

Most of the speakers were British. Although students from tropical countries had motivated and participated in the event, they were not represented in the list of speakers.¹⁰ Only the discussions record their names and home countries: Jaiyesmi (Nigeria), W. Lim (Malaysia), H. Lawson (Jamaica), S.D. Sane (India) and so on. The somewhat passive role assigned to the 'tropical' voices in this conference is similar to that within other media on the subject of tropical architecture.

The conference had several direct consequences within the media and institutions of the professions. The first was the establishment of a specialist course in Tropical Architecture that was located at the Architectural Association in London. The six-month course first ran in 1954 and augmented subjects in the main school of architecture to cover 'those aspects of architecture where problems are different

under tropical conditions'.¹¹ In the beginning the department was concerned almost exclusively with the teaching of climatic design.¹² By 1959 the course had strong technical input from researchers at the Building Research Station and the London School of Hygiene and Tropical Medicine as well as lecturers in anthropology, housing and economics.

In October 1953 and January 1954, *Architectural Design* published two special editions on Tropical Architecture, edited by Otto Koenigsberger, which built on the themes of the conference.

At the Tropical Architecture Conference in London last spring, it became obvious how enormous is the task facing planners and builders in the tropics, and how great is the need for the accumulation and dissemination of information on the whole subject of building for the tropics. A great number of architects practising in this country are now taking on large contracts in the hotter regions, so the whole of this issue of *Architectural Design* is devoted to such work.¹³ The issues published the work of James Cubitt, Fry, Drew and Partners, Nickson and Partners from West Africa alongside work in the West Indies and other African sites and brought recognition of the field to the mainstream readers of the professional journal.

Several other articles on tropical architecture followed in the 1950s, and in 1956, the first of a number of practical manuals aimed at students and practising architects was published. Maxwell Fry and Jane Drew used the term 'Tropical Architecture' in the titles of both of their manuals,¹⁴ which gather together case studies and data from diverse countries. A similar, but more modest book on tropical houses was published by

David Oakley,¹⁵ who had worked in Jamaica. Textbooks published for students included a Grammar of architectural design with special reference to the tropics¹⁶ and a guide to construction in the tropics.¹⁷ Work from Africa also appeared in a series of articles, divided into tropical and temperate sites, published in the two special editions of the *Architectural Review* edited by Nikolaus Pevsner¹⁸ and subsequently issued as a book on *Commonwealth Architecture*.¹⁹

The most thorough technical guide on Tropical Architecture was probably the manual compiled from lecture notes and feedback from former students by Koenigsberger, who taught on the subject of climate in the course on Tropical Architecture. However, this was only published in 1974. In the meantime practitioners had technical guides from the Building Research Establishment for support. Published as *Colonial Building Notes* and later as *Overseas Building Notes*, these covered topics such as thermal comfort and building materials.²⁰

A certain amount of material was available from other countries. Aronin's survey, *Architecture and Climate*,²¹ and the works of the Olgay brothers²² (1963) mainly covered built work and research from the Americas. A professional journal, *The West African Architect and Builder*, was published in West Africa in the 1960s.

The colonial governments provided some institutional support for architects largely through the work of the Building Research Stations. In the British colonial system these were located in England, Australia, Ghana, India and South Africa.²³ Literature such as the Building Research Establishment's *Colonial Building Notes* and officials

like G. Anthony Atkinson, the BRE's colonial liaison officer, communicated research on climate and materials to professionals. From 1948 onwards, Atkinson had coordinated research from the West Indies, the Sudan, Nigeria, South Africa, Australia, Singapore and Ghana, and mooted the establishment of an East African organisation.²⁴

Despite this support the material that actually reached practitioners was regarded as inadequate for the needs of architects in foreign situations. Atkinson mentions 'Housing in the West Indies' and the *Information Books of the Nigerian Public Works Department*²⁵ as the few guides to practice an architect might have at his [sic.] disposal. Such local bye-laws that existed were 'rarely up to date'.

The practice of tropical architecture was often challenging. Architects who had studied and often worked in Britain were confronted with very different physical and intellectual conditions in sites such as West Africa. Internal travel took days, the expatriate community was small, and advice often difficult to obtain.

Other built environment professionals, in particular engineers, played an important role in disseminating technical knowledge between practitioners. Ove Arup, the engineer who consulted on most of Fry and Drew's work and who also worked for other architects in West Africa and Europe opened a branch office in Lagos in 1954. As a pioneer in reinforced concrete design, Arup certainly helped to refine the design of the brise-soleil elements that are common in tropical buildings. Informal relationships between colleagues also played a role. As John Godwin and Gillian Hopwood recall, architects visited each other's

work, and met socially at places like Lagos's yacht club, where they compared experiences.

Yet another source of support was from the companies involved in the manufacture of goods used in the production of buildings. Henry Hope and Sons, for example, who manufactured windows in Birmingham, had offices in London and New York and agents 'around the world'. Their advertisement in the proceedings of the Conference on Tropical Architecture shows the complex steel louvres used by James Cubitt in Kumasi, and offers advice on 'all window problems'. Crittall Windows, an associated company, had branches and agencies in dozens of tropical countries, including Nigeria, Ghana, Sierra Leone and the Gambia. Their catalogue (Fig. 5) included details that informed architects how to use their products, including an 'export range' of adjustable windows and sunbreakers.²⁶

Manufacturers such as these served as conduits for the spread of technical information and norms between architects. The design of the sunbreakers for Godwin and Hopwood's offices for Allen and Hanbury (Fig. 6) was worked out with technical advice at Crittall-Hope's Birmingham premises, where it became a part of the standard range.²⁷

The last source of support was certainly the expatriate building contractors working in West Africa. In Nigeria, the firms of Cappa and Cappa d'Alberto brought a particular expertise with reinforced concrete construction to the many projects that they built for practices such as Fry and Drew, Godwin and Hopwood and the Architects Co-Partnership.

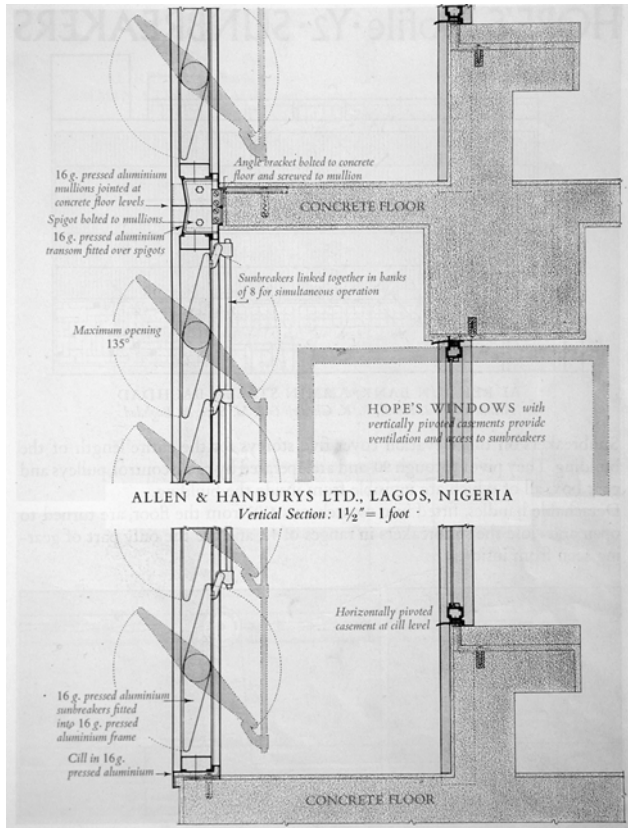
Tropical architecture in the humid zones

What we can do here in treating the architecture of the tropics is to attempt to arrange what knowledge and vocabulary we have, and can collect, upon the subject, that will augment, define and perhaps refine the vocabulary that each reader may bring to the creation of new works of architecture.²⁸

Fry and Drew's 1956 manual was a significant document in the definition of the concept of tropical architecture. Above everything the book is a practical record of the knowledge accumulated by the authors in over a decade of work in the Gold Coast and Nigeria. In this respect it is a kind of treatise in the tradition of Renaissance architects and modern authors such as Gropius and le Corbusier. Like a treatise, the book has a layout that an architect might find rather practical. Most of the chapters describe a building type, the House, Educational buildings and so on, reflecting the type of commissions the authors undertook.

In the final section of the book, the authors defer to the technical authority of external sources through the use of charts, appendices and building research stations. This information is intended to help other architects deal with the physical aspects of tropical building and site conditions. The relationship between this section and the main text raises some questions. It seems to suggest an unresolved integration of scientific processes and data and the buildings discussed in the main body of the text. It may be that scientific data were unfolding too rapidly for assimilation into design, or that scientific knowledge was fragmentary in relation to

Figure 5. Crittall Hope 'tropical' window sections (photograph by Hope Windows).





architectural knowledge that is arranged around the resolution of the building. Whatever the reasons for its arrangement, it is clear from their inclusion that scientific data were considered a necessary part of the knowledge of tropical architects.

At the same time as it records the authors' own practice, the manual records a broader world of work, represented by images of buildings by architects from around the globe. In this respect it has a programmatic agenda that attempts to define an emerging field of architecture that transcends international boundaries.

The internationalist trend of the book reflects the experience of the authors in modern avant-garde circles. Scattered through the book with no geographic hierarchy are images of buildings in the Gold Coast, Florida, the USA, Mexico, Brazil, Nigeria, the Ivory Coast, Brazzaville, French West Africa, India,

Burma, Sierra Leone, the Cameroons, Venezuela, Senegal, Cuba, the Philippines, Puerto Rico, Togoland, Barbados, Jamaica and Kenya. The work of Richard Neutra, Paul Rudolph, Oscar Niemeyer, Lucio Costa and Antonin Raymond is included alongside the lesser-known work of Henri Chomette in Abidjan, Mario Pani in Mexico and Rino Levi in Brazil.

The listing celebrates the international and canonical status of modernism. Fry and Drew appear not to have chosen their examples as singular figures, since the photograph captions in the text name the sites, but not the architects, whose names appear in a list of figures. Their approach seems to privilege an appreciation of architects as members of the modernist circle, rather than as individual architectural heroes. At the same time they assume that their readers share a certain familiarity with the leaders of modernism. For instance, in the text, the authors use an 'imaginary Mies van der Rohe house' as a concept to help visualise a generic tropical building. This cubic volume with glazed walls, placed in a hot climate, must be orientated and shaded to deal with the climate.

Another, equally prescient assumption that Fry and Drew make in the text is to see a growing number of their protégés as architects who come from the tropics. The authors claim in the introduction that their intentions are to shape the development of architectural work beyond their own.

We write not only for those who, like ourselves, live outside the tropics and for whom, therefore, designing is something of an intellectual process; but also for the growing number of those who inhabit these regions and who, by their overfamiliarity with the conditions, may be stimulated

Figure 6. Detail of sunbreakers, Godwin and Hopwood, Allen and Hanbury's Building, Lagos, Nigeria, 1958 (photograph by John Godwin and Gillian Hopwood).

to re-examine them. On these architects and planners falls the major burden of creating an environment in which the tropical people may flourish.²⁹

In this sense, the publication of *Tropical Architecture* intended to engage with an imaginary that is nascent. The book attempts, on the one hand, to give shape to emergent global practices, through the use of examples that cut across boundaries, and that generalise the social conditions within different tropical cultures. At the same time, they encourage their readers to look beyond local perspectives and imagine an as-yet-unbuilt architecture.

Fry and Drew's concern to stimulate or shape an imaginary, future architecture of the tropics on behalf of others is not unique. The educational programmes developed in the 1950s to facilitate the dissemination of knowledge from metropolitan centres to the sites of application in the tropics reflect a similar desire. The construction of tropical architecture relied on the institutional development of properly trained and internationally sanctioned 'tropical architects'.

From colonial architecture to tropical architecture

Although several texts on planning and building used the term 'the tropics' prior to 1953, the concept of 'tropical architecture', which the Conference on Tropical Architecture authoritatively gave to the field seems to have come into being as the term 'colonial' became politically inappropriate. Two examples reflect the changing terminology associated with design abroad. S.M. (Leo) de Syllas, who helped organise the 1953 conference on trop-

ical architecture had earlier co-authored an article on 'Recent Planning Developments in the Colonies'.³⁰ The technical guides from the Building Research Station in Garston that had been issued under the headings Colonial Building Notes became the Tropical Building Notes in 1958, slightly behind the independence of India in 1948 and the Gold Coast, that became Ghana in 1957.

These changes reflect two shifts in the relationship between the architectural profession and foreign contexts. The first is the increase in the number of architects from 'tropical' countries being trained in Britain and in foreign schools. The second is the growth in opportunities for British architects abroad as the governments and private interests in newly independent countries embarked on programmes of modernisation. In 1953, there were as many as two hundred students from tropical countries studying in Britain and between twenty five and fifty British architects had gone to work in the tropics in the previous year.³¹

As one of the speakers in the Conference on Tropical Architecture mentioned, the end of colonialism threatened the direct hold British practitioners had on colonial building. The architect, who at the time was a colonial functionary, might shortly be replaced by a local person. Even before decolonisation it was understood by British professionals that some sort of expertise in tropical architecture would be required in order to gain commissions in the future.

We must remember that our clients are more and more the people of the tropics, not Europeans; that we have to work there as equals, only privileged because of our special knowledge.³²

Following independence, Nigeria exercised 'indigenisation' rules that compelled expatriate architects to work with local partners. Under these changing conditions, British architects took an increasing interest in the development of local architects. This should be someone trained in the metropolis, but according to a modified curriculum, or a graduate of proposed tropical schools of architecture. To this end new schools were proposed for Hong Kong, India, Ghana and Nigeria amongst others. Typically, the school in Ghana established at the University of Science and Technology in Kumasi

in the 1950s was initially staffed by expatriate British architects. A graduate from the Architectural Association course, John Owusu-Addo, became the first Ghanaian lecturer on his return in the 1960s.³³

The post-colonial work opportunities for foreign architects were more limited than in the post-war period, but some British architects such as Kenneth Scott, Alan Vaughan-Richards and the husband and wife partnership of John Godwin and Gillian Hopwood chose to remain in West Africa and continued to practice in association with local architects (Figs 7–8). Amongst the practitioners who left,



Figure 7. Kenneth Scott, British Council Offices, Accra (photograph by Hannah le Roux).

Figure 8. Alan Vaughan-Richards, Chalet, Ikoyi, Nigeria (photograph by Hannah le Roux).



however, it is interesting to see how the experience of West Africa initiated their international careers. Fry and Drew went on from Ghana to practice in India, Kuwait, Nigeria, Iran and Ceylon while maintaining a London office.³⁴ James Cubitt founded offices in Nigeria, Libya, Australia and the United Arab Emirates as well as England.

These biographical histories indicate that some architects managed to conceptualise a way of practising that could be applied to other geographical sites. For Fry and Drew, the concept of tropical architecture could be used to guide their work in new contexts. While they speak of wanting to

develop an intellectual approach,³⁵ it is one that had practical benefits for their own careers. Their concern with training future architects was in part responsive to the absence of suitable staff on site and the resultant challenges of working between a London production office and West Africa. In Fry and Drew's vision, tropical architecture represented a supportive common approach between architects working between locations in the expanding world of architectural opportunities.

Colonial networks

The development of tropical architecture cannot be seen apart from the way in which the approach itself was located and moved as it spread between the sites of practice, in West Africa and other colonial or post-colonial contexts, and a metropolitan centre. This spatiality is tied to the flows that accompanied Britain's role in development. Tropical architecture happened through the patronage of the British government which spent millions of pounds building in its overseas colonies, and provided institutional support, such as the collaboration of the Colonial Office and the Building Research Station in setting up the Colonial Liaison Unit in 1948 to disseminate information on housing and planning matters to practitioners in the tropics.³⁶ Information on tropical architecture was disseminated as a body of knowledge through British researchers and publishing houses. The architects, students, books and exotic building materials of tropical architecture moved between Britain and colonial locations on trade routes established by colonial interests.

King³⁷ has noted that the culture of the post-colonial is built on the economic and political

networks of the colonial system. Certain nodes within these networks, the so-called world cities or metropolitan centres such as London serve to coordinate and disseminate information between peripheral areas. Through this, they become dominant locations in the development of culture. The reflexive role of such post-colonial culture is to reinforce the authority of the centre.

Tropical architecture can be seen as an expression of such post-colonial culture. London was indeed a central node for the forms of support that the tropical architects used, whether educational institutions, research stations, media or professional colleagues. It was the site from which knowledge from the periphery was absorbed, recorded and disseminated. It is not surprising then that the institutional arrangements of British architecture continued to play a significant role in the development of tropical architecture, even after independence.

Almost all the media representations of tropical architecture emerged from metropolitan centres. The Conference and course on Tropical Architecture, the journals and textbooks on the subject, and the Building Research Establishment's notes came from Britain. Collaborative work between the metropolitan centre and the periphery was usually written and published in the metropolis. The building research centres in India, Australia and South Africa produced material, but practitioners in other locations only gained access to this through the Building Research Establishment's agency. A 1960 publication by the Commission for Technical Co-operation in Africa South of the Sahara, an agency set up to facilitate ties between research institutions, listed stations in 14 African and 3 European countries.³⁸

The organisation's secretariat was shared between Lagos and Bukava in the Congo, but the publications bureau was in London.

The manual on tropical housing and building³⁹ that grew from lecture notes on climatic theory given in the course on Tropical Architecture was illustrated through the examples submitted by Koenigsberger's colleagues and former students in the tropics. Koenigsberger travelled in the tropics but was based at the Development Planning Unit in London, at a key nodal point within an international network.

From tropical architecture to regionalism

In the period that succeeded decolonisation the concept of Tropical Architecture as a defined field unravelled. The orthodoxy of practice that characterised the 1950s was replaced with a fair amount of experimentation and diversification. In Nigeria, Alan Vaughan-Richards used the forms of local earth architecture in the design of houses, and in Ghana, expatriate architects within the Public Works department developed innovative staff housing that drew on vernacular layouts and built form. Commercial architecture in West Africa and elsewhere in the tropics increasingly used air conditioning as it became cheaper and easier to run as power grids were laid out, and many architects replaced climatic-responsive features with other elements. In some cases, the result was the proliferation of international style blocks that resembled western buildings in their use of sheer façades of reflective or tinted glass.⁴⁰

Within the architecture profession, the concept of a Commonwealth identity for architectural

practices and education was promoted. It was institutionalised with the foundation in 1965 of the Commonwealth Association of Architects (CAA) as an umbrella body representing schools and professional institutes in countries in, or formerly in the British Commonwealth.⁴¹

The emphasis in the course in Tropical Architecture at the Architectural Association moved from technical to social dimensions of design, recognising the concerns of an increasing number of foreign students.⁴² The curriculum increasingly dealt with housing and developmental issues, and the name was changed to the Department of Development and Tropical Studies. In 1972, the course moved to University College London where it became known as the Development Planning Unit. In Ghana, the school established at Kumasi tried to fulfil Nkrumah's vision of a developmental agency. By the mid 1960s, the course aspired to 'comprehensive social and environmental design', dismissing the concept of architecture as 'foreign to Africa'.⁴³

Nonetheless the precedent of tropical architecture has remained as an important point of reference for practice in the post-colonial world. A number of recent publications engage directly with this legacy.⁴⁴ Moreover, school curricula within Africa as well as postgraduate studies in the West carried out by African students seem to show an exceptional emphasis on the study of climate.⁴⁵

Conclusion

The underdocumented history of tropical architecture as it emerged in post-war Britain and its colonies is an instructive tale of the relationship

between the profession and broader geographies. Rather than arising as a form of place-bound resistance, tropical architecture emerged from linkages made possible by modern communications within the spatial systems of colonialism. In particular, the networks that linked the metropolitan centre and the peripheral sites of practice are an important aspect of the movement's identity.

Figures such as Fry and Drew, Cubitt and Koenigsberger creatively worked their careers and knowledge into the networks that characterised a world between colonial and modernist systems. While travelling, writing, teaching and reporting on their work at home and abroad they produced the concept of tropical architecture within the media of texts, conferences and educational programmes.

Tropical architecture both built on and benefited from the relationship between London and its tropical peripheries. Architects in West Africa relied on support from Britain for technical matters and to disseminate their work. The authoritative institutions located in the metropolis served to alter the conditions of tropical architecture in multiple ways. The media made the work of architects in remote locations visible to their colleagues. Institutions lent authority to the discourse of climatic responsiveness by linking it with established scientific fields. The media and educational systems allowed architects to share knowledge and material, and trained architects from tropical countries in the techniques of climatic design.

The metropolitan profession reacted to the conditions under which tropical architecture was produced, in particular the potential changes of patronage at the end of the colonial system.

Through journals, conferences and educational arrangements they defined and publicised the international and modern nature of the expertise of colonial architects, and helped to attract the patronage of the post-colonial elite. At the same time, through texts and curricula, metropolitan architects attempted to define the vocabulary of the new generation of tropical architects. Through these means tropical architecture reproduced itself, and in the process, shaped the architectural language of the post-colonial world.

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Part 7

Identity and the appropriation of place

The global range of texts contributed by a variety of international authors provides evidence of the JoA's 'open' editorial policy. Issues of regional identity, and its appropriation, inform several papers' examination of different national contexts.

Chunlan Zhao's carefully researched study of the vicissitudes of the *lilong* housing typology in Shanghai is a poignant reminder of the virtues of Venice School methodology. This informs an objective look at the transformations of a transitional type associated with a gradual commodification of development and changing patterns of social life, without prejudging the virtues of traditional form or the limitations of modernity. It shares an Italian connection with Elisabetta Andreoli's *Identity and memory in the modern metropolis*, which sets out its initial premise with reference to Aldo Rossi's urban theories. Discursive consideration of the Bexiga district in São Paulo, shows different ethnic cultures providing a *locus* for socialisation; later to be re-invented as an exotic *other*, servicing more affluent neighbourhoods and the tourist industry. Andreoli sees this evidence of global trends as antithetical to Rossi's conception of urban 'permanences'. In a related South American context, René Martinez Lemoine's *The classical model of the Spanish-American colonial city* takes issue with generalised assumptions about the historical origins of the less than 'ideal', grid-cities of the New World. He traces their conception to more diverse circumstances than Charles V's imperial charter, misleadingly associated with the codification of this model.

The other paper focuses on the vernacular culture of building in Eastern Tibet. Suzanne Ewing's fieldwork examines patterns of nomadic life, which provide the context for a domestic development from the indigenous black-tent to the traditional house type. These are examined in terms of Gottfried Semper's archetypes of hearth, and 'textile' construction, and situated in the contentious context of contemporary Chinese 'colonisation' of the territory. The exclusion of this local culture (seen as a part of the landscape, but not of society), lend it increasingly the character of a 'lost world'.

It is salutary to be reminded that Semper's premises are located in the transition from a nomadic to a more settled culture. Perhaps this is why they are conversely attractive to theorists of the contemporary avant-garde (at odds with formal typologies and preoccupied with the exigencies of urban nomadism).

Identity and memory in the modern metropolis: elements for a discussion. The case of São Paulo

Elisabetta Andreoli

This article addresses the question of identity and memory in the ever-changing environment of the modern metropolis. It considers the case of São Paulo, focusing on a specific borough. It analyses the complex interplay of a borough, seen as a locus of resistance for the preservation of the culture and memory of a group, with the surrounding dynamism of a fast-expanding city. It points to the limited role played by architecture and the built environment in providing useful clues to interpret the metropolitan experience, underlining the need for new methods of inquiry.

Introduction

In *The Architecture of the City* Aldo Rossi¹ discussed the way in which architecture could function as a link between new ways of life – present and future – and the past by referring to forms inscribed in the collective memory of the citizens. While Rossi's main terms of reference were the historical European cities, I was interested in investigating the question of memory and identity in relation to the modern metropolis whose built environment is in a constant and rapid process of transformation.

I have chosen for my inquiry the city of São Paulo, where I used to live, and which I recently revisited after a period of 15 years. With its 16 million inhabitants and its formidable financial, industrial and administrative apparatus, the city of São Paulo functions as the economic, political and cultural capital of Brazil. Forty per cent of wealth produced and exchanged in the country passes through São Paulo. This alone makes it an extremely dynamic and fascinating place, in which the 'intensification of nervous stimulation' provoked by 'the swift and uninterrupted change of

outer and inner stimuli' described by George Simmel² is constantly at a high level. In addition, since emerging as an important urban centre at the end of the last century, São Paulo has been a place of multiple cultures. In 1920, two-thirds of its 580 000 inhabitants were immigrants and today São Paulo hosts the largest Japanese community outside Japan, together with Europeans, Lebanese, eastern European Jews and, most recently, Koreans. The built environment of the city is also full of contrasts, not just in terms of styles, but mostly for the coexistence of modern and high-tech systems of communication and transport with obsolete, inefficient ones, and with areas devoid of all infrastructure. Given this complex and contradictory context, how can questions of identity and memory be articulated?

These questions are even more problematic considering the pace of São Paulo's transformation. In 1935, Claude Lévi-Strauss³ had already defined São Paulo as a city condemned to be always new, without a temporal dimension, with no vestiges, without maturity. The most dramatic

change, however, occurred between the late 1930s and the early 1970s. In a mere 30 years the city changed beyond recognition. As Lima Toledo⁴ said:

‘The speed of expansion is such that it obliterates within one’s life-span the environment of the previous generation: youngsters do not know the city where, when young, the adults lived. Thus, memories outlast the built scenery, and they find no support and reinforcement there.’

Looking at the chaotic cityscape of São Paulo (Fig. 1) a series of questions arise. How can the built environment of a modern metropolis that is in a constant, autophagic process of change provide some kind of support for its inhabitants’ memory and sense of identity? And, if identity exists, where does it lie? Can inhabitants have a symbolic link with the city in the absence of architectural and spatial references? And, finally, how can research on São Paulo be relevant for a non-Brazilian audience?

There is an ongoing discussion on globalization, the ways it affects the built environment of the city, and the meaning of these changes. However, the debate tends to focus on cities of developed and newly developed countries.

There are three points to make:

São Paulo has for a long time had those features that seem to catch the attention of many Western scholars writing about the changes affecting First World cities, such as ethnic multiplicity, sharp social contrasts, informal activities and a combination of a first-rate

infrastructure with an obsolete one. The case of São Paulo might provide some useful elements for the current debate.

The complex dynamics of our ‘global’ world affect cities in all countries, regardless of their hierarchic position in the world. To keep articulating the discussion on cities maintaining different geo-economic contexts is to deny the very essence of globalization: that is, that all countries – and cities – are interrelated by the logic of capitalism (what happens here affects/depends upon what happens there).

The division between First World and Third World is an ideological and reactionary one. It is arguable that the class divide is more significant than the national one. When considering other parameters such as racial tensions and social injustice, Brazilian cities and US ones might present a much less clear-cut division. To keep reproducing this division in academic discussion does have political implications.

The Borough Bexiga

Given the impossibility of dealing with São Paulo as a whole, I focused on a specific borough, the Bexiga, which is one of a series of working-class boroughs that grew around São Paulo’s historical centre at the turn of the century.

The choice was dictated for practical as well as theoretical reasons. Here, a gentler pace of urban change has maintained part of the original structure of the borough and, to a certain extent, the original population. As a result, it is still possible to find ‘readable’ marks of the history of the city, as well as architectural signs of the culture of its



Figure 1.
View of São Paulo.

inhabitants. Moreover, precisely because it is one of the few areas that resisted the dramatic changes that transformed the rest of the city beyond recognition, the Bexiga functions as a locus for the collective memory of São Paulo. There has been a great deal of activity aimed at preserving and rescuing its history, records and data, which are almost non-existent for other boroughs.

It might appear problematic that with the intention of studying the way in which identity and memory can exist in a highly dynamic city, I considered an area affected by the least change. However, the borough has an interesting and contradictory position in relation to the metropolis, being at once a locus of resistance for a cultural community (compatible with Rossi's approach) and an active component of the metropolitan dynamism. The observation of this complex interrelationship brought to the forefront unexpected aspects for the discussion of identity and memory in a modern metropolis.

The identity of a borough

Founded in 1554, São Paulo emerged as an important urban centre towards the end of the eighteenth century thanks to the export of coffee produced in the region. The centre of the town, the so-called 'Historical Triangle', developed as a financial and administrative centre for the coffee economy. Until the end of the century it was surrounded by a number of *chacaras*, large estates that were developed and urbanized in successive phases. The Bexiga was one such estate, effectively neighbouring the Historical Triangle but preserving as late as 1870 areas of wilderness where,

according to Afonso de Freitas (a contemporary witness), 'game and fugitive slaves could be hunted'! The coffee economy had brought a large number of slaves of African origin from the North of Brazil to the region of São Paulo. Despite the fact that a slave market existed at one end of the Bexiga – today called Largo da Memoria – it appears that the Bexiga was chosen as a possible refuge. According to Raquel Rolnik,⁵ before the official end of slavery in 1888, in the Bexiga there was a *quilombo*, a delimited area that worked as a sort of liberated territory, a community protecting its inhabitants. Numerous *quilombos* existed throughout the centre and the north of Brazil up until the end of slavery, but in particular during the eighteenth century. These were highly organized and autonomous communities, which in many cases had their own armies. Military confrontations took place with the imperial army on several occasions. In one instance at least, that of Palmares in the region of Alagoas, the *quilombo* resisted the attacks of the army for many years, but was eventually defeated and its population exterminated.

When slave labour was supplemented by wage-labour provided by recent European immigration, some immigrants, realizing the opportunities offered by a rapidly growing city, decided to settle in São Paulo. The Bexiga was, then, one of the boroughs where immigrants – mainly Italians – settled, in this case alongside blacks. Thus from the beginning the borough was host to a marginal and modest population, in this sense representing the other side of the coin of Brazilian development.

Marks of ethnic heterogeneity can be found on various levels. A crucial cultural reference for the Bexiga is the Church of Achiropita (1918), built by Italians from Calabria. The church is located in the rua 13 de Maio, a street dear to the black population because it celebrates the day when slavery was abolished. The church's importance goes beyond its religious role; it is in the name of the Achiropita that an annual festival is organized in which gastronomy is the reason for a large gathering. The 'Vai-Vai' school of samba was created by a group of football players in the 1930s, and for many years was exclusively formed by blacks. Starting off as a simple *cordão* – a large informal group of people parading through the streets during carnival – the Vai-Vai became an important part of the borough's community life, and it is now an official school of samba open to the white population. More recently, a *terreiro* (territory of spiritualism) for religious practices of African origins – such as Candomblé – opened, just in front of Bexiga's oldest and most famous bakery and food shops, the São Domingos. The bakery, like many other Italian shops and restaurants of the borough, signals its ethnic character even through the choice of colours displayed on the shop sign (Fig. 2). Nearby, another building shows a less communicative approach: the advertisement is written exclusively in Korean (apart from the 'no parking' message written in Portuguese) (Fig. 3). A recently opened Amazonian restaurant displays a menu in which of the many special dishes advertised on the board outside, only four belong to the Portuguese vocabulary; the others are Amazonian-Indian terms. This is an example of newly arrived migrants from

the north of Brazil. Together with restaurants, numerous theatres of different character (popular/traditional and fringe) have served the Bohemian side of the Bexiga from the late 1950s.

Heterogeneous in terms of ethnicity, the Bexiga is also heterogeneous in terms of occupation. Unlike the other popular boroughs located around the city centre, such as Barra Funda, Brás and Mooca, the Bexiga did not grow next to – and as a function of – factories and train stations. Its population was – and still is – employed in different activities, ranging from employees in the city centres, to artisans, small traders and domestic helpers in the nearby av. Paulista, a middle-class area. This heterogeneity in terms of occupation is one of the elements that helped the borough to survive the economic changes of the city of São Paulo.

We shall now see how and to what extent the built environment of the borough reveals this complex identity.

Built environment and cultural identity

The analysis of the relationship between a social group and its built environment is a complex one and has to be broken down at different levels. Moreover, at least in two respects one has to be cautious.

To begin with, it is important to remember that in a capitalist society 'space' is not there for free use, but is a commodity and, as such, works within the logic of the market economy. The constraints imposed by the commodity character of space have therefore to be considered when investigating the relationship between the built environment and the culture of its population. This implies the consid-

Figure 2.
Shop signs.



Figure 3.
Shop sign.



eration not only of what is built with conscious intent, but also the way in which space is used for activities other than those for which it was originally shaped. In the case of a borough that is the locus of a less well-off population and is therefore neglected by public attention, it is also important to consider what is absent. Conversely, there might be important cultural aspects of the Bexiga inhabitants that do not have a built representation.

In addition, my observations interact with a whole recent literature produced about the cultural identity of the Bexiga. I have to deal with the ideological discourse organized around the Bexiga, which seems to have been stimulated by a debate initiated in the 1980s, with the elaboration of a

series of projects aiming at halting the process of deterioration of the borough. As Francisco Scarlato⁶ pointed out in his thesis *The real and the imaginary in the Bexiga: autophagism and urban renewal in the borough*, the most popular

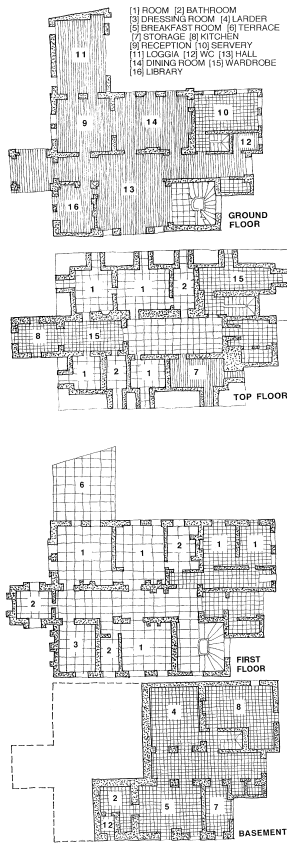
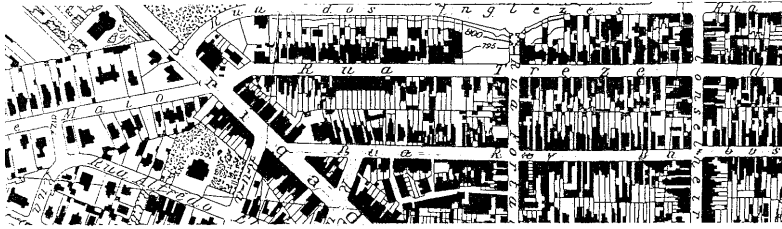


Figure 4.
Plans – late nineteenth
century bourgeois house
(after Raquel Rolnick).

Figure 5.
Partial map of the
Bexiga.



historical reconstruction of the Bexiga is the one that overemphasizes the ethnic characteristic of the built environment. Thus a certain degree of caution is required here, in order not to fall into easy 'folklorizations'.

House typology

Let us consider the main original housing types built between approximately 1890 and 1910.

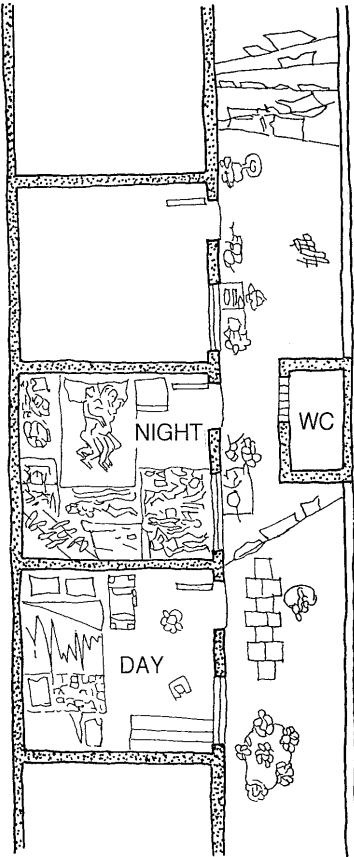
The richer High Bexiga, closer to the av. Paulista, consists of detached houses in vaguely European taste surrounded by gardens. The interior of such a house is divided into different rooms with specific functions, respecting the norms of what was considered an appropriate lifestyle for a bourgeois family, hence the separation between social and private space, adults and children, owners and servants (Fig. 4).

Rather different is the configuration of the Low Bexiga. Here, streets are lined with terraced houses with narrow facades (5 m) while the houses develop backwards (up to 50 m). This peculiar kind of settlement is explained in the first instance by the way in which the original *chacara* (landed estate) was divided for speculative development

(Fig. 5). As the 1879 original advertisement states, this was sold as 'land that anybody can afford!'. Prices were low, but most importantly the owners were willing to sell even small amounts of land to meet the economic possibility of the buyer. Since the street system pre-dated the sale, the way to reduce the purchasing cost was to buy a narrow strip of land with a deep back garden. In this way, modest immigrants and small speculators could afford to buy small bits of land with the intention of building either their own family home, or property to let.

In the Low Bexiga there are two main types of house. The *casarões* are large houses divided into many rooms, each usually housing a whole family or several individuals. Often the rooms are in a single line, one next to the other, opening up onto a long corridor. People living there share the services (bathroom, kitchen and laundry space) located in an open area. This is the most common form of *cor-tiço*, or slum, characterized by the small space used for different functions (Fig. 6). The *casarão* mainly housed the black population of the Bexiga.

The second type of house – *casa com fundos* – has a living room, two additional rooms and a



separate kitchen within the perimeter of the main house. At the back is a bathroom which is shared by other people living in separate additional rooms (Fig. 7). Frequently these rooms were built as a later addition, either to house members of the same family (after marriages, for example) or to provide rent through letting. According to a local resident, born there in 1905, subletting was the most common practice adopted by the Bexiga's residents in order to pay the rent or to supplement their income. In his experience as many as eight families could share the same house.

As we have seen, to live in houses accommodating several families was not a free choice but an economic necessity. And yet, in all oral accounts recorded *ex post facto* life in *cortiços* is described in positive and almost nostalgic terms. How does this come about?

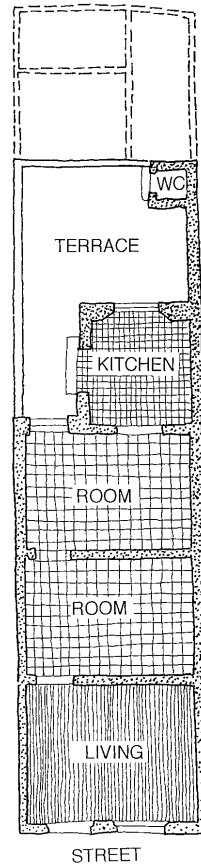
As far as the Italian community is concerned, one has to recognize that within the limits imposed by economic necessity, this immigrant population used the space to re-create and maintain cultural links. In particular, the custom of hosting members of the same family in the annexed rooms, or letting them out to new immigrants from the same region or town, testifies to a conscious use of the space that has an important cultural impact. The numerous cultural activities that used to – and sometimes still do – animate the borough could not exist without the presence of close links between the members of the group. Religious and seasonal festivals, football teams, traditional pastimes and commercial activities such as restaurants and *padarias* (bakery/delicatessen shops) are some examples of activities that so deeply marked

Figure 6.
Plan – typical *casarão*
(drawing after Raquel Rolnik).

Figure 7.
Plan – typical *casa com fundos* (drawing after Raquel Rolnik).

the specificity of the borough. The Capuano restaurant, for example, started as a canteen for the family and a few friends, but it became a focal point for the community as a whole and later became a famous institution whose 'cultural' impact spread beyond the limits of the borough, attracting a large clientele. Many commercial enterprises went through the same process as the Capuano, having in this way an impact on the formation of the culture of São Paulo as a whole, disseminating Italian customs. Terms such as 'community' and 'solidarity' recur again and again in all accounts. It is important then to recognize this *modus vivendi* as being a deliberate strategy of a modest and partially marginalized community in organizing its territory within a hostile urban network.

In the case of the black population things are more complex. The harder dwelling conditions make it difficult to treat these spaces as loci of cultural resistance. However, for Rolnik⁷ some of the *cortiços* in the Bexiga bear cultural marks. She is currently investigating reminiscences concerning the spatial organization of *terreiros* of African spiritualism (alive and extremely widespread in Brazil) and of *quilombos*. As I mentioned earlier, one such *quilombo* was located in the Bexiga, precisely in the part of the borough – called Saracura – that remained inhabited by the black population. Rolnik considers that the spatial organization of the semi-rural Saracura *quilombo* is similar to that of semi-rural African dwellings (in Benin, place of origin of many blacks brought to Brazil). I was unable to find further evidence of this, and the lack of studies and documents relating to the



history, habits and traditions of the black population in São Paulo is a significant 'absence'. One of the reasons for the existence of a substantial amount of material on the Bexiga is the active interest of São Paulo's Italian community, which over the decades has become a very powerful social group in the city. This is not the case for the black population.

It is clear that a different organization of space signifies different cultural habits. Whereas the housing typology of richer areas implied isolating the family from the street and the individuals within the family, the typical Bexiga housing scheme implied a strong communal life. This solidarity has a value that should not be underestimated. Here, Richard Morse's⁸ observation is shared by most commentators (including the inhabitants themselves):

'Unlike anonymous slums and tenements of other cities, São Paulo's *cortiços* – with their grouping of rooms on the same floor and around a central yard with common services – show a substantial social solidarity. Despite fights and gossips, people born and growing up in a *cortiço* of, say, two hundred dwellers, develop sociability and habits of mutual help and shared experience.'

Viewed from 'the other side', the solidarity existing in the *cortiço* appeared as a threat. Hence the numerous statements either by public institutions or by private citizens on the necessity of dealing with these places, and with the close social life and 'promiscuity' that were perceived as threatening habits.

Public space

The second element to consider is the public space: that is, the street.

As the borough lacked squares or green areas, the street was the only space that it offered to the inhabitants for leisure, religious and sport activities. Additionally, deprived of space within their dwellings, the inhabitants treated the street as an extension of the house, gathering together there. The problem here is that samba, football games or the gathering around table and chairs brought outside on the pavement do not leave permanent marks on the built space. The Vai-Vai school of samba, for example, lived for many decades without having a space of its own in which to gather. Yet, certain elements are apparent. According to architectural historian Nestor Goulart, the houses in the Bexiga mark significant changes in the way the house relates to the public space. The typical house in the Bexiga is not at street level – following a traditional model – but is situated half a floor above. At this height the window allowed the dweller to remain in touch with life outside the walls while avoiding too close a contact from the exterior. And because the houses were built along the street line, with no spatial gap between the two, to be at the window meant to be almost directly on the street. Many houses were also the working place of the numerous artisans living in the Bexiga. Unlike factory workers, the artisans in their home/workshop were constantly in contact with the life of the borough.

That the public space is an extension of the interior space is even more evident in the *vilas*, where small terraced houses are located around a

Figure 8.
Example of vilas.



cul-de-sac (Fig. 8). The proximity of public and private space is an important feature of the Bexiga, acknowledged in all accounts.

Facades

An important way of affirming one's cultural identity was through the decoration of the facades. Numerous are the shops whose facades are painted with the colours of national flags. This habit, which originally served both to signal ethnic identity and to catch the attention of the passer-by, has later become a common feature of São Paulo's built

environment (Fig. 9). Even today many traders paint not only the whole facade but even the pavement in front of the property with vivid colours, as a way of advertising their trade or presence.

Social relations

Finally, a whole set of socially and culturally relevant 'moments' have no built or architectural sign. What happens at the corner of a street, around the entrance of a bar or on the steps leading up to a house might leave only one kind of mark, that which remains solely on the actual protagonists,



without inscribing a frozen sign on the environment to be captured by the outside researcher. In the accounts of the inhabitants, the memory of cultural and social life of the Bexiga before the 1950s seems to be very closely related to corners and streets that seem of very little significance to a *flâneur* of today. Their specificity lies in the social relations that built up in those places, not in their intrinsic space.

The features discussed above allow the Bexiga to be considered as a 'liberated zone', similar to the way in which Castells⁹ describes the areas of San Francisco predominantly inhabited by a gay population. Opposing the concept of 'ghetto' used by the school of Chicago, Castells considers that this kind of occupation of the urban space, beyond possible economic constraints, represents a deliberate choice of the group, living together as a cultural community. In this sense, within a growing metropolis, the Bexiga functions as a territory in which the dynamics of both exclusion and resistance are at work.

What happened to the Bexiga?

Today the borough is a different space. The relationships between its inhabitants have changed substantially. The street is no longer a public living room in which to gather in the evenings, to sit on chairs and play games. Rather, it is the domain of cars and 'outsiders', visitors attracted by well-established restaurants (whose owners have changed many times by now) and fringe theatres little related to the local population. Many of the old *casarões* have been demolished to make room for high buildings. Those that remain are in decay. Facades have been altered by billboards signalling new commercial use of the houses.

Many of the original inhabitants have moved away and new 'foreigners' (Nordestinos, i.e. migrants from the north of Brazil) have arrived. The annual festival of the Achiropita, sponsored now by the municipality and commercial enterprises (such as restaurants and the food industry) is a tourist attraction. Its Italian character, once a

Figure 9.
Decorated front.

reflection of its very protagonists, today has to be created through the extensive use of symbols such as flags. The Vai-Vai school of samba has also changed. Many of its members have moved to the outskirts, and now 70% of its members are outsiders. Busy streets no longer provide free space for the school to practise dances and songs, and this might lead to departure of the school from the borough. What happened? The changes are due to the rapid growth of the metropolis, which has had a tremendous impact on the built environment of the Bexiga, and to the inhabitants' contrasting reaction to it.

The physical expansion of the metropolis affected the Bexiga twice. The first time was in the early 1940s with the partial implementation of the 'Plano de Avenidas' elaborated by Prestes Maia. According to this Plan, a number of major avenues were built, two of which, the Av. 9 de Julho and the Av. 23 de Maio, fixed the borders of the Bexiga (Plan 'Y'). The existence of major avenues facilitated the process of verticalization of São Paulo. All the areas near the centre were subject to pressure in terms of both population and land speculators. The process of demolition of old houses and the presence of buildings having a variety of functions in what had previously been mainly a residential area marked the beginning of the end by altering local habits and social relationships.

However, it was a later, second plan that had a devastating consequence for the borough. The political and economic choices of Brazil's rulers provoked a major new surge in the growth of São Paulo in the 1950s and 1960s. Industrial production increased and diversified. Of particular

importance was the car industry established in the outskirts of São Paulo in 1956. The increase in the number of cars and the physical expansion of the city required new high-speed avenues, which in many cases cut through central working-class areas such as the Bexiga. Scarlato¹⁰ defined 1968 as a watershed between the old and the new Bexiga. The *via expressa* (Radial Leste) split the borough into two, breaking in this way the unity of the borough and that of its inhabitants (Fig. 10). The rua Barbosa was doubled, becoming another urban wall. Car parks built under the *via expressa* only helped to transform what previously worked as a living room into a hostile territory. For several years the borough was transformed into a building site. Many blocks were demolished, and hundreds of people had to leave, taking with them their activities, culture and social links. The high-speed road designed to respond to the metropolis' needs ended up by altering the Bexiga transport system, and the flow of cars increased both in number and velocity. The impact of the growing metropolis and building speculation upon the borough is not dissimilar from that experienced in the Bronx (New York) in the 1950s and 1960s. Marshall Berman's description of the transformation of the Bronx caused by the Cross-Bronx Expressway fits perfectly the experience of the Bexiga.¹¹

The inhabitants' reaction to these interventions was mixed. Before the plan was implemented, people were positive about it, because there was an expectation that the borough might be gentrified through its closer link with metropolitan life. As the results proved to be different, people reacted differently. Some moved out and accepted



capitalist logic: knowing that the land value is higher than that of the actual building, owners no longer invest in it, waiting for the right moment to sell. Meanwhile, they let the property as a slum. However, the origin of the urban development of the Bexiga has an unexpected role of resistance. The divisions and subdivisions of the houses among different members of the family prevented the massive intervention of speculators. On many occasions, they had to renounce buying properties because it was impossible to find, or persuade to complete the transaction, all the members of large families who inherited the properties.

Other inhabitants fight back by exploiting the invasion of the metropolis. Because of its proximity to the elite area, the Bexiga is used by the elite for both services and leisure (restaurants, bars, theatres etc.). It came to signify a sort of exotic 'other', an identity that Armandinho, a local resident and keeper of the local museum, is happy to support by overtly inventing traditions. In the annual 'washing of the steps', black ladies dressed

up as Bahianas (i.e. from the Brazilian Northern region Bahia, with strong black culture) enact an invented ritual. Numerous initiatives and projects aimed at rescuing the Bexiga have been – and still are – put forward, causing worries among the poorer population, who fear that urban renewal will once again result in higher rents and expulsion. The game is still open.

Conclusions

Within the existence of economic and social constraints the inhabitants of the Bexiga have been able to create a liberated territory where community life and a sense of identity were established through the use of typology, decoration of facades and multiple use of public space. The same can be said for the numerous working-class boroughs built around the city centre with a strong ethnic composition – Japanese, Jewish, Korean, Syrio-Lebanese. They can be seen as territories of cultural resistance: the ethnic groups did not act as excluded and segregated ones, but moved and worked (and still do) in the city as a whole, disseminating their customs and culture.

The atypicality of the Bexiga lies in the fact that it has survived in terms both of space and of memory, given its location between the historical centre and the rich area of the city. The location allows for the heterogeneity of employment, which was not predominantly linked to industrial activities. It also allows the borough to play the role of the exotic 'other', an identity that the inhabitants actively promote. In this way, the memory – partly 'original' and partly re-created – of the borough is preserved.

Figure 10. Highway cutting the Bexiga.

Figure 11. Nomadism – street sellers.



Figure 12. Nomadism – street sellers.



Thus, although in this study the Bexiga has been treated as a self-contained borough, almost separate from the metropolis, with its ethnic and cultural features it is an active – and ever-changing – component of it. The built environment of the Bexiga can be seen as being at the same time the scenery, the instrument and the result of continuous tensions between domination and resistance in the city.

There are social links and aspects of cultural identity that took place there but have no built form. Today this question acquires special relevance. Among the consequences of current processes of globalization and economic structural readjustment are the expansion of the informal economic sector and the displacement of a large number of people seeking jobs in other countries. All metropolises, whether located in developed or

in less developed countries, are affected by these changes and by the quantity of people that occupy an informal position in the city in terms of work, residence and official existence. Just as happens in other cities, the millions of people that live in precarious accommodation in São Paulo – *cortiços* and *favelas* – are by no means marginal in relation to the metropolis. Many commute daily for their activities. Some are employed and many have informal activities that, however precarious, play a role in the daily life of the metropolis. Because of the nature of their informal activities and the precariousness of their accommodation, large numbers of people ‘move’ around in the city space, in spaces ‘in between’ architecture. Their ‘transparency’ in official, legal and spatial terms prevents them from being fully considered citizens, with the right to vote, to the national health system, education etc. And yet, they are very much part of São Paulo, its life and its identity. When considering São Paulo one wonders whether, despite Rossi’s powerful arguments, one should acknowledge the limits of architecture and the built environment in bearing significant marks of the metropolitan experience.

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6. Francisco Scarlato, ‘O real e o imaginario no Bexiga: autophagia e renovação urbana no Bairro’ (unpublished PhD dissertation, São Paulo, 1988).
7. Figs 6 and 7 are taken from Raquel Rolnik, ‘De Como São Paulo Virou a capital do Capital’, in *Habitação Operaria em São Paulo na Primeira Republica (1900–1930)* (1981).
7. Raquel Rolnik, ‘Territorios Negros em São Paulo’, *Folha de São Paulo*, 28 September 1986.
8. Richard Morse, *Formação Historica de São Paolo* (São Paulo Edusp, 1970), p. 298.
9. Manuel Castells, *The City and the Grassroots* (London, Edward Arnold, 1983), p. 139.
10. Scarlato, ‘O real e o imaginario no Bexiga’.
11. Marshall Berman, *All that is Solid Melts into Air the experience of modernity* (New York, Simon and Schuster, 1982).

Hearth and cloth: dwelling practice and production in Eastern Tibet

Suzanne Ewing

In the context of rapid contemporary shifts of migration, modernisation, urbanisation and Sinification in Eastern Tibet, a significant impact on the inhabited environment of the 'everyday' is evident, manifest in the use of new materials, new work and building practices, the impact of new neighbours, and the appropriation of new media. Within a critique of attitudes to the primitive (vernacular) and modern, practices related to dwelling in terms of the material realisation of the house and tents are shown to be related. A sophistication of *sBra-gur*, the black tent of the nomadic pastoralist, is revealed, with symbolic ordering and spatial relationships related to Tibetan dwelling houses. Through examining the spatial role and production of the Semperian archetypes of 'hearth' and 'cloth' in the tent in particular, it is shown that settlement and fabrication are interdependent. It is argued that understanding patterns of 'everyday' dwelling practice should be the basis for potential judgements concerning continuity and future adaptation and change. The origin of this work was architectural consultation on the adaptation of traditional Tibetan houses, an approach in which inherent dilemmas soon become evident – the potential to participate in shifting balances of making, inhabiting, developing, communicating.

Introduction

'... the domestic hearth of the nomads with its primitive protective roof structure remained at all times the sacred symbol of civilisation'.¹

Physical manifestation of nomadic life is evident in valleys in Eastern Tibet, where groups of earth or clay built stoves are left relatively intact until nomads return in a following season. The powerful nakedness of these domestic remainders, the warm, foundational, hand moulded, centrality of the hearth critical to actual dwelling is starkly exposed in the enormity of the landscape. Without the protection of the timber poles and yak hair tent structures

or the communities of yaks, horses, people which this supports, the hearths come to be perceived as cold and scattered, completely dominated by the scale and potential harshness of the surroundings. They contain the possibility of ruin and abandonment beyond the next season in an increasingly rapidly changing social, political and economic situation. With a cycle of reinhabitation of these particular places assumed, the small clay and earth structures are essential to future settlement and embody a process of renewal and continuity of practice (Fig. 1).

Early twentieth century and modernist preoccupations with the 'primitive' were based on the

Figure 1. Interior of *sBra-gur*, black tent in Luoxu Nature Reserve, near Bengda Xian, in north west Sichuan, July 1999. Making tsampa. (Photograph by author.)



necessity for an articulated difference from what was 'new' and forward looking to be retained and controlled in order to progress modernism and modernisation.² Specific examples of the primitive or primitivism as an idea being used as an inspiration in relation to modernity³ can be seen to link the essential qualities of simplicity, lack of pretension, clean lines and form, with aspirations of potential 'timelessness'⁴ and the implication that this is a fundamental source for understanding inhabitation and even civilisation. The cyclical inevitability of leaving the hearth physically, for instance in the case of the Kham⁵ nomads, recollects the temporality of

life, the inevitability of leaving the world physically. This understanding of temporality is underlined in the idea of remnants, the remainder of something that was whole, and echoed physically in the decaying and renewal of material.

Gottfried Semper's preoccupation with the dwelling in *The Four Elements of Architecture*⁶ in the nineteenth century reacted to a hierarchical model of art history by adapting a comparative morphology in the context of ethnographic and anthropological development and the natural history of eighteenth century biologists.⁷ His attempt to integrate form and methods of making was explored in a proposed ordering of human artefacts. The hearth, the 'moral' foundation of settlement, related to the process of moulding and to earth or clay. *'To the hearth belonged the ceramic product hardened in fire'*.⁸ Two primary archetypes he identifies are hearth, *Urherd*, and cloth, *Urtuch* – the first mark of settlement and the first fabrication. 'Domestic' in Semper's vocabulary therefore connotes moral foundation, moulding and an essential element of the earth, by implication worthy of protection from the outside, nature, albeit by simple available means. Semper promotes the universality of these implicit qualities as emblematic of civilisation itself. The simple material and practical focus of the nomadic home is depicted as having qualities of timelessness, of permanence and of sophistication.

Dualist conceptions of tradition contrasted with modernity and past separated from present marginalise traditional continuity and practices as an appropriate way forward or a field of study relevant to the present and future production of built form, architecture. However, recent preoccupation with

the ordinary or everyday rather than the extraordinary in architecture⁹ can be seen as an attempt to reassess value. Any contemporary study of 'traditional building', which includes an aspect of continuing practice, can operate within a number of frameworks,¹⁰ and an underlying polarisation or duality can be seen in debates concerning localisation and globalisation. In revisiting nineteenth century archetypal notions related to dwelling and interest in ethnography, combined with contemporary spatial approaches and analysis, an attempt is made in this paper to shift from dualistic vernacular/modern, preservation/progress and pure/polluted simplifications, to enable more differentiated discussion of dwelling practice and production based on material from recent fieldwork and study in part of eastern Tibet¹¹ (Fig. 2).

The first part of this paper introduces existing dwelling practice in Eastern Tibet in terms of the material realisation of house and tent, the hearth in the landscape. Relationships of orientation, inhabitation and spatial structure have commonality in both the house and the tent. Changes of nomadic dwelling patterns highlight some of the key issues relating to the impact of the current context on dwelling practices and production. The second part of the paper examines the spatial role and production of the Semperian archetypes of *hearth* and *cloth* in the tent in particular in terms of interior spatial relationships and symbolic ordering and some aspects of form and methods of making. Relevant cycles of renewal are examined in relation to temporality and decay. Settlement and fabrication are shown to be interrelated in this 'everyday' situation.



Figure 2. Tibetan street, Dengke, in north-west Sichuan, July 1999. Traditional 2–3 storey dwelling house with timber clad living areas within rammed earth walled enclosure. (Photograph by author.)

The hearth in the land(scape): orientation, inhabitation, and spatial structure

There is a danger of romanticisation of this context, which continues to fascinate. Tibet as a place, which embodies purity and mystery, has been disseminated through a range of literature and film.¹² Tales surround *Shangri-La*, the place of the unknown, a mythic destination, of majestic scenery, of discovery. It has been described as an 'encapsulated

environment'.¹³ This sense in western consciousness of the untouched environment is also related to perceptions of culture – of spiritual purity, traditional distinctive lifestyles, in fact all that the polluted, urbanised, materialistic homogenous west is not – a return to dualistic models. The nomad(ic) has been shown to be associated with origins, foundation, as being outwith mainstream cycles of global progress, and therefore by connotation, can be seen to be uncorrupted, untouched.¹⁴

Tibetan historian, Stein, notes that the mythology evident in the spatial structure of the tent contains nothing but 'allusions to the architecture of the dwelling'.

And indeed, everyone knows the magnificent, daring stone buildings typical of Tibet – palaces, castles, temples and even private houses. Such technology is not the work of nomads. The prototypes of this architecture are reported in the land of Fu and the Country of Women, in eastern Tibet in the sixth century; nine-storied houses and defence towers some 75 to 90 feet in height. These towers, which are often octagonal, are still characteristic of the Ch'iang and other districts in Kham, in the modern period.¹⁵

It is, however, argued here that the tent is more than a temporary and less sophisticated version of the permanent Tibetan house. In fact it embodies more clearly some essential philosophies and relationships that inform dwelling practice and production in this context. It can also be defined as an 'elementary building'.¹⁶ Stein's equating here of sophistication of technology, 'magnificent, daring', with permanent settlement, '*not the work of nomads*', demon-

strates a value differentiation between permanent and impermanent, dwelling product and dwelling practice, embedded in already-discussed modernist discourses related to tradition.

The stone and/or earth built buildings of Eastern Tibet are traditionally massive walled, striking and many exude a surprising sense of decorative and construction quality and topographic complexity. The building of a dwelling house has historically enabled continuity of inter-dependent relationships between family and community, the realms of interior and exterior, and in broader terms the interdependency of the earth and the gods. Tibetan dwelling is a tradition and practice of significance to those inhabiting it as the framework for and embodiment of specific social and ritual culture. As in other parts of the Himalayas, the Tibetan dwelling house and its cycles of construction, inhabitation and renewal are intricately bound with phases and particular aspects of life of the inhabitants as understood from an underlying Buddhist framework also linked in this region with Tibetan Bon and local folk beliefs.¹⁷ The life cycle of a dwelling house relates to a family's life cycle as well as to key family relationships and arrangements. Both sedentary and nomadic dwelling patterns maximise use of space for interaction and contain no specifically allocated individual space.

The nomadic tent also enables a continuity of social, spatial and spiritual interdependent relationships, accepting and embodying dialogue with temporality and decay, an expectancy of renewal. Positions for nomadic camps generally become well established over time. Constrained by the practicalities of life in a hostile environment, encamp-

ments tend to be in sheltered locations on the leeward side of hills with good grazing nearby (Fig. 3). The key orientation of tent or house can be in relation to a mountain behind visible on entry to the dwelling, relating to understood cosmic importance of the sacred nature of mountains as illustrated in many *thankas* and wall decorations. Entrance doors to both tents and Buddhist temples often face eastwards, the rising morning sun represents 'the beginning' and this orientation allows the first rays of light entering in the morning to reach the altar at the opposite end of the central axis of the tent, or temple.¹⁸

Nomadic dwelling and change

The *sBra-gur* has become part of Tibetan identity and its inhabitants are known as 'black Tibetans' or 'black shelter people', *sBra-nag-ba*.¹⁹ There is little historical evidence regarding its origins but it was most likely to have been introduced by merchants or nomads travelling from the west. The nomadic population in this area can be traced back several centuries to the Ch'iang tribes who roamed central Asia, and the Chinese in the 8–10th centuries noted the existence of nomadic peoples in Tibet.²⁰ Nomads live from herding yak, goats and sheep across the high level plateaus predominantly of western Tibet, following traditional practices of animal husbandry and transhumant pastoralism.

Nomadic dwelling patterns and mobility allow for minimal touching and therefore minimal visible corruption of (or building on) the land. The relative sparseness of the nomadic population and relative inaccessibility of the region has enabled the



Figure 3. Black tent in landscape. (Photograph by author.)

nomadic pastoralist's lifestyle to remain relatively unchanged. Discourses in relation to sustainability and 'traditional' practices are being revisited in this context. Influential texts such as Schumacher's,²¹ which was heavily influenced by Buddhist philosophy and practice in relation to the land, show some traditional practices to be almost antithetical to the maximum production and consumption equations of the West, now being appropriated by China's modern project.²² Difficulties of accessibility to more remote rural areas have hindered comprehensive study of Eastern Tibetan domestic and nomadic dwellings,²³ and perceptions of the vernacular and in particular the impermanent as being backward, not able to be accepted into an urbanised context without some degree of progressive changes are still prevalent attitudes. The portrayal of Tibetans as 'backward', poverty-stricken people dependent on subsidies from Beijing is a highly subjective political view that does not reflect a more complex reality'.²⁴

Nomadic movements have a summer/winter pattern. Camps tend to move in September for a longer winter residency of 4–5 months at lower, more sheltered altitudes. Traditionally nomads

stayed at higher altitudes all winter despite atrocious weather conditions in harsh snowy winters,²⁵ but more recently the majority descend to much more sheltered regions and even take up winter lodgings in semi-permanent or permanent buildings. Winter quarters for those who choose not to camp can be covered pits dug from the ground, or shelters of mud or clay brick or with dung and wattle walls. Trading trips to nearby towns and villages, and now cities, are undertaken in the winter. These are journeys of up to thirty days to trade cattle and butter, cheese and felt for goods such as sewing needles, utensils, crockery, saddles, tent pegs and barley with which to make *tsampa*. With the establishment of semi-permanent bases some groups acquire harvest rights and hay is made to feed the animals throughout the winter. Traditionally most nomads sleep outside, even during the worst weather. Winter night time temperatures frequently fall well below -30° ; the old and very young sleep inside on carpets and cushions with heads away from the door, towards the altar. When nomads leave a campsite, traditionally a little *tsampa* is poured over the fire and as the family moves away they look back to observe the smouldering fire. If the smoke is rising in a vertical column they believe the earth gods are pleased and they will be endowed with good luck at their next camp. If the smoke is blown away or rises unevenly they fear bad luck and proceed with more caution. The hearths thus acquire further symbolic-religious status and are used by following groups who build their hearth over the same fireplace.

The nomads sometimes employ the services of wandering lamas or monks from nearby monas-

teries to offer prayers and sacrifices and recite scriptures. The lamas either live with the family or bring their own tent and often return to the same families year after year as they return to the same grazing grounds. These religious figures perform ceremonies and read scriptures to protect the families, the animals and tents from evil demons and to promote prosperity and health. The nomadic population in return are expected to make contributions to the monasteries. For instance, a nomad family the author met in 1999 noted that one of their sons was soon to go to join the nearby monastery. Traditionally it is a lama associated with a sedentary community who also participates in the setting out and early stages of construction of a dwelling house and likewise, contributions to the monastery of harvest or labour would be expected. Patterns of connection between nomads, sedentary farmers and monasteries are thus interdependent, physically, socially and spatially. Nomads have an interdependent if seasonal relationship with particular sedentary populations. There is a commonality between relationships of tent and house to the land where monasteries play a role in both patterns of living.

Prevailing social and political perceptions of nomadic life are of the marginal, the uncontrollable, self-serving communities at odds with nationally organised structures. 'In order to wander freely the nomad uses much more land and is therefore an inconvenience to nations that prefer to develop their land'.²⁶ This has been articulated by the Chinese Communist Party which has stated that 'in short, a nomadic life is neither beneficial to the development of animal husbandry, nor to the

prosperity of the human population'.²⁷ An attitude perhaps increasingly shared by Tibetans settling in developing urban areas who see them as shiftless, unaccountable and difficult to control. As China has stiffened its borders with neighbours like Nepal, India, and Bhutan, centuries old trading and grazing routes have been severed and nomadic tribes have moved away from the borders towards more settled areas within the Tibetan Autonomous Region.²⁸ Fencing is a controversial issue alongside the provision of houses for the settlement of nomads. 'Nomads have to tend their cattle day and night, so how can they stay in a house? . . . If you live in a tent you can take that tent with you to another area where there is good grass for your animals to eat . . .'.²⁹

Incoming Chinese migrants, changing settlement patterns and construction knowledge, patterns and perceptions of public and private, and new balances of consumption/production, mainly influence changes in sedentary dwelling patterns. It has been argued that by emphasising the most traditional aspects of minority cultures, the authorities are presenting these cultures as backward-looking and fossilised, rather than developing and dynamic. Volume 2 in 2000 of the magazine *'China's Tibet'* published images of *thangkas* depicting 'scenes of modern life in Tibet' – which incorporated an aeroplane, satellite dish, combine harvester.³⁰ Ironically, with a concurrent drive for tourism expansion in the west, the ethnicity and specific cultural qualities of minority peoples are highlighted – a tendency towards image-based conservation rather than the traditional adaptivity, mobility and continuity of the culture.

Key figures in the Tibetan exile community have described the immigration of Chinese from the east into national minority areas including the Tibetan Autonomous Region as the most serious threat to the continued survival and development of Tibetan culture and identity. Attractive 'especially beneficial land policies' including the sale of land have been proposed.³¹ Tibetans and Uighurs face increasing competition for employment and marginalisation within their own communities due to the numbers of migrants entering these regions. This also impacts on practices of making, incomers bringing knowledge, skills and aspirations related to modernisation, new materials and processes.

Conversely, with the introduction of state-organised communes, the nomadic trading system has broken down with prices in the Chinese currency set by the state. Movement has been restricted for the majority of the population as trade and pilgrimages disrupt the commune's work. The PRC has confiscated nomad weapons, previously their most highly prized possessions.³² The mobility of the nomadic population has been limited by the introduction of schools, veterinary stations, winter feed areas and economic development areas; based primarily on sedentary settlement models. A government-led project with the slogan 'fixed abodes and nomadic herding' has been noted.³³ Political control is achieved by allowing pastoralists to exploit high grazing lands whilst ensuring they return to fixed points during winter for education and veterinary care. The state has also begun to develop designated settlements, such as the one hundred mud brick houses built for herdsmen in Kuchang commune³⁴ and by the early 1970s

many herdsmen had given up their traditional seasonal movements and had built houses and animal shelters in permanent settlements.³⁵

Traditionally, family members, often male, have stayed in urban areas to trade longer and at greater distance from their families as transport links have improved dramatically. This has both had an impact on mobility patterns and on the increasing exposure to 'modern' living and culture, which have yet to be documented fully. A general trend towards proximity to urban or industrial centres would seem to be an inevitability. The state resettlement programmes are encouraging and enabling this change but in the process are oversimplifying the existing patterns of interrelationship between nomadic, sedentary and spiritual populations. Traditional ways of using land by nomads, considered by many environmentalists to be sensible adaptations to the very particular conditions of the Qinghai-Tibet plateau, are being undermined by the authorities' insistence on introducing fencing and the construction of housing.³⁶

The threat to existing nomadic patterns is seen in the designation of an area of land in northwestern Sichuan, populated by ethnic Tibetans, as a national park. A mountainous area officially designated as 'Luoxu Nature Reserve'³⁷ was the location of reportings of rare white-lipped deer in this relatively untouched area which is also near an historic east-west trading route. It is one of a number of areas in the west of the PRC which have been grouped as environmentally significant as part of a recent national 'eco-tourism' promotion, primarily related to tourism. However, in interviews conducted in July 1999, few of the local officials or

residents of the villages at the western edge of the boundary of the park were aware of this. Although documentation was constrained by time and access, nomads were observed in various locations in this park area during this summer period.

In the Emei Shan Glacier Park further south in the Province, tourist development of this 'natural attraction' has been characterised by the fast track introduction of new roads, hotels and other infrastructure which is now inevitably detracting from the essential remoteness and quality of the place. Local Tibetans are employed as guides, however there is no option for any traditional settlement in the slopes below the glacier, which are now controlled for tourist access and development. Without major new transport access to the more remote north west of the Province, it is unlikely that the Luoxu Nature Reserve will suffer such severe disruption. A relocation programme affecting any nomads in the area under the guise of environmental conservation management could however have significant implications.

The impact on the remote and relatively inaccessible Tibetan plateau and on both the nomadic population and sedentary settlements in this region is still subject to evaluation. Living 'on' or 'with' the land is a powerful image to an urbanised consciousness, which perhaps arises from a fundamental detachment or dislocation from it. In an era with increasing rhetoric promoting 'sustainability' and 'sustainable development' as a desired objective, populations with a profound understanding of this and a history of dwelling culture interconnected with a harsh environment could be reexamined. It is hoped that further assessment and

understanding of traditional patterns in relation to change and dwelling may shed light on locally beneficial adaptive change rather than cultural reduction and conformism.

Hearth

The black tent is usually square, rectangular or hexagonal in plan with a shallow pitched roof and a single door formed between the two halves of the fabric used. The tensioned structure is held up by both internal and external timber poles and pegged ropes. Walls hang from support points and may be pegged outwards, the tent can resemble a giant black spider. The roof structure covers the central hearth made of earth or clay. A slot in the roof about 60 cm wide is formed between sections of the fabric to provide ventilation and light. This opening, called the 'sky door' has important religious significance and is only covered during very poor weather with a cloth flap fixed to one side and laid over the yak hair ropes that hold either side of the slot together. One of the main columns, usually near the entrance, becomes the focus for mediation between the hearth and the beyond, indicated with a strip of cloth or offering (Fig. 4). The slender internal and external timber poles can be up to eight feet tall and work in compression whilst the external arrangement of guy ropes and spreaders woven from yak hair, tensions the fabric. These spreader ropes, which consist of 3–6 smaller chords woven into a larger rope, are an unique characteristic of the Tibetan black tent. The floors are usually earth and may be covered in woven carpets (*khaden*) and large cushions. A small table and wooden benches or logs are often placed near the

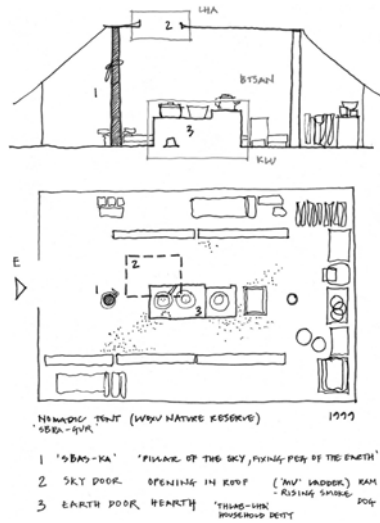


Figure 4. Interior plan and section of *sBra-gur* in Luoxu Nature Reserve, NW Sichuan, July, 1999, showing primary ordering of entrance, hearth and altar along central axis and the vertical ordering of central hearth, 'sky door' above and main pole 'fixing peg of the earth' (shaded) on the entrance side. (Drawing by author.)

hearth for receiving visitors and this is where the family meal is taken in the evening.

The spatial role of the hearth in the tent is in rooting the entrance–altar axis in the understood vertical relationship between earth and the gods. It is key to the ordering of day to day internal relationships and interactions as well as to the life cycle of the dwelling, the moving on from an encampment as *tsampa* is poured on the fire. Semper's reading of this nonspatial element was as 'a single element the public and spiritual nexus of the built domain'.³⁸

Figure 5. Interior of *sBra-gur* showing relationship between central hearth, 'sky door' above and main pole 'fixing peg of the earth' on the entrance side. (Photograph by author.)

The dwelling is understood as a microcosm of universe where the underlying tripartite nature of the universe based on Buddhist beliefs, is strongly represented in internal arrangement. The relationship between hearth and roof is imbued with significance. The 'earth door' (hearth) is usually as near as directly beneath the 'sky door' (Fig. 5). Beside the hearth is a post, tent column or rope that represents the 'pillar of the sky, fixing peg of the earth' (*sBas-ka*). Smoke from the stove rises upwards as light enters and sky and earth are connected by the imaginary *mu rope* or *ladder* connecting the sky gods (*klu*) and earth gods (*lha*). Oracles, who played a major role in the decisions of the state and individuals, are said to travel these connecting ropes and ladders as they journey between the physical world and the realm of the sky gods. Common symbolic hierarchies and similar rites aimed at banishing evil spirits and attracting auspicious influences begin to demonstrate that the internal arrangement of the tent is not merely 'an allusion to the architecture of the dwelling', but an equivalent interpretation of cultural and spatial relationships,³⁹ continuous in both a temporary shelter and a settled dwelling.

Traditional stone or earth built houses in this region can also be seen to have a 'sky door' which vertically links the ground level to the living area above to the (usually) flat roof area (Fig. 6). The ladder or stairs connect lower floors (earth) and upper floors (sky). The hearth, often a stove, is located near the top of the entrance stairs and is therefore critical to this axis. Being physically separated from the earth, this is not always made of earth, and in wealthier houses is sometimes in a separate room.



Focus for social interactions, warmth and spatial centrality is shared between this hearth area and a place for eating and receiving guests in an adjacent room in the living area marked by a freestanding timber column (Fig. 7).

The interior spatial ordering of both tent and house are configured to enable complex domestic interrelationships. The tent can be seen as an elementary building⁴⁰ with a single entrance and clearly defined boundary enclosing a 'cell'-like



Figure 6. Interior of house – ‘sky door’ in relation to stairs from ground floor. (Photograph Nic Crawley.)

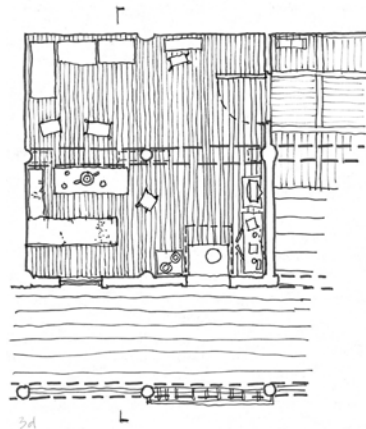


Figure 7. Interior plan and section of living area of Fong Ying’s house, Dengke. (Drawing by author.)

space. The entrance to the tent can be in either the long or short side and is formed between the two halves of fabric, the seam of which generates a central axis around which all features are arranged. Furthest away from the door is an altar where prayers and offerings are given. Around the perimeter, possessions, clothes and food supplies, including any surplus grain are stored, the more valuable items nearest the altar. Spatial ordering is reinforced

by occupation – women sit on the left-hand side of the hearth/entrance and men and guests on the right-hand side. The interior is thus defined in Hillier’s terms as synchronised, allowing different activities and meanings to interrelate. The altar furthest away from the entrance can be seen as a ‘deepest sacred space’ within this spatial and transpatial environment.

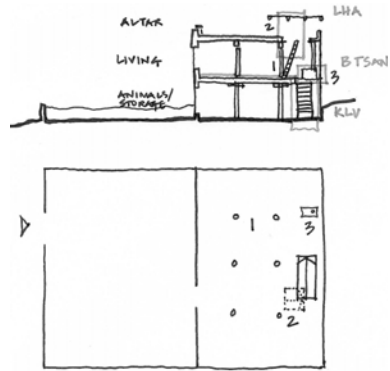
This significant single entrance and clear bound-

Figure 8. Tripartite arrangement of typical family house. (Drawing by author.)

ary is also manifest in the permanent house (Fig. 8). The entrance is not always placed directly on axis with the centre of the house. However, the location of the altar (which can become manifest as 'god room'/shrine) is usually at the furthest physical distance away. Some divisions within the main earth or stone walls of the house are defined in timber, yet visibility between areas is maintained. The lack of permeability of other parts of this boundary maintains the interiority and the spatial ordering. One of the primary effects of this relatively enclosed entrance sequence is the heightening of light internally. Within a tent, the light entering through the 'sky door' throws the hearth and central area into sharp *chiaroscuro* as the dense woven yak-hair cloth excludes and darkens the area to the perimeter. Light can also be seen to order the entry sequence in a house where the light coming from the stair stands out in the windowless dark area of the lower floor. The main living area benefits from some light entering through small windows in the walls, again, light from the link to the roof completes the vertical ordering closest to the hearth (stove) area.

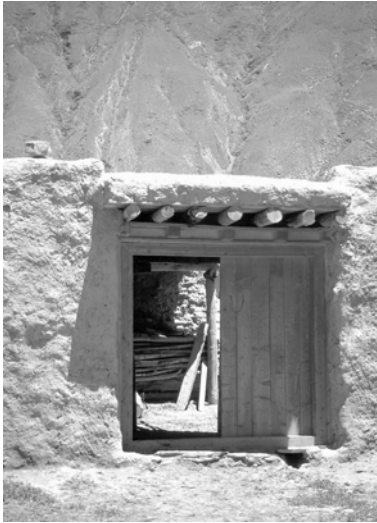
Timber doors are divided to open centrally, as in the two halves of the tent fabric entrance, and always open inwards towards the interior of the house (Fig. 9). The use of decorated cloth panels to cover internal doorways, and windows on upper levels, are evident in rural and semi-rural houses and allude also to the common idea of the significance of the threshold and clear differentiation between exterior and interior.

The case study houses in this area varied between single and three storey square, rectangular or I-



shaped buildings.⁴¹ External walls made of rammed earth or dry stone are complemented by an internal timber post and beam structure with decorative elements focused on carved and painted doorways, windows and internal timber. Variations in the region between rural and small town were found as well as those indicative of a family's wealth. Usually a lower floor or entrance courtyard serves as storage and for animals with the hearth and living area beyond or above. The importance of the boundary of the house and its unity of material can be seen to be analogous with the yak hair tent enclosure.

A general 'square' ness is common to both house and tent. Perhaps primarily pragmatic, this basic form does, however, clearly differ from the circular and triangular components of the votive *stupa* and



umn continues to bear significance as the internal marker of human space. Semper's identifiable components of hearth, earthwork, wall and roof are all readable here. However, the wall and roof tend to be perceived of as one form, either of solidity or mobility, echoing the monolith solidity of the nomadic hearth, closely related to specific household gods, perhaps even their 'dwelling place'. The hearth's critical role as vessel for warmth, food and interaction is thus reinforced by its embodied meanings.

Figure 9. Entrance to single storey dwelling house near Bengda Xian, north west Sichuan Province, July 1999. (Photograph by author.)

Cloth

The spatial role of the 'cloth' of the tent, and perhaps the canopy/eaves of the house allows a reading of the boundary of the inhabited space. The limited puncturing of this relates directly to the understood demarcation of domain, the realm of the earth and the gods. The central seam and construction of the tent literally sets out the axis, which underlies spatial ordering within. Economies of use and renewing of material are implicit. The art of dwelling and the art of construction have been differentiated,⁴² however in this context their interrelation becomes clear.

prayer wheels, embodying the infinite, endlessness. The verticality is emphasised at the high perimeter with prayer flags on tent columns/above the tent and *mani* stones and prayer flags/offerings on the perimeter corner of the roof of houses.

The structure of the tent can be seen as a harmonious balance – the compression of the main cloth tent on the earth held in tension by guy ropes and space created or mediated with a central fixing column. The house's exterior works as a massive structure, with a timber beam and post structure supporting internal floors and the roof. Thus the col-

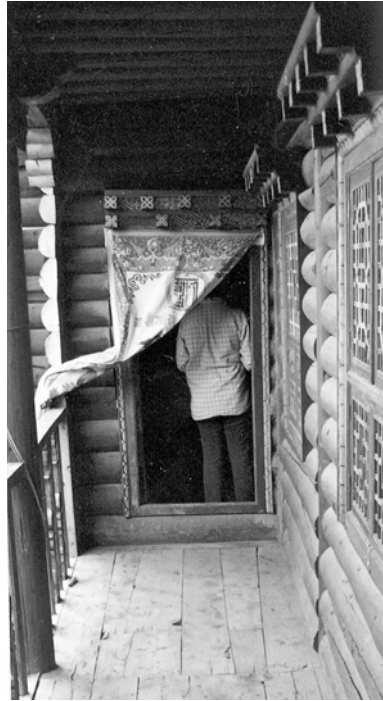
Common cycles of renewal are evident in both the tent and the house, rooted in a Buddhist/Bon philosophy. Establishing nomadic camp is a shared community responsibility. With the main tent erected, weapons are laid down and a new altar is established with an offering of food or burning juniper wood and candles. Whilst a new ash pit is dug, prayers are again offered, this time to the earth gods. Women establish the fireplace then kitchen area with fuel and food storage. The whole group gather around the low table and take an evening

Figure 10. Threshold to shrine room on upper level of Fong Ying's two storey house, Dengke, north west Sichuan, July 1999. (Photograph by author.)

meal of *tsampa* and maybe dried meat. The rituals related to leaving an encampment have been outlined above. A process of offering to earth gods also takes place during the early stages of construction of the walls of a traditional Tibetan house. Continual offerings are placed on the outermost corners of the roof of the house, over the usually generational cycle of its existence.

As families increase in size, additional smaller tents may be pitched or additional panels may be added to existing tents. Although tents may be extended to three or more sections, this is uncommon as each family owns and annually maintains its own tent, new families creating new tents. Two tents can be pitched back to back to create one large volume. A tent of 38 by 55 feet has been recorded and it is stated that the Dalai Lama's tent could hold 300 people, although the latter may well have been of a different type to that used by the nomads.⁴³

The Mongols insulate their yurts by adding up to eight layers of fabric and there is also evidence of seasonal adaptation of the *sBra-gur* other than simply folding up the sidewalls in summer to provide light and ventilation. The possessions of the family in chests and sacks to the perimeter provide a measure of insulation and internally yak dung is used to fill in gaps and spaces between. Low walls of stone, mud or dung are sometimes built inside or outside the tents to provide shelter and taller external walls up to five feet high were used in Kham to offer additional protection against bandits. The important 'cloth' tent entrance can be seen in house situations where cloth is used in doorways (Fig. 10) and implicitly in the split inward opening of outer doorways.



The longest and best quality hair for tent making covers the yak oxen's belly, and whilst Norbu shows hair being cut from a docile animal's belly, others note depilation as a more robust source, undertaken in the early spring as the weather improves.⁴⁴

Once removed, the hair is separated, sorted, rolled and spun, work done by women in the camps and men while out on horseback with the herd. As they ride they constantly rub the hair across their thigh producing tightly twisted thread. The women then weave the yarn in summer on hand-powered strap looms. The very dense fabric is pulled and pounded to produce a weather resistant material in strips 18 inches wide and 30–36 feet long. Weather resistance of the material is further increased during use as the oily soot from burning yak dung impregnates the fabric and when wet and swollen it becomes practically impenetrable.

The tent is made in two halves, fastened together using horn toggles. The joining seam relates to the spatial ordering of the interior. Each year a new strip is added to the uppermost part of each half of the tent (Fig. 11). The fabric is very tough and men sew the thick weather-tight seams. As new strips are added annually, the older weathered material passes outwards and downwards, ensuring a renewal of the whole fabric over a number of years. By the time it reaches the ground it is often degraded or rotted by the sun and hostile environment. This contrasts with the solidity of the hearth, built almost literally out of the ground and subject to different weathering in times of absence. The replacement of seams and walls acknowledge temporality and decay.

The relationship between parts and whole relates unsurprisingly to available materials, maintenance and, in the case of the tent, transport. The woven tent sections are of a size that can be carried by yak and rammed earth construction allows for repairs and remaking (Fig. 12). Made details such

as the y-forked toggles for tent ropes and the triangulating spreader ropes fixed to the main part of the tent suggest a similarity of overall emphasis to the form of the simple and decorated column heads within house constructions. The significance of the seam and its remaking prior to tent erection can be seen in relation to the eaves and window lintel details of houses where labour is most elaborate and repetitive at the outlining of the boundary between interior and exterior, inhabited dwelling and the land beyond. A close relationship can also be seen in clothing body and clothing space. Nomadic garments are usually large and heavy enough to become a location for sleeping or resting when loosened.

The impact of increasing patterns of production and consumption may already be evident in relation to the material of the dwellings. Whilst locally made black tents are still common, a white cotton tent produced in Lhasa is purchased and being used by some nomadic families for the summer months. Traditionally, nomads have traded through barter and have made and maintained their own dwellings using their own resources. Since the majority of nomads rarely live above subsistence level, most could not afford to buy such an item, unless they have access to other capital-generating forms of work. It would be interesting to see if these tents are retained and maintained over time or mark the beginning of a repurchasing pattern. A few nomads appear to have adopted the yurt from the Mongols to the north, but because the black tent is a strong symbol of Tibetan identity, the yurt tends only to be used for ceremonial events or as temples by tribal groups.

Figure 11. Drawing of *sBra-gur* laid out showing central seam and opening (courtesy of B. Gordon/L. Kestrel).

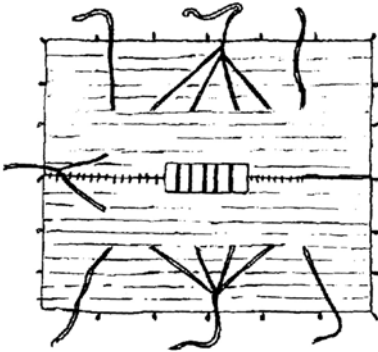
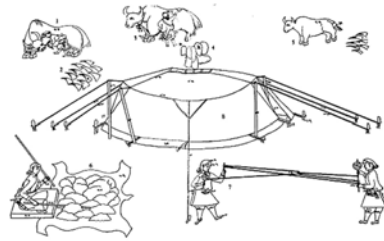


Figure 12. Tent making (courtesy of Lobsang Tenzing, artist).



Settlement and fabrication

There is a relationship between settlement and fabrication. Semper's models provide a way of exploring two key aspects of dwelling practice and production. They are inextricable and meaningless without understanding spatial ordering and making, as understood as continual remaking and accepted decay where the actual material is constantly in flux.

In a context of change and interface with dualistic paradigms, there is a danger of reading external decoration in isolation, and as ethnic 'label'/branding. Increased population movement, shifts in economic structure and resettlement programmes are leading to a 'no-choice' modernisation for the nomadic pastoralists of Eastern Tibet. Hierarchical Western values and development agendas related to patterns of permanence can validate this erosion of choice. The primacy of the city or urban place in any modernisation equation will have a dramatic

impact on new living patterns related to *sBra-gur*, the black tent, as well as to the rural dwelling house, where a new hybridity is emerging.

Conclusion

Existing patterns of dwelling practice and production in relation to *sBra-gur* and the traditional house in eastern Tibet include significant relationships with the land, the sedentary population and particular places within the landscape. Temporary 'home' structures are often seen as less complex than their 'permanent' domestic counterparts. However, similarity of explicit and implicit internal arrangements and symbolic meaning demonstrate equivalence in the context of Tibetan dwelling patterns in relation to the land. Hearths in the landscape are a powerful physical and symbolic presence, which emblemises the traditional nuances and cultural complexity of these dwelling patterns. In the contemporary

context of development and change in Tibet they powerfully provoke a picture of the possibility of further inhabitation or ruin by presence or absence of dwelling in the future.

The interiority and symbolic interior ordering of dwelling practice, is a sophisticated model based on spatial interrelationships within a simple physical framework. The material and decorative aspects of the structure and stuff of the tent are subject to constant cycles of renewal and share this immaterial framework, Semper's 'sacred symbol of civilisation'.

Redefinitions and shifts of traditional paradigms implicit in globalisation and modernisation are that the land is an object of resource for production and consumption rather than an interconnected part of the symbolic, cultural, economic and physical environment. Migration to urban areas is a pattern, which has major impacts on rural areas and is now a significant issue in Central Asia. Modernisation projects including new roads, power, health and education infrastructure are following a predominantly Western model. There is a resulting conceptual and physical fragmentation of the traditional Tibetan sedentary/trading/nomad dwelling patterns. Alongside urbanisation, including nomadic resettlement programmes, environmental conservation may include or exclude nomads as part of the landscape, perhaps rather than society. Understanding existing material realisations of house and tent in Eastern Tibet reveals a sophisticated cultural 'everyday'.

Notes and references

1. W. Hermann, *Gottfried Semper: In Search of Architecture* (Cambridge Mass., MIT Press, 1984).
2. A. Roy, 'Traditions of the Modern: A corrupt view' in *Traditional Dwelling & Settlement Review* (Volume XII no. 11, 2001) pp. 7–19.
3. The 'emptiness of the room' and the associated 'remnants of the mobility of nomadic culture' alluded to for instance in Sverre Fehn's reflections on Le Corbusier and his fascination for primitive Morocco, see C. Norberg-Schulz, and G. Postiglione, *Sverre Fehn works, projects, writings 1949–1996* (New York, The Monacelli Press, 1997), English translation.
4. However this timelessness is not necessarily equivalent to continuity. A culture which 'seems' timeless, is acknowledged still to be subject to change, 'a distilled and pure form of tradition that can only be romanticized, that is worthy only of museums. Here traditional practices are recovered as reservoirs of pure meaning, standing in timeless opposition to modernism and modernization', C. Norberg-Schulz, *ibid.*, pp. 242–3.
5. Kham is one of four main ethnic Tibetan groups and relates roughly to a geographical area in the north east of the current boundaries of the Tibetan Autonomous Region, South West China. TAR was designated in 1965 as a political region of The People's Republic of China. For background literature to Tibet's history see Carrasco (1959), Denwood (1980), Grunfield (1987), Mullin, Norbu, Richardson, Stein, Tucci, Waddell. For detail on recent political history and the Khampa uprising, see Tsering Shakya, *The Dragon in the Land of Snows: A History of Modern Tibet since 1947* (London, Pimlico, 1999).
6. *Die Vier Elemente der Baukunst*, written in 1850, published 1851. His work was 'corroborated by evidence of the Carribean Hut' displayed within the glass enclosure of the Crystal Palace Exhibition, an early representation of the interdependency of the modern and traditional, the progressive and the backward, as built structure. Frampton points out that this 'proposed an anthropological counterthesis to Laugier's

- primitive hut of 1753'. His proposed model comprised 1) a hearth, 2) an earthwork, 3) a framework/roof and 4) an enclosing membrane. K. Frampton, 'Botlicher, Semper and the Tectonic: Core Form and Art Form' from *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*, by Kenneth Frampton, edited by John Cava (Cambridge Mass., MIT Press, 2001) also recently published in A. Ballantyne, *What is Architecture?* (London & New York, Routledge, 2002).
7. J. Rykwert, *The Necessity of Artifice* (London, Academy Editions, 1982).
 8. Hermann, *op. cit.*, p. 116.
 9. Preoccupations are evident in Mary McLeod, 'Everyday and 'other' spaces', in *Architecture and Feminism* (Princeton, Princeton University Press, 1996), and J. Till and S. Wigglesworth, *The Everyday and Architecture* (London, Architectural Design, 1998).
 10. See discussion in A. Rapoport, *House Form and Culture*, Foundations of Cultural Geography series (Prentice Hall, New Jersey, 1969); A. Rapoport, 'Sacred Space in Primitive and Vernacular Architecture' in *Liturgical Arts XXXVI* (no. 2, Feb. 1968) pp. 36–40; and P. Oliver, *Encyclopedia of Vernacular Architecture of the World* (Cambridge University Press, 1997).
 11. The author acknowledges the support of the Centre for Architectural Research and Development Overseas (CARDO), the School of Architecture Planning & Landscape, and the University of Newcastle Small Grants Fund awarded in 1999 to enable fieldwork under the auspices of the CS Foundation. Material is based on the author's fieldwork studies in Sichuan, PRC, in 1998–9 as well as ensuing literature reviews and documentation, including aspects undertaken by Nic Crawley as part of the School of Architecture Planning & Landscape BArch Linked Research Project in 2000 at the University of Newcastle.
 12. Recent films for example: *Horse Thief* (China, 1986); *Escape from Tibet* (UK, 1995); *Kundun* (USA, 1997); *Windhorse* (USA/Tibet, 1999); *Himalaya* (Tibet/France, 1999); *The Cup* (Bhutan, 1999). Western documentation and literature about Tibet has been noted to be 'strangely biased'. Many early sources were based on pioneer/travelling accounts such as Heinrich Harrer's well known, *Seven years in Tibet*, Alexandra David-Neel's early twentieth century accounts, and those of Govinda (1960), Mariani, Migot, Pallis and Lowell. Chinese documentation of Tibet tends to place it in the context of a 'minority culture' with agendas of modernisation and nationalisation. See various relevant essays in Thierry Dodin and Heinz R  ther, *Imagining Tibet: Perceptions, Projections and Fantasies* (Somerville MA, Wisdom Publications Inc., 2001), in particular Peter H. Hansen, 'Tibetan Horizon: Tibet and the Cinema in the early Twentieth Century' pp. 91–110.
 13. Goldstein in Ives & Messerli, *The Himalayan Dilemma – Reconciling Development and Conservation* (London, Routledge, 1990:232); Helena Norberg-Hodge, 'Tibetan culture as a Model of Ecological Sustainability' and Graham E. Clarke, 'Tradition, Modernity and Environmental Change in Tibet', both in Dodin and R  ther, *ibid.*, present aspects of the environmental debate.
 14. In a twenty first century characterised by a mobility of cultures, physically and conceptually, philosophers such as Gilles Deleuze have examined the idea of the nomad as a symptom of contemporary society. The mobility and exposure of the Tibetan exile community contrasts with the situation in the TAR.
 15. R.A. Stein, *Tibetan Civilisation* (London, Faber & Faber, 1972), p 211, translated by Stapleton Driver from *La Civilisation tib  taine*, Paris: 1962.
 16. B. Hillier and J. Hanson, *The Social Logic of Space* (Cambridge, Cambridge University Press, 1984)

- defines an elementary building as 'a closed cell with a permeability defining a contiguous open cell'.
17. Little literature on Eastern Tibet exists in English. Carrasco devotes work to the Kham area, and architectural types are outlined in Oliver under Tibet and Sichuan province, China. Various agencies involved in this region such as the US-based Kham Aid Foundation and UK CSF have produced reports in the 1990s. J. Studley outlines background to the particular region in 'Environmental degradation in SW China', *China Review*, Issue 12 (1999), pp. 28–33.
 18. For more detailed description see W.A. Semple, 'Symbolism & Ritual in Tibetan Architecture' in *Indian Institute of Architects Journal*, (Oct–Nov 1995), p. 43 and M. Dujardin, 'From fortress to Farmhouse: A Living Architecture', pp. 61–84 in F. Pommarret-Imaeda and C. Schicklgruber, *Bhutan: Mountain Fortress of the Gods* (Vienna, 1997); also C. Corlin, 'The symbolism of the house in rGyal-thang', pp. 87–92 in M. Aris and Aung San Suu Khyi (eds) *Tibetan studies in Honour of Hugh Richardson* (Warminster, Aris & Philips, 1980); F. Pommarret-Imaeda, 'The construction of Ladakhi houses in the Indus valley' in Aris et al, *ibid.*, – for symbolic aspects of Tibetan dwelling.
 19. The 'black tent' as a generic form, has its origins in Mesopotamia and has become the abode of nomadic groups in desert and mountain regions from the Atlantic north west of Africa, throughout the Middle East to beyond the Himalayas as far as Eastern Tibet. In Africa and the Middle East the domestication of the camel, and in Tibet the yak, has allowed the tents to be used over a greater distance and thus portions of the population break with traditional established agriculture and lead a life of nomadic pastoralism. The tents are found only in relatively dry zones. Regional variations are diverse, generated chiefly by climatic and environmental differences. They have become well adapted to a vast range of temperatures: from the hot desert regions where the tents are flatter and lower, offering better protection from the sun and winds, to those in wetter areas which tend to have more steeply pitched roofs which shed rain more effectively. The area of the field work was the lower grasslands/mountains in the northwestern-most part of Sichuan province, PRC. For literature on tents/nomads see S.C. Rijnhart, *With the Tibetans in Tent and Temple: Narrative of Four Years' Residence on the Tibetan Border, and of a Journey into the Far Interior* (London, 1902), p. 178; B. Gordon, 'More than Yurts: Tents of the Himalayas', in *Sacred Spaces* (Issue 12 1995), p. 14; Ekvall, Clarke (1987), Gordon, Myers, Faegre, Hatton, Pradyumma and Shulyer Jones.
 20. R. Khosla, 'Architecture in Tibetan Buddhism', *AAQ* (Jan–Mar 1972); Denwood, 'Introduction to Tibetan Architecture', *Tibet News Review* (Vol 1, No 2, 1980), p. 6.
 21. Originating from E.F. Schumacher's seminal critique, *Small is Beautiful: A study of economics as if people mattered* (London, Bland & Briggs, 1973) that formed a philosophical base for much of the Intermediate/ Appropriate Technology movement in the 1970s and 1980s.
 22. The area of Eastern Tibet, overlapping with the current People's Republic of China boundaries of Sichuan and Xining province, the Tibetan Autonomous Region has only in the late 1990s been opened up to visitors, and this is still restricted to some extent. Changes in rural production from domestic consumption to a more market dependent system is part of attempts to harness the Tibetan plateau. 'The Great Leap West' launched in June 1999 by President Jiang Zemin, articulates central ambition focused on rapid urbanisation in the Pacific east and related development of the west of the PRC to resource this. The remote location and independent lifestyles

- of the nomads is not surprisingly a target for change. The 'Brightness project' promoting 'solar energy helping northwest Chinese herdsmen' through the distribution of solar energy power stations and portable 'magic lamps' is an example. The press release of Xinhua via Individual Inc. (Xining Feb 5 1998) suggests that this breakthrough in provision of portable electricity allows herdsmen now to 'watch television or use washing machines at home thanks to solar energy'. This statement, while positively promoting an energy efficient and relevant source of power, assumes the acquisition and mobility of these modern products thus clearly undermining the traditional nomadic patterns, which exist without them.
23. P. Denwood, *op. cit.*, p. 3.
 24. Tibet Information Network, *China's Great Leap West* (Cheltenham, TIN, 2000), p. 13.
 25. R. Ekvall, *Fields on the Hoof; Nexus of Tibetan Nomadic Pastoralism* (Prospect Heights, Waveland Press Inc., 1968) includes full descriptions of aspects of nomadic life, for example 'Shelter' pp. 61–65 as well as line illustrations of tents and various activities, by the Tibetan artist, Lobsang Tenzing.
 26. E.M. Hatton, *The Tent Book* (Boston, Houghton Mifflin, 1969) p. 62.
 27. T. Grunfield, *The Making of Modern Tibet* (London, Zed, 1987), p. 121. Russian policy was to resettle all nomads. The 1950s Khampa uprising also demonstrated Tibetan suspicions of the mobility of the Eastern people groups, see Shakya, *op. cit.*, p. 173.
 28. G.E. Clarke, China's Reforms of Tibet and its effects on Pastoralism, *Institute of Development Studies Discussion Paper No 237* (Brighton, IDS Publications, 1987), p. 16; also see C. Mullin, *The Tibetans* (London, Minority Rights Group, 1981) pp. 9–12; K. Pradyumma, *The Changing Face of Tibet: The Impact of Chinese Communist Ideology on the Landscape* (Kentucky, University Press of Kentucky, 1976) pp. 43–44.
 29. Tibet Information Network, *op. cit.*, p. 95.
 30. Tibet Information Network, *op. cit.*, pp. 58, 129.
 31. Tibet Information Network, *op. cit.*, p. 25.
 32. Mullin, *op. cit.*, p. 19.
 33. Grunfield, *op. cit.*, p. 121; Ekvall *op. cit.*, pp. 94–97.
 34. Grunfield, *op. cit.*, p. 122.
 35. Pradyumma, *op. cit.*, pp. 42–3.
 36. Tibet Information Network, *op. cit.*, p. 19.
 37. K. Richardson, S. Ewing, J. Studley eds, *Vignettes of Bengda – Notes of our First Impression*, (http://www.geocities.com/john_f_studley/Bengda/vignettes.htm, 1999). Bengda was the location for initial fieldwork studies by a multi-disciplinary team of researchers in 1999 under the auspices of the CS Foundation, Loughborough, UK.
 38. Frampton, *op. cit.*, p. 144.
 39. J. Cuisenier/Toffin suggest four key categories for a spatial approach to the study of existing ('traditional') buildings: orientation, laterality, centrality, frontality, in Oliver, *op. cit.*, Vol 1.1.19, pp. 60–62. Other approaches to vernacular architecture are categorised in volume 1. Rapoport still remains significant in outlining a cultural approach to the study of buildings encompassing climate, site, beliefs etc.; Hillier and Hanson's spatial analysis analyses elementary building interiors in terms of synchronisation, spatial and transpatial qualities.
 40. Hillier and Hanson *op. cit.*
 41. See Oliver's differentiation of types of Tibetan house.
 42. See discussions on Heidegger's differentiation in Ballantyne, *op. cit.*
 43. Faegre, *op. cit.* p. 59.
 44. Norbu, *op. cit.*, p. 98; Ekvall, *op. cit.*, p. 51.

The classical model of the Spanish-American colonial city

René Martínez Lemoine

From the sixteenth century onwards, a unique pattern is used in the layout of cities in Spanish-America: the chessboard plan. The uniformity and extent of the model's use, from California to the Straits of Magellan, has been attributed to the provisions of the 'Laws of the Indies', specifically the Charter of 1523, from the Emperor Charles V. The paper proposes that the chessboard model derives, not from a particular piece of legislation dictated a quarter of a century after the first Spanish-American city was founded, but from the 'idealised image' of Santo Domingo, a city founded by Nicolas de Ovando in 1502. Its regular plan, so markedly different from the contemporary experience of the mediaeval town and, in the specifically Spanish case, intricate arabic patterns, became the paradigmatic example of 'the new city in the New World'. Santo Domingo was, in the early sixteenth century, the administrative capital of that world. Every captain, or plain soldier, in search of fame and fortune – or more precisely gold – arrived in and departed from Santo Domingo, the new and extraordinary modern city with wide and straight streets, an experience unknown to the average person of the sixteenth century. Thus the extended and idealised image of the chessboard represented, apparently, by this city, became the 'modern way' for the lay out of cities in Spanish America.

Introduction

One of the universally accepted principles of Spanish-American town planning history is the fact that cities were founded according to definite rules previously established by the Crown, namely Charles V in 1523, which were put into practice by the local Spanish *adelantado*, captain, *conquistador*, or whatever his title may have been. This 'fact', according to long-established tradition, is held to explain by itself the formal planimetric unity of the primitive layout of cities and the existence of identical cities in places so wide apart as Mérida in Mexico and Osorno in southern Chile (Fig. 1). Starting with the foundation of Santo Domingo (1502) by Nicolas de Ovando in La Española (now the Dominican Republic), a nearly

unique pattern of cities, the 'chessboard plan' extended into the New World as long as the conqueror's advance was in need of permanent settlements in which to dwell, and to defend or to consolidate the conquest.

From the nineteenth century to our times, historians have accepted with no doubts whatsoever that the foundation of cities from the fifteenth century onwards was the result of a clear foundational policy through the systematic application of a consistent body of legal dispositions: the 'Leyes de Indias para Poblaciones' ('The Laws of the Indies'). Barros Arana and other classic Chilean historians state, in very similar words, with reference to the city of Santiago:

Figure 1. General map of Spanish America.



According to the general practice introduced in America by the Royal Charter of 1523, the site-plan was divided into squares 150 'varas' long separated by streets 12 'varas' wide. [Vara: similar to the English yard, equalling 0.87 metres.]

More recently, Palm (1951), Guarda (1957), Kubler (1964), Benevolo (1968), Hardoy (1968), Gasparini (1968) and Zawizsa (1972), have maintained the same opinion:

Once upon a time there was a wise king . . . !
Curiously enough there is no mention of any legal basis for the foundation of cities by those writers who were to a great extent the witnesses of the foundational process. Pedro Cieza de Leon, who arrived in the Americas in 1531, was the author of 'Crónica del Perú', in which he describes in full

detail the foundation of cities such as Panamá, San Sebastian, Antioquia, Cártao, Cali, Pasto, Plata, Quito, Guayaquil, Loja, Lima, San Miguel and La Paz: he knows nothing or states nothing about any legal dispositions. Francisco López de Gomara, the author of a monumental 'Historia General de las Indias' (1551) tells us about the foundation of a dozen cities, completely ignoring any possibility of a defined legal procedure.

Juan López de Velasco, the author of 'Geografía y Descripción Universal de las Indias' (1576) and Antonio Vásquez de Espinoza, the author of 'Compendio y Descripción de las Indias Orientales' (1600), both works to be considered complete censuses of Spanish America with references to thousands of towns, cities and villages, give no hints as to the legal basis of the foundational process. According to López de Velasco, by 1574 there were more than 200 cities, 3500 Indian settlements, and more than 9000 Indian villages, not counting some scores which had been destroyed, depopulated, transferred to another site or simply disappeared from the ground and memory.

All this splendid, unparalleled flourishing of urbanisation built up in a few decades, less than a century, was due, if we believe in the theory of the wise king, to the systematic application of the Charter of 1523. However, this interpretation must be re-examined, not only because of the existence of notorious chronological contradictions between the foundation of cities and the promulgation of the correspondent law, but also because of fundamental differences to be found between the primitive Spanish-American 'chess-board' and the law itself. There seems to be no

real evidence that the 1523 Charter was ever known, put into practice or published in the Americas. (In fact, it was never published, apart from the copy sent to somewhere in the Americas, probably to Santo Domingo, the original being at the 'Consejo de Indias' in Seville.)

Up to the definitive organisation of the 'Consejo de Indias' in 1524, any law, instruction, Charter or ordinance concerning the administration of the New World was sent in the original to the colony concerned. Later on, it was ordered that originals should be kept at the Consejo, a copy being sent to the particular place for which it was intended, with instructions for registration in chronological order. This procedure led in a short time to a most confusing situation, not only at the Consejo itself, but in each one of the emerging countries. Early in the sixteenth century the number of legal dispositions was such that there was not, even at the Consejo, any idea of how to cope with thousands and thousands of mixed, contradictory, never used or replaced dispositions, most of them being valid for a particular place or for a definite problem in a definite place.

Even by the end of the seventeenth century there was nothing resembling an organic, systematic, complete code for the government of the New World. The Laws of the Indies were a complete mess, a dictionary in no alphabetical order, many of whose rules were in no order or had never been put into practice. In 1550 the Viceroy, Luis de Velasco, had given orders to compile and put in order the dispositions which had been received in Nueva España throughout thirty years. This was, it seems, the beginning of a long process which took more

than a hundred years to compile, organise and publish a complete code for the administration of the vast Spanish empire. The 'Recopilacion de Leyes de Indias' was published in 1680. Up to that date there were several attempts to codify the existing legislation, including some which originated in Nueva España and Perú. The first of these compilations was published in 1563 in Mexico by Vasco de Puga, including all the dispositions received in that Audiencia from 1525 onwards, that is to say, it did not include the 1523 Charter.

The history of the compilation of the Laws of the Indies is a story in its own right. For our purpose, it is enough to mention that the first successful attempt was due to Diego de Encinas, an obscure secretary at the 'Consejo de Indias', who worked on his own account for more than twenty years. This compilation, published in 1596 under the title 'Cedulario Indiano', includes all the legal dispositions which were in force by the end of the sixteenth century, omitting all those which were not in use or had been revoked. The 1523 Charter is not included in the Cedulario!

The 'Recopilación de Leyes de los Reinos de Indias'

The publication of the 'Compilation of the Indies' in 1680 constitutes the final effort to clarify and complete the confused legal situation of nearly two hundred years of administration. In fact, the 'Recopilación . . .' constitutes the first systematic body of legal dispositions to be considered as a complete code for the whole vast and distant Spanish domain. To a great extent it is the Spanish-American counterpart of the 'Siete Partidas' which

Don Alfonso, the 'wise king' gave to mediaeval Spain.

The 'Recopilación . . .', being an effort to codify and to modernise obsolete procedures, is not a real compilation in the sense of including every legal item ever introduced. On the contrary, it excludes everything out of use or never used, reformulating and unifying thousands of legal dispositions. From this point of view, it is not the best or most trustworthy basis for historical interpretation as there is no evidence whatsoever that one is using the original version of the law. In this respect, the 'Cedulario Indiano' is far more useful as it gives the full extent and original text of the law.

There are other problems in dealing with the 'Recopilación . . .' as a document for the period prior to 1680, that is, the uncertainty of its chronological process and the generalisation of its dispositions. The law was primarily intended for a particular situation in a particular place and there is very little which could be considered equally valid for such places as the Audiencia of Guatemala, the Reino of Quito, the Capitanía General of Chile or, for that matter, the Philippine Islands. Yet, present-day historians have considered the 'Recopilación . . .' as the source of a specific foundational policy and of a formalistic and unitarian intention regarding the disposition of the town plan for the colonial city. This belief derives from the modified version of the 'Recopilación . . .', which is a combination of the 1523 Charter and the Ordinance of 1573.

The modified version of 1573 includes what is perhaps the most famous and quoted passage in the town planning history of the Americas:

At the time of making the plan of the place, it must be divided by its squares, passages and plots by means of cord and ruler, beginning from the main square and taking the passages out from it to the gates and principal roadways, leaving enough open space to continue in the same manner, in case the population should greatly increase. (The Emperor Don Carlos, 1523.)

And that is all. These few lines, which are the only ones to be found in relation to the foundation of cities in a mixed, disorderly, and almost inexhaustible legislative provision, according to long-established belief, constitute the basis or the origin of the Spanish-American gridiron. This is hard to believe!

The primitive layout

According to López de Velasco, by the end of the first quarter of the sixteenth century, there were at least fifty new cities extending from Mexico to Colombia and Venezuela. From the foundation of La Isabela (1493) and the first Santo Domingo (1496) with spontaneous or irregular plans, the second Santo Domingo (1502) and La Havana (1511) with semi-regular patterns, to the complex orthogonal plan of Panamá La Vieja (1518) and the regular plan of Veracruz (1519) in perfect rectangles, there is a continuous and sensible evolution towards orthogonality and the perfect gridiron plan. From this standpoint, it is quite fair to consider that the 1523 Charter was the result of official recognition of a real fact; the existence of a relatively large number of cities built on the chess-board principle prior to 1523.

Guarda (1965), Benévolo (1968) and others have considered that the origin of the classical model of

American cities lies in the spontaneous introduction of mediaeval models for fortified cities in the Roman manner:

The regular plan, 'more romano', was faithfully transmitted through mediaeval times by the art of castramentation which was carefully codified by Don Alonso X, el Sabio, in the Second of his 'Siete Partidas'. In Navarra, Levante, Castilla, Vascongadas, Andalucía, from the twelfth to the sixteenth centuries, a number of regular foundations were established which are older than the well-known French bastides.

However, by their proximity to the Spanish-American foundations it is of the greatest interest to recall the ones created by the Catholic Kings, culminating in 1491 with the foundation of Santa Fe de Granada.¹

From here to the Americas there is but a small step which is covered by Nicolás de Ovando, a witness of the foundation of Santa Fe, and the delineator of the regular plan of Santo Domingo in 1502. (Fig. 2.)

Santo Domingo, the first Spanish-American 'chessboard'

If Santo Domingo is the result of a simple transposition of a mediaeval model to the New World, it is certainly not the result of a legal disposition established by the 'wise king'. What is perfectly clear, according to the 'Instrucciones . . .' given to Ovando, is that there were no instructions at all:

Item: Being also necessary to establish new settlements in La Española, and as it not possible to give any directions from here, you must see to the places and sites of the said Island, together



Figure 2. Santa Fe de Granada (Spain). Founded by the Catholic Kings in 1492. Taken from García, B., 'Resúmen histórico del Urbanismo en España' (Madrid, 1968).

with the quality of the land and people, and you must see to the establishment of new settlements in the number and places you consider to be appropriate. (Instrucciones al Comendador Ovando, 1501. Colección de Documentos inéditos de Indias.)

According to this text, one has to agree that he was a wise king after all!

NO-INSTRUCTIONS-FROM-HERE
Fernández de Oviedo, the sixteenth century historian, refers to the layout of the city, attributing it to the personal intervention of Ovando:

All houses in Santo Domingo are built of stone as those in Barcelona, but the layout is much better than that of Barcelona as the streets of Santo Domingo are flat and wide and, with no

Figure 3. Santo Domingo in La Española (now the Dominican Republic). Founded by Nicolás de Ovando in 1502. Taken from F. Chueca and L. Torres, 'Planos de ciudades Iberoamericanas y Filipinas' (Madrid, 1951).



comparison, much straighter. As the city was founded in our times, by means of compass and ruler, with all the streets to the same measure, it makes great advantage to any other city I have seen'.²

The city became famous for the quality of its buildings and the 'modernity' of its layout. Travellers, chroniclers, historians and cartographers who left their impressions of the city are unanimous in praising the regularity of the plan which was in fact so utterly different from their own European experience of the mediaeval or Islamic city. (Fig. 3.)

Geraldini, the first Bishop of Santo Domingo, describes enthusiastically his first vision of the city: I was astonished at the sight of such an illustrious city, its buildings being as imposing and beautiful as those of Italy, its very streets so wide

and straight that they can compare advantageously to those of Florence.

The poet Castellanos wrote in 1535:

Está su población tan compasada
que ninguna se yo mejor trazada

That is:

The city is so regularly measured
that I know of no other so well traced

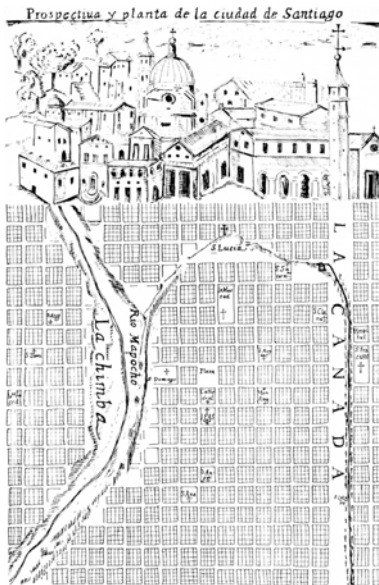
It is clear then that contemporaries considered the city to be perfectly regular; or, as Oviedo said: 'All the streets are the same measure'.

The reality is substantially different. The plan of the city is formed by five or six streets from east to west and seven from north to south maintaining a certain parallelism and giving way to trapezoidal blocks. The city projects an image of perfect regularity to which it would be possible to apply the description Alonso Ovalle gave of Santiago de Chile in 1646:

The plan of the city gives no advantage to any other, as it was traced by means of compass and ruler in the manner of a chessboard . . . the black and white squares being what we call there 'quadras' which are, all of them of the same shape and size, in such a way, that there is no one bigger than any other and they are perfect squares, from which follows that any man standing in the crossing of two streets can see north, south, east, and west with no impediments to sight.³ (Fig. 4).

This same vision appears time and again in all descriptions of Santo Domingo in such a way that its 'image' becomes the idealised model of the Spanish-American city.

There is no information concerning other cities founded in the first quarter of the century. The



primitive layouts of the cities founded by Alonso de Hojeda and Diego de Nicuesa in Castilla del Oro and Veragua, Ponce de León in Puerto Rico, Diego de Velásquez in Cuba, Juan de Esquivel in Jamaica, all of them from 1508 to 1514, have disappeared. 'There is no memory of what they were . . . ' says López de Velasco. All these expeditions departed from Santo Domingo, so it is fair to think that it is possible that they would have applied the 'model'

deriving from the idealisation of the primitive grid of that city. Palm suggests that the foundations by Rodrigo de Bastidas and Juan de Ampués in Venezuela, must have followed the same model, as both were former 'vecinos' or residents of Santo Domingo.⁴

'Instructions' prior to 1523

The importance attributed to the Charter of 1523 has obscured a number of 'Instructions . . . ' which the Spanish Crown gave to Pedrarias Dávila in 1523, Diego de Velásquez in 1518, Francisco de Garay in 1521 and Hernán Cortés in 1523. With slight variations in the text, all of them follow approximately the same pattern:

. . . the distribution of sites should be made in order in such a way that once the houses are built the village should look orderly, be it in the place assigned for the square and the church as in the proper order of the streets.

In places which are to be built, it is good to trace them in order from the beginning, so they will remain in order but those not following these dispositions will never be in order.

The Spanish text repeats the word 'order' six times in eight lines in a most clear manifestation of intentions which in no case are definite or precise. In practice, this type of 'order' can be interpreted in different ways. For Pedrarias Davila 'order' means a mixture of different squares and rectangles of different sizes like the ones forming the plan of Panamá la Vieja founded in 1519. (Fig. 5.) Undoubtedly we are still far from the perfect chessboard typifying the classical model of the Spanish-American colonial city.

Figure 4. Santiago, Chile. The extended image of the chessboard. Taken from Alonso de Ovalle, 'Historical Relation of the Kingdom of Chile' (Rome, 1646). English version published in the seventeenth century.

Figure 5. Panamá la vieja. Founded by Pedrarias Dávila in 1519. Taken from 'Monumentos históricos y arqueológicos' (Instituto de Geografía e Historia, México, 1950).



The *alarife* (surveyor) García Bravo, companion to Pedrarias in Panamá, was later in Mexico with Cortes participating in the foundation of Veracruz, México, and Campeche, in rectangular grids which are the characteristic of Mexican colonial cities in the sixteenth century, all of them prior to 1523. (Fig. 6.) From the rectangular grid to the classical model there is but a small step. In the founding of Granada, Santiago de León and Bruselas in Nicaragua by Francisco de Hernández as 'comisionado' of Pedrarias, the lay outs of the cities followed the model of Panamá la Vieja according to the 'Instrucciones . . . ' of 1513. These cities were

founded in 1523 and 1524. Archaeological findings in Santiago de León show a regular grid and a central plaza as a perfect square.

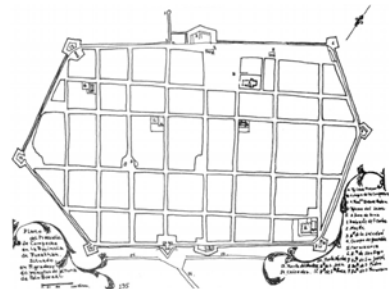
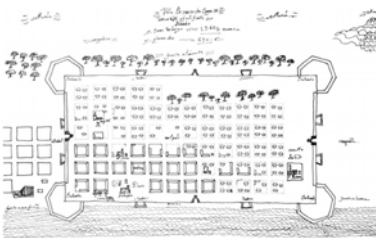
The foundation of Guatemala by Alvarado, a commissioner of Cortes, in 1524, was made according to the 'Old Book', the 'Libro Viejo de la Fundación':

with four plots in the centre of the lay out forming the plaza of the city, and with streets running from north to south and east to west . . .

Should it be suspected that Alvarado was aware of the existence of the Charter of 1523, it is necessary to point out that he had been for four years in complete isolation fighting indians and mosquitoes in the plains and jungles of Nicaragua.)

From Santo Domingo to Santiago de los Caballeros de Guatemala, or, from Ovando to Alvarado, covering the whole period previous to the Charter of 1523, some fifty cities were founded not including some twenty others which had been abandoned or destroyed. In all these foundations it is not possible to trace any signs of 'continuity' or

Figure 6. a) Campeche, México, 1608. The idealised image of the chessboard. Founded by Hernán Cortés in 1541. b) Campeche, Mexico, 1751. The real plan. (Both plans in F. Chueca, *op. cit.*)



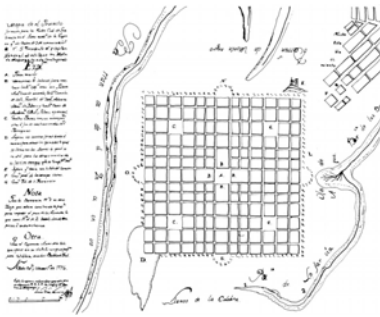


Figure 7. Santiago de los Caballeros, 1776 (Guatemala). A curious pre-plan which was laid out in the traditional manner and not as a mixed chessboard. From F. Chueca, *op. cit.*

In all these cases, the only visible link is the personal experience of each one of the 'conquistadores' with Santo Domingo, the first and spectacular city of the New World: 'much better than Barcelona', 'giving no advantage to Florence', 'no other so well laid out . . .'. It must be remembered that Santo Domingo, as the administrative capital of the Antillas, was the arrival and departure point for the Americas and the place from which every single expedition departed. Thus, the nearly regular chessboard delineated by Ovando becomes the idealised model of the 'modern' city in the New World, a model which will be recognised and made official by successive legislative actions.

of the eventual rising of a Spanish-American tradition deriving from a sort of foundational continuum.

Practically all these foundations are related in one way or another to the 'Instrucciones . . .' given to Pedrarias, Garay, Velásquez and Cortés, which were put into practice according to the particular interpretation of each one of them. This is better understood if we consider that Hernández, a commissioner of Pedrarias, proceeding from Panama, establishes a regular layout quite different from that city, and Alvarado, a commissioner of Cortés, makes his own 'square' chessboard against the rectangular grid of the latter. The result is a sort of spontaneous, primitive, experimental chessboard which begins to take its definitive form, the 'classical model', with the foundation of Santiago de León (Nicaragua) and Guatemala, and which reaches absolute regularity in Lima (1535), Santiago de Chile (1541) and Buenos Aires (1536). (Fig. 7.)

From 1523 to 1573 and onwards

We have stated that there is no evidence that the Charter of 1523 was ever published or applied in America. On the contrary, its real value may be deduced from the fact that it is not even mentioned in a series of 'Instrucciones . . .' and 'Capitulaciones . . .' given to Rodrigo de Bastidas in 1525, Francisco Pizarro in 1529, Pedro de Heredia in 1533, Pedro de Mendoza in 1534 and Alvarez de Toledo in 1568. These 'Capitulaciones . . .' led to the foundation of at least Santa Marta (1525), Cartagena (1533), Lima (1535) and Buenos Aires (1536). (Fig. 8.)

The text of the 'Capitulaciones . . .' is very similar in all cases. The one given to Pizarro runs like this: Item: We give our consent for you to build, in agreement with our captains, a number of four fortresses in the sites and places which will be considered to be most appropriate or convenient. Neighbours and settlers are to be given lands and plots in relation to their position, according to

Figure 8. Mendoza (Argentina). Foundation plan by Pedro del Castillo in 1561. Taken from T. Thayer Ojeda, 'Las antiguas ciudades de Chile' (Santiago, 1911).

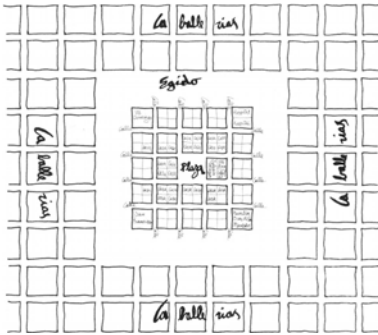
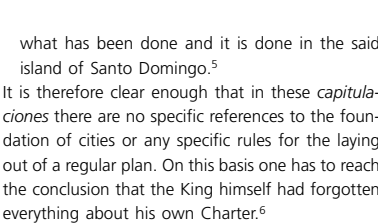


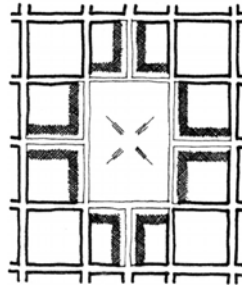
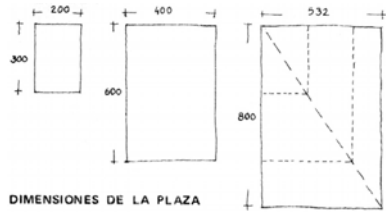
Figure 9. The Plaza Mayor, according to the Ordinances of 1573. Taken from R. Alegria, 'Historia de la ciudad de la Serena' (Universidad de Chile, 1960).



what has been done and it is done in the said island of Santo Domingo.⁵ It is therefore clear enough that in these *capitulaciones* there are no specific references to the foundation of cities or any specific rules for the laying out of a regular plan. On this basis one has to reach the conclusion that the King himself had forgotten everything about his own Charter.⁶

The 'Ordenanzas de Poblaciones' of 1573

The definitive code for the foundation of cities in the Americas comes from Don Felipe II in 1573, under the title 'Ordinance for New Discoveries, Conquests and Pacifications'. According to López de Velasco there were more than 200 cities existing in Spanish America by that date. The classical model had already reached its perfection and ruled overwhelmingly as the only pattern of foundations from California to southern Chile. The new legislation, however, begins by ignoring the established



situation and pretends to impose a new layout originating in a rectangular square:

The 'Plaza Mayor' from which the city is to be delineated... must be laid in such a form that its length should be one and a half times its width . . . considering that the place may go in great increase, it should be at least 300 feet long and 200 feet wide, 800 feet long and 532 feet wide and it should be of medium and good proportion if it takes 600 feet long and 400 feet wide'. (Fig. 9.)

It is beyond the scope of this paper to analyse in detail other contradictory items of the new legislation. It must be said, however, that contrary to the Charter of 1523, which was never published, remaining in its codex form, written with goose-quill pen and intricate sixteenth century hand-writing, the 'Ordenanzas . . . ' were effectively published and diffused. Official documents very often quote its dispositions in relation to the foundation of cities. It is, therefore, quite surprising that in spite of its real and objective diffusion, this definitive legislation makes no changes in the established Spanish-American tradition.⁷ The 'classical model', in perfect chessboard form, continues to be, practically to our own days, the sole and only organising principle of the Spanish-American city.

The image of the city

In the course of this article, emphasis has been laid upon the visual and mental aspects which have supposedly led to a process of 'cultural transmission' in the development of the Spanish-American chessboard. The 'modern' situation represented by the long, wide and straight streets of Santo Domingo, crossing at (apparently) right angles and leaving an open view in all four directions, culminates in creating a mental image of the Spanish-American city, a 'public' image according to Kevin Lynch. This public image is, up to the present day, the authentic symbol of the city in the Americas. For every one of us, citizens of a quadrangular world, the square plaza and the square blocks are the means by which we understand and organise our urban environment, the module and the model of what is meant by 'city'.



Figure 10. a) Santiago, Chile, 1825. Plan of the City of Santiago. Taken from John Miers, 'Travels in Chile and La Plata' (London, 1826).

The object 'city' does not always present the same definite and distinctive characteristics, but the mental model has acquired identity and consistency through a long process of internal assimilation. Thus, the extended image of the chessboard tends to be assimilated to reality through the pattern already internalised by the observer. In this way the image of the regularity of cities extends far beyond its real existence. Geographers, cartographers and engineers 'see' chessboards everywhere in the Americas in such a way that planimetric accuracy gives way to the idealised image of the chessboard.

For instance Frezier in 1712, and John Miers in 1825 leave idealised plans of the city of Santiago according to their 'previous' idea of regularity (Fig. 10, a) and b)). In the same way, a number of semi-regular cities such as Havana (1519), Santiago of Cuba (1519), Quito (1534), Campeche (1542), Valdivia (1556) are praised for their regularity, it being obvious that for practical and visual purposes apparent parallelism is as effective as real parallelism (Fig. 11).

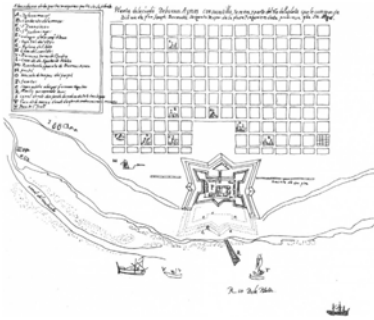
Figure 10. b) Santiago, Chile, 1831. The real plan. In Claudio Gay, 'Atlas de la historia de Chile' (Paris, 1834).



Figure 11. La Havana, Cuba. Founded by Diego de Velasquez in 1519. Taken from J.N Belin, 'Le Petit Atlas Maritime' (Paris, 1756).



Figure 12. a) Buenos Aires, Argentina. The idealised plan by J. Bermudez (1708). Taken from Chueca, *op. cit.*



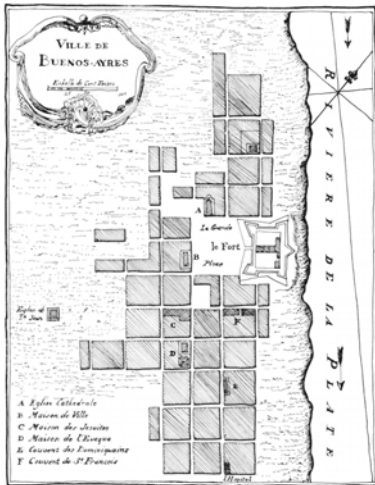
much for the epoch . . . Joseph Bermudez drew a plan of Buenos Aires in 1708 showing 148 square blocks while Charlevoix in 1756 gives less than 30! (Fig. 12, a) and b.)

The number of examples is practically endless. The classical model becomes a sort of mental heritage, a planimetric habit which will continue to rule successive foundations even towards the beginning of the twentieth century.

The 'Plaza Mayor'

The most important feature of the 'public image' is the Plaza, that empty square in the middle of the city. It constitutes, at the same time, the landmark of the city, its focal point and the synthesis of the urban condition. If it were not for the Plaza, there

The extended image of the chessboard goes as far as to culminate in a series of plans of different cities showing extensions of squared blocks surpassing the real extension of the city. Alonso Ovalle shows the city of Santiago in 1646 as having 288 blocks (Fig.4), while Frezier, sixty-six years later, shows only 88 blocks, which apparently are also too



would be no order or recognisable structure in the undifferentiated chessboard. We, in Spanish America, understand the city, any city, beginning from the central, empty square. We 'know' that a city is a pattern of streets crossing at right angles. We 'know' that in the centre of the pattern there is a block missing, an empty square, and we know that around this empty square we will always find the Cathedral, the Municipal Building, the Post Office, the Central governmental offices, the Bank or, at least a Bank, and the main Hotel. This is simply a 'fact', something that is in the natural order of things. . . . (Fig. 13).

The Plaza and the activities taking place in it are the most important clues for our understanding of the city, the place from which we derive our knowledge of the city and from which we learn how to use the rest of it. From this point of view, the 'Plaza' is an abstract concept which is even previous to the knowledge and use of the city, a sort of mental heritage but, better still, a veritable cultural feature which is utterly and definitively linked to the very concept of urban order and urban activity in the Americas.

Notes

1. Guarda, Gabriel: 'Santo Tomas de Aquino y las fuentes del urbanismo indiano' (Santiago, 1965).
2. Fernández de Oviedo, Gonzalo: 'Sumario de la Natural Historia de las Indias' (Seville, 1526).
3. Ovalle, Alonso de: 'Histórica Relación del Reino de Chile' (Rome, 1646).
4. Palm, E. Walter: 'El urbanismo imperial en América' (México 1951).
5. Prescott, William: 'Historia de la Conquista del Peru' (Ed. Suma, Buenos Aires, 1944).
6. Encinas, Diego de, 'Cedulario Indiano' (Seville, 1596; Instituto de Cultura Hispánica, Madrid, 1945).
7. Recopilación de Leyes de los Reinos de Indias (Seville, 1690; Consejo de la Hispanidad, Madrid, 1943).

Figure 12. b) Buenos Aires, Argentina. The real plan by A. Charlevoix in 1776. Taken from Berin, *op. cit.*

Figure 13. The Plaza Mayor, Santiago, Chile (seventeenth century). Taken from Cesar Famin, 'Amerique Meridionale' (Paris, 1840).



From *shikumen* to new-style: a rereading of *lilong* housing in modern Shanghai

Chunlan Zhao

This paper provides a rereading of a particular dwelling form under the general name of *lilong* that has constituted the primary living space in the inner city of Shanghai, where ordinary Shanghainese have conducted their everyday life for more than a century (1870s–1990s). Attention is given to two types of *lilong* neighbourhoods, in which two housing types are involved respectively: one is the so-called *shikumen* neighbourhood, including its early multi-bay model and a later double- to single-bay model, which are believed to derive from a more native dwelling concept and value system; the other is the so-called new-style neighbourhood, which is believed to have its origin in western dwelling culture brought in by foreign sojourners and welcomed by locals. Based on a combined historical and typo-morphological reading, changes in both types can be identified at housing unit level and neighbourhood level. In terms of the neighbourhood structure in relation to a larger urban block, a dual structure of ‘outside shops and inside neighbourhoods (*waipu-neili*)’ was commonly adopted in *shikumen* neighbourhoods that helped to integrate those pocket-like houses into the fast-modernising urban environment through a mixed land-use pattern, while a more pure residential environment was created in the new-style housing neighbourhood where very few or none shop houses were to be found as ‘mediators’ between the neighbourhood and the urban. Differences in their unit plans also revealed a shift from a more metaphoric layout to a more functional layout, from the clan/family-based courtyard-centred living to the community-based alley-centred living, from a self-contained traditional living style towards a more open, more independent modern urban living style. Nevertheless, under the general name of *lilong*, these dwelling forms as a whole shared much of the experience of ‘alley-living’ that was due to simultaneous densification – the inhabitants turned this transitional space into a shared living room and multifunctional space, through which a particular local dwelling culture was created. As the first kind of mass commodity housing produced and consumed in the dynamic of local/foreign interactions within a market mechanism, *lilong* dwelling played a transitional role in Chinese urban history by challenging age-old values in the traditional dwelling system and bringing it further towards its modern version.

Introduction

During the first half of the twentieth century, while a minority of foreigners and some well-to-do Chinese had been living in high-rise apartment buildings, garden villas or mansions in Shanghai, enjoying much of the modern facilities and services provided in this 'oriental Paris' or 'New York of the East', the majority of the urban population, mainly composed of two major groups, the little urbanites (*xiaoshimin*) and the urban poor, had lived a life much 'beyond the neon light'.¹ Apart from shanty towns or slum houses, that spontaneously sprang up in and out of the city and were resided in by the latter group merely for survival, a much more regulated high-density urban residential neighbourhood was provided for the former group under the general name of *lilong*, which composed about three-quarters of the city's dwellings until the middle of the twentieth century. Their inhabitants, the middle and lower-middle classes composed mainly of small businessmen, office clerks and manufacturing workers, many of whom had migrated from other parts of the country, had little choice but to squeeze themselves into this new type of dwelling as a primary living place/space, upon which much of their urban experience, if not all, was conducted on a daily base.

As a response to the rising housing demand caused by continuous rural-to-urban migration in a climate of domestic turmoil, rural depression and urban industrialisation, two kinds of *lilong* housing were commonly built, including the *shikumen* housing neighbourhoods from the early 1870s, and the new-style housing neighbourhoods at the beginning of the twentieth century, which both

reached their climaxes between the 1920s and the 1930s along with the urban development of modern Shanghai. Despite their gradual dilapidation in the followed decades and recent fast disappearance in the course of urban redevelopment, they have no doubt played a key role in providing the primary living space for the majority of Shanghaiese during the past century, a factor which has remained a keen topic not only within local academia but has also attracted increasing attention, debate and concern among the general public recently. In this paper, the author tries to identify the significance and uniqueness of *lilong* as a particular dwelling form in a process of moving from tradition towards modernity, which succeeded in breeding a transitional yet new urban dwelling culture within its particular local historical context.

Literally, *lilong* is a combination of two equally important words *li* and *long*. According to *The Great Chinese Vocabulary Dictionary*, *long* is used as a noun here, referring to a small street, an alley; while *li* is a word that has been always associated with human settlements in different ways: 1) a place where people live, such as villages in the countryside or neighbourhoods in cities; 2) a home town; 3) dwellings in a neighbourhood; 4) a basic organisational unit in residential management in ancient China, ranging from 25 households to 50, 72, 80, 100 and even 110 according to different historical periods; 5) a measurement unit of length in ancient China, about 500 metres.²

In the case of Shanghai, the word *lilong*, as an abbreviation of *lilong* housing neighbourhood, is a rich concept that not only refers to the materiality of this dwelling form, but also to the vivid social

life within and around it, which can be characterised in at least three ways: 1) the physical forms of three to four major housing subtypes that had been developed during the late nineteenth century and early twentieth century and had shared a similar neighbourhood structure, being organised along small alleys;³ 2) the social community that had been regrouped based on such neighbourhoods; 3) a particular dwelling culture that had been created by the inhabitants within this unique dwelling form.

At the beginning of this paper, a brief historical background to the City's development is provided, especially the establishment and expansion of the area of foreign settlements, which has always constituted the core area of the City since its modern era began. Then an overview is provided to explain the emergence and the development of these two different *lilong* housing models. Further analysis and comparison are made based on typomorphological reading at both housing unit level and neighbourhood level, which forms the main argument of the paper. Finally, a conclusion is provided as an interpretation of the particular dwelling culture of *lilong*, and its implications in architectural as well as socio-cultural perspectives.

Socio-historical context

Pre-modern Shanghai in 'the rural-urban continuum' landscape

Before the opening to the West, Shanghai was very much an ordinary node in a water-town network in the *jiangnan* area of China⁴ (Fig. 1). Starting as a small fishing village, Shanghai emerged as a rising trading port during the Song Dynasty, and was offi-

cially announced as a county town in 1292 after reaching a population of 300,000, about 72,502 households. With the construction of the city wall and moat between 1553 and 1618 to defend itself from plunder by Japanese pirates, the city became more defined in its shape and form, covering an area of two square kilometres (Fig. 2). Nevertheless, like all other Chinese cities, which functioned mainly as different fixation points for the feudal administration system – government *yamen*, taxation, corvée, courts, together with some increasing commercial activities since the post-Song era – Shanghai remained merely a dot on the fringe of the empire geographically as well as politically (Fig. 3).

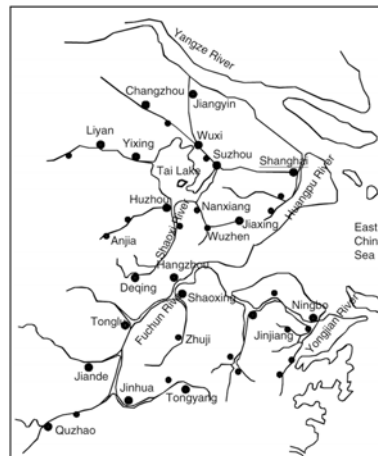


Figure 1. Shanghai as a node in the water-town network in the *jiangnan* area of south China. (Adapted drawing based on Zhang Tingwei's sketch in 'The Water Town Region in South East China', in: *Open House International*, Vol. 12, No.1. 1987.)

Figure 2. Map of the walled Chinese city of Shanghai in the early nineteenth century. (Source: originally in *Record of Shanghai County*, Jiaqing Period of the Qing Dynasty, as reprinted in *Shanghai Chengshi Guihua Zhi*, 1998.)



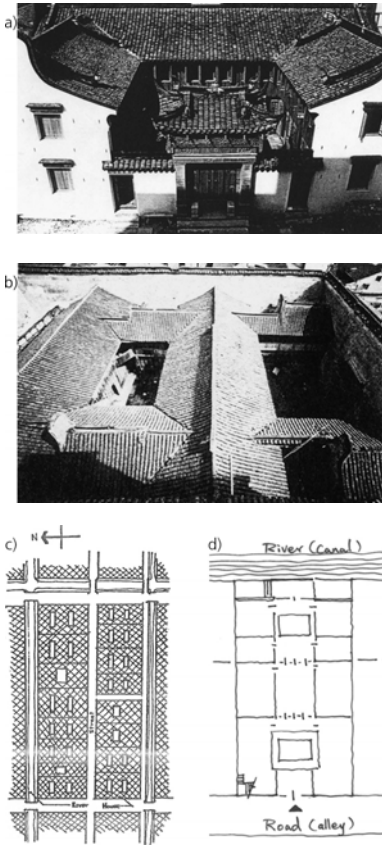
Figure 3. Representation of the cityscape of the Fangbang area in Shanghai in a Ming Dynasty painting. (Source: *Shanghai Chengshi Guihua Zhi*, 1998.)



Moreover, amid 'the urban-rural continuum',⁵ as Lu Hanchao points out, as part of an 'harmonious landscape in which cities and villages at various administrative and commercial levels, as well as in different geographic regions, were integrated with each other',⁶ cities never gained the sense of urban superiority over the countryside that is commonly associated with a Western context, especially a marginalised city like Shanghai. Based on the

researches of M. Weber,⁷ F.W. Mote, G.W. Skinner, and Lu, three major reasons that account for such a phenomenon can be summarised here: 1) not only peasants but also the powerful Chinese elite class were rurally rooted, whose socio-economic base was in rural communities rather than in urban centres and who always kept close ties with their native place, where their formal place of residence, their permanent property, their family tombs and lineage temples were located; 2) Chinese cultural life and religious sites were spread across the country without a clear-cut division between the urban and the rural so that cities (except for a few capital cities) were never perceived as culturally superior to small towns and villages; 3) Chinese cities didn't possess a corporate identity, civic monuments or 'citizens' that distinguished them from their surrounding rural areas⁸ (Fig. 4).

Except for numbers of official scholars (*shidafu*) and guest merchants (*keshang*) who resided in urban settings most of the time for fulfilling their occupations and careers, little evidence indicated any large rural-to-urban migration trend, but rather a flow of population in both directions following frequent communication of various sorts, like monthly markets, temple fairs, annual imperial examinations, etc. In fact, according to Lu, in contrast with the ideal and much appreciated rural living style in traditional China, a rather common negative social sentiment towards urban living was largely recorded or reflected in classic works by figures including the early Han historian Sima Qian⁹ (145–90 BC) and the Qing thinker Gu Yanwu¹⁰ (1613–1682 AD). *A Thousand Li of Rivers and Mountains* (1114 AD), a rare 12 metre-long ink and colour painting is further evidence of



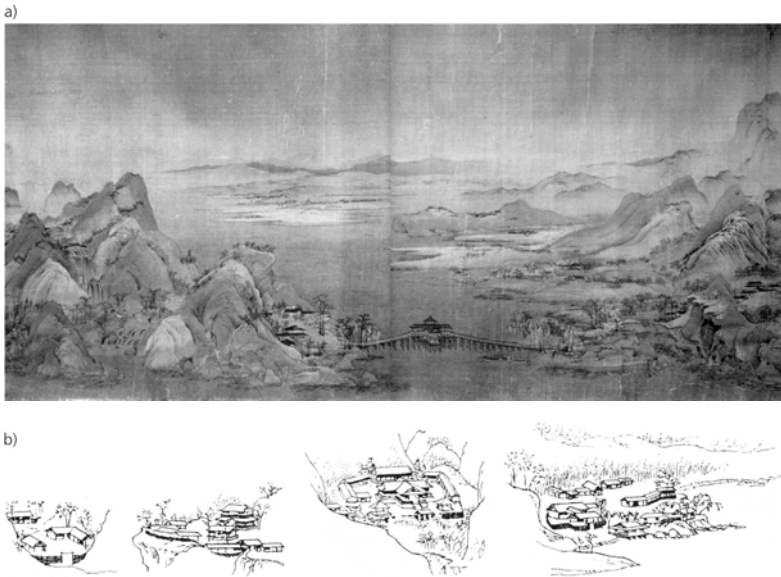
the dwelling environment in the south China region historically¹¹ (Fig. 5).

Establishment and expansion of foreign settlements

The picture started to change after Shanghai became the first Chinese treaty port forced open to European trade and concessions following the defeat in the Opium War in 1842. In 1845, the British Consul George Balfour and the Shanghai *Daotai*¹² Gong Mujiu signed the first 'Land Regulations', which expedited the birth of a British settlement officially recognised in 1846.¹³ Following similar motives and approaches, the French Concession was established after a lengthy negotiation between the French Consul Louis Montigny and the Shanghai *Daotai* Lin Gui in 1849.¹⁴ As for the American Settlement, it started from an oral agreement between Bishop William J. Boone and Shanghai *Daotai* Wu Jianzhang in 1848, related to a concentration of permanent rent rights for the American Church Mission, which was located on the north side of the Suzhou Creek opposite the British Settlement.¹⁵ Clearly, by the end of the 1840s, three major western powers all had their settlements *per se* in Shanghai. In the following decades, all of these settlements expanded enormously, during which time the International Settlement was formed as the amalgamation of the British and American settlements in 1899. Before World War I, the total area of Shanghai's foreign settlements reached more than 3,255 hectares, almost fifty eight times larger than the first British Settlement established in 1846, and twelve times larger than the original walled Chinese city (Fig. 6).

Figure 4. Traditional courtyard dwelling commonly seen in both rural and urban settings in south China, a) and b) from: *Shanghai Housing 1949–1990, 1994*, inserted colour images of 'traditional dwellings'; c) from Zhang Tingwei, 1987, *op. cit.*; d) by the author. a) front, bird's-eye view of a three-sided courtyard house; b) bird's-eye view of the complete two-courtyard housing compound; c) typical dwelling pattern in south China water towns; d) typical plan of two-courtyard housing between a river/canal and an alley.

Figure 5. a) 'The rural-urban continuum' in an artistic representation. Part of the original painting *A Thousand Li of Mountains and Rivers* (1114) by Wang Ximeng (1096–1119). (Source: <http://art.enorth.com.cn/zhwh/scsh/images/1s-8-d.jpeg>.) b) Different-scaled rural dwelling environments taken from the same painting, from left: small, medium, large, and village-like. (Source: Liang Xue, 'A Glimpse of the Chinese View of the Environment through Settlement Site Selection', in: Wang Qiheng (ed.), *Fengshui Lilun Yanjiu*, 1992.)



According to the first Land Regulation of 1845, these special territories were agreed to be reserved for foreigners only, mainly diplomats, traders, missionaries as well as their servants and families, in which to build their own housing settlements so interference with the local Chinese settlements could be avoided. As a result of this segregation policy, by the end of 1840s, the native Chinese who used to live there had 'generally left of their free will and were liberally remunerated for their property by

foreigners'. It seems, at least in the following decade, this segregation continued without much difficulty as most native Chinese concurred with the government's intention to keep the foreigners out of the city and showed little objection to 'moving gradually backwards (westward) into the country, with their families, effects, and all that appertained unto them' including their family tombs.¹⁶ Meanwhile, the increasing foreign sojourners, from 50 in 1844 to 500 in 1853,¹⁷ had started transforming the

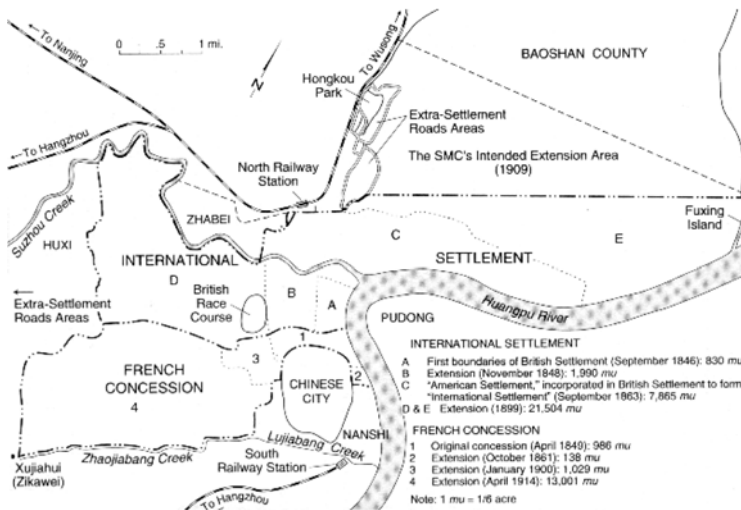


Figure 6. Establishment and expansion of foreign settlements in Shanghai (source: Lu Hanchao, 1999).

former agricultural land into their new homes, and further into an urban condition based more or less on the English and French models: solid stone-structured churches and banks, luxurious hotels and mansions, large-scale factories and warehouses, wide avenues and a race course, cars and trams, universities and hospitals, cinemas and theatres, etc.

From segregation to mixed residence

One may speculate that, if there had not been the uprising of the Small Daggers Society (SDS, *xiao-daohui*) in 1853, such a residential segregation

system might have led the city into a different future. However, history gave no opportunity for that. In the turmoil of the rebels and fighting, thousands of refugees, mostly from the walled Chinese city but also from other adjacent towns and countryside, poured into the foreign settlements, an extraterritorial space under the jurisdiction of foreign powers that the rebel forces hadn't planned to attack even though they were within walking distance of the war-torn city.

The suppression of the Small Daggers uprising in 1855, by cooperation between the local Chinese government and the foreign military

forces volunteered, did not end Chinese migration into the foreign settlements. The successive impact of the much more violent and destructive Taiping Rebellion that reached the region in the early 1860s created more panic and drove even more refugees into Shanghai's foreign settlements for protection and survival. By the end of the Taiping Rebellion around 1865, well over 110,000 Chinese from several neighbouring provinces and regions had moved into the foreign settlements of Shanghai.¹⁸

With a sudden increase to a large Chinese population in the foreign settlements, i.e. more than 20,000 in the combined British and American settlement alone, problems emerged such as public security, sanitation and taxation affairs, and also the possible conflicts between foreigners and Chinese. Stimulated and urged by such a new situation, a hot debate started between two opposite opinions within the foreign community over whether to continue accepting the Chinese refugees. But soon the debate was ended with a 'lecture' given by an outspoken British merchant Edwin Smith:

No doubt your anticipations of future evil have a certain foundation, and, indeed, may be correct enough, though something may be urged on the other side as to the advantages of having the Chinese mingled with us, and departing from the old Canton system of isolation; but, upon the whole, I agree with you. The day will probably come when those who then may be here will see abundant cause to regret what is now being done, in letting and subletting to Chinese. But in what way am I and my brother landholders and speculators concerned in this? You, as H. M.'s consul, are bound to look

to national and permanent interests – that is your business; but it is my business to make a fortune with the least possible loss of time, by letting my land to Chinese, and building for them at thirty or forty percent interest, if that is the best thing I can do with my money. In two or three years at farthest, I hope to realise a fortune and get away; and what can it matter to me if all Shanghai disappear afterwards in fire or flood? You must not expect men in my situation to condemn themselves to years of prolonged exile in an unhealthy climate for the benefit of posterity. We are money-making, practical men. Our business is to make money, as much and as fast as we can; and for this end, all modes and means are good which the law permits.¹⁹

Taking this as a representative view among the majority of foreign merchants then in Shanghai, the three consuls, the British Consul Sir Rutherford Alcock, the American Consul Robert C. Murphy and the French Consul B. Edan, were convinced. Soon the segregation policy was officially abandoned and the mixed residential policy was legalised in the new Land Regulation released in 1854, which served as the fundamental law, or 'constitution' for overall foreign settlement of Shanghai until the settlement was abolished in 1943. Despite the opposition of the Chinese *Daotai* who still didn't want to see mixed residence in Shanghai, by the late 1850s, there was no doubt that the foreign settlements were no longer a reserved area for foreign residents, but rather a special zone increasingly populated by Chinese but governed by Westerners, under the authority of the new Shanghai Municipal Council (*gong-bu-ju*).

From then on, the International Settlement, the French Concession and the Chinese district²⁰ became the three major components of a growing Shanghai Metropolis. As the population in the foreign settlements continued to grow, the centre of Shanghai city gradually shifted from the walled Chinese area to the foreign settlements during the second half of the nineteenth century. Although quite different urban images can be identified and read in the built environments among these three districts, embedded with different administrative systems, cultural origins, values, interests and habits, it is arguable that there was at least one factor which had helped the city in retaining its totality to a large extent – a particular pattern of mass dwelling artefact, *lilong*.

Emergence and development of *lilong* housing

The embryo of lilong

Under the new mixed residential policy, as a natural response to growing housing demand, property became suddenly the most profitable and least risky business, so that almost all foreign businessmen who had some money made a big investment shift from conventional trading to this new industry.²¹ In fact, big foreign corporations in Shanghai, such as Sassoon, Jardine & Matheson and Gibbs Livingston, who used to trade in opium, all started their property businesses then. Soon the business of housing became the main source of taxes for the newly established municipal council. With sufficient capital, labour and land, Shanghai was ready to grow into a prosperous metropolis.

The houses that E. Smith had referred to earlier were those that could be quickly and simply

constructed with wooden boards at the lowest cost: built in rows like army camps, accessed by some internal paths joined with one general path that connected to the public street, where a gate was used for entry and exit control. Each estate was given a name ending in 'li', referring to a neighbourhood. Despite their simplicity and crudeness, they were rather popular among frightened migrants, whose priority was to find a foothold in this 'safe' territory, so the physical condition of the house was secondary. It was this uniformity in neighbourhood structure that constituted the embryo of later *lilong* neighbourhoods.

In less than a year after the uprising of the SDS, from September 1853 to July 1854, more than 800 such simple wooden houses had been constructed next to Guangdong Road and Fujian Road in the British settlement. By the end of 1863, there were already 8,740 houses built in a similar way.²² But because these simple wood-board houses were technically inflammable and unsafe, the municipal council prohibited further construction after 1870.

The early shikumen house (1870s–1910s)

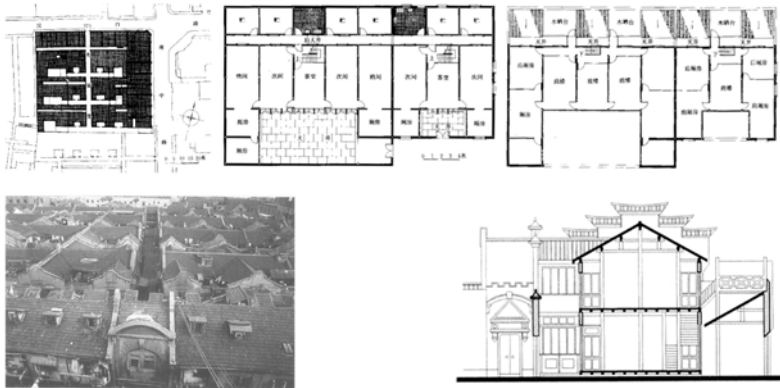
After the banning of the simple wooden houses, a more formal and durable dwelling form appeared, which is commonly categorised and named as the 'early *Shikumen* house'. Mostly built in the late nineteenth century, with a few built in the early twentieth century, these housing estates were concentrated within the early British and French settlements.²³ Because many of them have been demolished or largely altered in later urban transformation, their basic images may only be reconstructed from drawings and photographs recorded

in previous surveys and researches, in which some basic features can be identified.²⁴

An average size of each housing unit plot is three bays (3.6 to 4.2 metres each bay) in width, and about 16 metres in depth, that occupies an area of about 200 square metres. In the middle of the front exterior wall that has a height of 5.4 metres, a 1.5 metre wide and 2.5 metre high front gate is positioned, a stone frame in which hardwood doors are encased. All major rooms are placed around the front courtyard in a symmetrical way, where the main hall and the side halls are located. The staircase is often located behind the main hall that connects the ground floor and the upper floor, which together compose the primary part of the house. At the back, a row of auxiliary rooms are arranged with a depth of 3 to 4 metres, separated from the main part by a narrow back courtyard

about 1.2 to 1.5 metres in depth only. Above the single-storey auxiliary rooms, a wooden terrace is usually constructed that can be accessed via the staircase. Five-bay or even seven-bay *shikumen* houses were also found in early *shikumen* neighbourhoods, which were built for larger wealthy families, which could occupy an area of 400 to 600 square metres. At the same time, some double-bay units were used to match the plot site in the most economical way. One example was *Zhaofuli*, an early *shikumen* neighbourhood built in 1914, located at the corner of two major streets in the British Settlement. The neighbourhood occupied an area of 0.43 hectares and was comprised of nine three-bay units, three five-bay units, and twenty-four units of shop houses along the streets, including the two units crossing over the main neighbourhood entrances (Fig. 7).

Figure 7. Example of an early *shikumen* neighbourhood, *Zhaofuli*, built in 1914. Currently its eastern half has been replaced by a new office-shop block, only the western half remaining. (Source: site and floor plans from Shen Hua, 1993; image and section from Lv Junhua, 2001.)



Because of limited land and finance, the early *shikumen* housing neighbourhood was rather small in scale compared to the later *shikumen* neighbourhood. The numbers of housing unit per row ranged from one to five or six, with a total of around thirty units per neighbourhood, including the shop houses built along the public street. Most units could only be accessed via internal alleys except for the shop house units, accessed directly from the street. Another obvious and unique feature was the uniform front gate. Built in the same materials, same colours, same sizes, and same styles, all housing units within the same neighbourhood were marked with this small collective image, based on which the new term '*shi-ku-men* (stone gate door)' was spread among the population.

Such a combination of conventional housing layout and densely organised neighbourhood plan was not accidental, but was a rational and natural result of its historical context. For foreign investors and developers, who simply moved into this new business and had little knowledge of housing construction, the best option was to stick to the economic row-house layout that they were familiar with, while leaving freedom to the native builders to construct the house based on their own knowledge and experience. In short, *shikumen* housing seemed to be a 'perfect' match to satisfy nostalgia for traditional Chinese living and the demand for modern urban dwelling with great concern for economy. Chinese families who had just given up the bygone way of life and tried to start a new life in a modern city welcomed such a type. For them, it was then possible to live in a bustling city, enjoying the convenience of new urban infrastruc-

ture and facilities, and meanwhile finding some comfort and tranquillity at home behind the heavy gate and high walls.

The late shikumen house (1910s–1930s)

From the beginning of the twentieth century, the property sector in Shanghai started to grow even more rapidly with abundant capital inflow from major western powers. In addition to those aforementioned big corporations, new property dealers had sprung up like mushrooms. Among them, the Hardoon Corporation, founded in 1901, and the China Realty Company, founded in 1902, were the most influential at that time. Between the 1910s and the 1930s, and mostly in the decade of the 1920s, urban houses were developed on an unprecedented scale following the westward expansion of both the International Settlement and the French Concession, and even spread into the walled Chinese City. Some significant changes also appeared in *lilong* houses, which were later classified as 'late *shikumen* houses'.

In the new unit plan, the early three-bay or five-bay forms were replaced by the single-bay and two-bay division in most cases. An attic space was added in the front part of the unit while another floor was added above the kitchen and the service rooms at the back. These extra spaces were almost without exception sublet by the first tenant of the house owners in order to make extra income, and hence became temporary shelters for poorer families, individual artists, literati and students. Such changes should be understood in the context of changing market demands caused by: 1) a rise in small- and middle-sized families in the city's social

demographic structure; 2) a continuous rise in land value which led to an increase in house price for either purchase or rent; 3) the fact that average households were not able to afford large-sized housing but needed smaller sizes. Therefore, two-bay and single-bay units became popular.

At the neighbourhood level, the first change was the sharp increase in scale. Compared to the early *shikumen* houses ranging from ten to thirty units in each neighbourhood, later *shikumen* houses were developed at a much bigger scale with often hundreds of units. For example, *Siwenli*, built between 1914 and 1921, was the biggest *lilong* neighbourhood ever developed in history, containing 664 house units on 3.21 hectares. Consequently, the distinction between the general lane and the sub-lane also became clearer: all the internal traffic paths that used to be pedestrian only were widened, providing better ventilation and lighting as well as the possibility of vehicular access, at least in the general lane.

Structurally, brick walling became the major load bearer together with wooden roof trusses, replacing the previous free-standing wooden structure. New building techniques were used partly, such as reinforced concrete structure in the first floors of auxiliary rooms. Changes were also obvious in materials and details. The stone frame of the front gate was often replaced by brickwork. The gable-end in the traditional form of *Matou-qiang* or *Guanyin-dou* featured seldom. Machine-made tiles replaced traditional black tiles for the roof. Instead of being whitewashed with lime, exterior walls were often finished in clean brickwork of grey or red colours. More western ornamental

patterns appeared in gate, door and window frames (Fig. 8).

These changes should also be perceived in the context of provision. In these relatively peaceful and stable years both inside China and around the world, urban economy and development were booming, attracting more in-flow capital and population. More and more developers were confident and anxious to invest as much as possible in each project with their accumulated capital in the hope of a bigger profit in return.

The New-style lilong house (1910s–1940s)

Almost at the same time, another type of housing was also constructed in Shanghai. Most of this was built in scales from twelve units to more than a hundred, mostly located in the western part of the foreign settlements. Although many still followed a neighbourhood structure similar to the *shikumen* houses, some important features distinguished them from previous models.

Both brick walls and reinforced concrete structures were used in the load-bearing system. A three-storey height was common among these houses with a new structure. Bricks were mostly machine made, or of good quality made by the conventional method. Limestone mortar replaced the traditional mixture of limestone and clay. Steel also became a popular material mostly used in window frames and railings. The most obvious feature was the disappearance of the *shikumen* – the front gate at the entrance of each unit. Instead, an off-centre gate with iron bars or low concrete walls was installed. An open or semi-open green space and a side entry path replaced the formerly enclosed front courtyard.

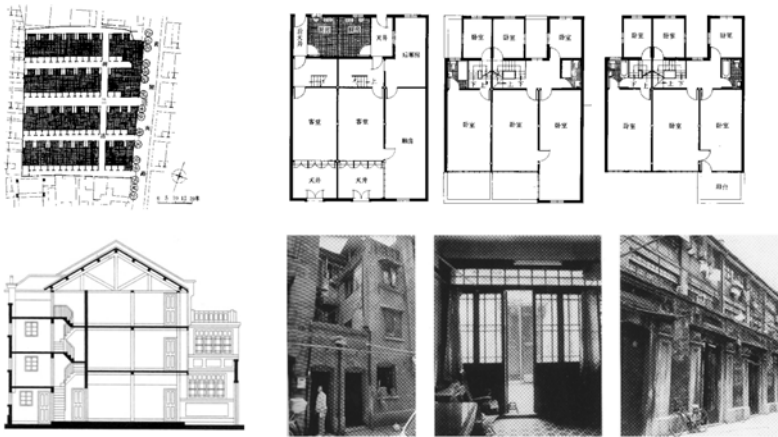


Figure 8. Example of a late *shikumen* neighbourhood, *Meilanfang*, built in 1930. (Source: plans from Shen Hua, 1993; section and images from Lv Junhua, 2001.)

In other words, the former front courtyard, a multifunctional as well as figurative space of the conventional dwelling was replaced by a front garden for the single purpose of gardening. The interior space of each unit was more clearly and firmly divided according to the different activity it was meant for – such as an entrance hall, a living room, a dining room, a kitchen, a servant's room, bedrooms and bathrooms – showing a strong functional logic with less figurative concerns. Moreover, modern facilities were commonly introduced including gas, electricity, heating, and sanitary systems; some even had private garages. A chimney and fireplace also became common elements in such houses. Also, the lane between two rows of houses was widened to about five metres to allow

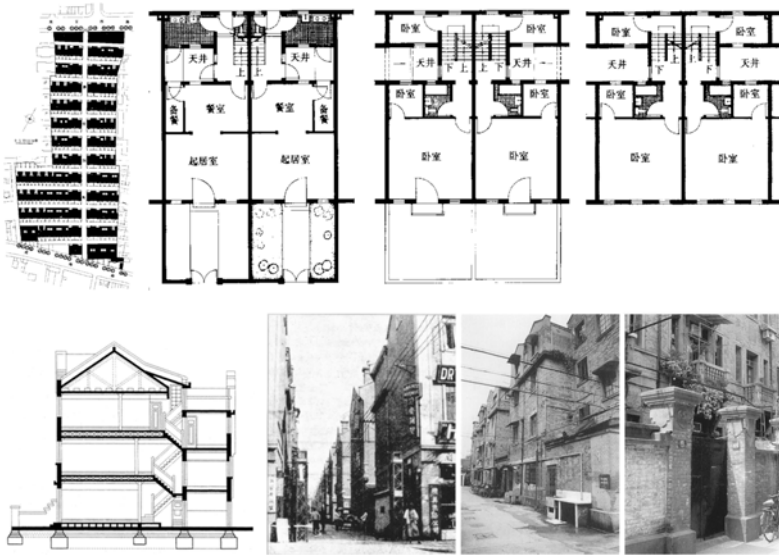
easy access for private cars and fire engines. Another obvious feature of the new-style *lilong* housing was the large reduction or complete disappearance of the shop houses that used to mark the boundary of the neighbourhood along the street (Fig. 9).

Based on the above-mentioned three models and two types of *lilong* housing which appeared during its development, further typo-morphological analyses are necessary to help better understanding of spatial impacts of this particular dwelling form.

Transformation in neighbourhood structure

It is commonly accepted that the reason why the above-mentioned housing models or types are all named *lilong* housing is mainly due to their simi-

Figure 9. Example of a New-style neighbourhood, *Jingan Bieshu*, built in 1928. (Source: plans from Shen Hua, 1993; section and images from Lv Junhua, 2001.)



larities in internal neighbourhood structure: except for some slight changes in dimension – such as the gradual increase in alley width to receive better sunlight and ventilation, to allow vehicular movement – several housing units are strictly lined up along narrow internal paths (branch alley), which are joined with one or two general paths (general alley) and then connected to the public street, forming a series of spatial hierarchies. As these aspects have been largely recorded and discussed elsewhere, attention here is given to another aspect

of neighbourhood structure – its relationship to the external urban context. Some differences can still be identified between *shikumen* and new-style neighbourhoods (Fig. 10).

Waipu-neili: a dual structure of the shikumen lilong neighbourhood

... *Lilong* refers to a regulated city formed by rows of houses, one storey, two storeys, three and even four storeys, either in one bay or two bays, of many alley houses. But different from

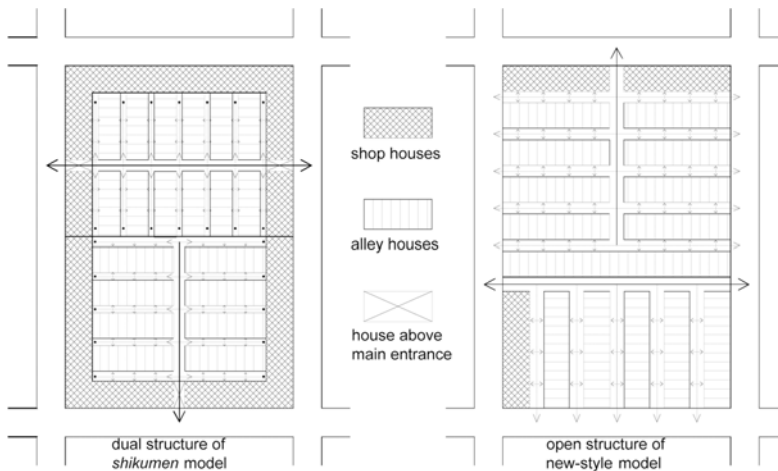


Figure 10. Two different *lilong* neighbourhood structure models (source, the author.)

those feudal city walls, the wall of this city is composed of shop houses opening to the street.

There are always shops that sell salt and soy sauces at the entrance to each *lilong* neighbourhood, where most likely you will also find a shoe-repair stall and a bookstall selling picture-story books.²⁵

What the above words describe is a typical *shikumen lilong* neighbourhood, which is composed of two basic components – a row of shop houses along the street, and several rows of *shikumen* houses standing behind that can be accessed only via a general path located in between the shop houses. Domestic scholars have used

'*wajpu* (shop houses outside) – *neili* (community living inside)' to describe such neighbourhood morphology.

Situated within the same urban block, several *lilong* neighbourhoods could be developed by different developers from the outset, completely separated by the high walls between them. Thus there is always a separating wall between two neighbourhoods next to each other, and in order to reach the other side one needs to take a long walk. This is rather different from the common layout in traditional residential quarters where most of them are connected. Here, partially due to the financial capabilities of the developers, and partially due to a particular security demand by dwellers

during those wartime periods, the connection between each neighbourhood to the street was reduced to a minimum – mostly with only one general alley opening to the urban street, joined with a few dead-end branch alleys. When such a structure was implemented in most urban blocks, as a result, urban public space was reduced to its minimum and a semi-public or a collective space was in turn provided on the neighbourhood level. We consider this an essential spatial feature that contributes to the formation of community-based living in *lilong* neighbourhoods, which differs a lot from the inward family-centered living in traditional courtyard houses.

In order to integrate these pocket-like residential neighbourhoods into a larger urban block, another housing type, the shop house, was adopted and built at the same time along the street. As a traditional housing type developed to meet the demand for increasing trading and commercial activities in cities, especially those in south China, shop houses were built along narrow streets. Normally the shop opens at the front part of the ground floor at street level, with workshops or auxiliary rooms at the back and the family living on the upper floor. Different from big centralised markets organised at certain times and places in the city, these shops form a fixed street market that serves mainly the nearby living quarters in their everyday life. In most cases, one shop occupies one bay, but some bigger ones may cover two and even more bays. From tailor shops to barbershops, from rice stores to grocery stores, from hostels to theatres, from restaurants to teahouses, all sorts of shop houses together form a colourful street façade, a buffer zone between

two domains – public space (the bustling street) at the front and a more private space (residential neighbourhood) at the back. Meanwhile, the main entrances appearing in the continuous shop strip from time to time, mark the threshold and the channel between the two domains. Initially to be controlled with doors, these were later more often guarded by one or two mobile yet position-fixed stalls, the owner of which usually belonged to the guarded neighbourhood. Therefore, there is a distinct contrast between the busy life of the public street, and a much quieter life behind. This 'dual structure' of *waipu-neili*, the outside linear around-block shop houses and the inside pocket-like residential neighbourhoods helped *shikumen* neighbourhoods to maintain their autonomy to a certain degree yet still to be integrated into a larger urban context.

Open structure in the new-style lilong neighbourhood

However, in the so-called new-style *lilong* neighbourhoods, such a dual structure becomes less recognisable. Although shop houses were still built along busy streets, in many cases, they were reduced to a minimum number while more rows of housing units were placed perpendicular to the street or some housing units faced onto the public street directly, with only the front garden as the buffer zone. Consequently, the widened general alley joins the public street in a more open way, in that no crossing-over houses can be found above the main gate. Often in estates that were built in the late 1930s and 1940s, whenever possible, more alleys were directly connected to the public street

so that the hierarchy between general alley and branch alley became less obvious. All these changes have suggested another type of dwelling pattern – a mono-residential quarter that pays less regard to urban integration but emphasises its own autonomy and freedom. As a result, its street profile became less continuous and was interrupted with different rhythms.

Such phenomena are to be explained in two ways. First, this new-style *lilong* housing was built mainly for the middle class and clerks of higher ranks, who were financially viable and mentally more anxious to try new ways of living. Secondly, this new-style housing was no longer built with traditional methods and plans, but produced in a more modern way, designed by architects and engineers, built by formal construction companies, both with more knowledge and understanding of modern techniques and living styles introduced from the West. Such an open dwelling environment presented by the new-style *lilong* housing became widely accepted and appreciated in the society of that particular time. In fact, even today, these houses are still popular among many Shanghainese.

Typological reading of the housing unit plans

From metaphoric layout to functional plans

From the development of *shikumen* housing described above, one can detect the persistence of a local dwelling tradition and its gradual transformation at the same time from its multi-bay model at an early stage (early *shikumen*) to the double-bay model and/or single-bay model at a later stage (late *shikumen*).

In both *shikumen* models, the main structure followed very much the traditional vernacular approach – a free-standing structure of wooden columns and beams enclosed with brick exterior walls. The basic plan and layout were very similar to the popular three-sided courtyard house in the afore-mentioned *jiangnan* area: 1) an overall dialectical relationship of several sets of dual-coordinators: the solid vs. the void, the front vs. the back, the major vs. the subordinate, the high vs. the low, etc.; 2) an hierarchic order in the arrangement of the above-mentioned coordinators along the central axis and associated with the front courtyard and the back courtyard respectively; 3) an emphasis on the metaphoric meaning of each room in the housing plan rather than a clarified functional definition of each room. By contrast, with few openings towards the outside and high exterior walls, the whole house was built in an inward manner. In short, many traditional metaphors and spatial coordinators were used to keep the inward family-based courtyard-centred dwelling pattern. Nevertheless, the gradual reduction in bays and increase in the floors and depth of each housing unit reflected an important demographic change in society – the size of each household became much smaller with an increasing percentage of nuclear families, conjugal families and even single-person families in household groupings different from conventional extended or joint families.

Contrastingly, new-style housing was a more functional-oriented and modernised type. In these housing plans, one could hardly find any of the traditional cosmological implications of spatial organisation in axisymmetric and dialectic articulation that

led to the previous vagueness and flexibility in functions and activities, and evenness and fluidity in space. Instead, following a different organisation of dwelling space based on Western rationality and logic, the house was divided in such a way that each room/area became associated with a specific function and activity so that space was thus fixed or solidified. Evidence can be found in the clear differentiation between kitchen, dining and living space on the ground floor, and in the well-defined front garden that replaced the previous open and multifunctional front courtyard that was smoothly connected to the main hall in *shikumen* houses, and in the installation of modern facilities like electricity, tap water, gas, lavatory and even garage. In short, this new housing type started to introduce some basic principles of modern dwelling to ordinary Chinese families (Fig. 11).

Evolution of the 'opening'

One important spatial transformation worth further discussion here is the different forms and meanings of the 'opening' in its relation to domestic activities. In both cases, similarities can be found in that: 1) a rather big and square 'opening' appears at the front of the plan in a close relationship to the living room (*tangwu*) and 2) a much smaller and narrower 'opening' appears at the back next to the kitchen and other auxiliary rooms. However, a closer look at their forms and meanings shows a rather large difference between them, especially the front 'opening'. Other than climatic concerns, more socio-cultural meanings can be read behind such forms.

In early *shikumen* houses, the front 'opening' refers to a 3m x 4m or 4m x 4m square paved with

stone slabs or cement between the front gate and the living room. Strongly enclosed from the outside by high walls, yet very open to the inside, the courtyard is used as a multi-functional space, where a number of activities may take place besides its transitional function, i.e. a secular space where children play and the elder and women members sit and chat on a daily base; a ritual space where family ceremonies and sacrifices take place on the right occasions. Through the use of full-length lattice doors around three sides of the front courtyard, a 'soft' partition that could either divide from (when closed) or connect to (when opened) the outside, a spatial continuity and fluidity between the exterior and the interior was firmly maintained. Apart from climatic and daylight considerations, the popularity of keeping such a front courtyard in late *shikumen* houses showed a clear link to the traditional courtyard dwelling concept.

Distinctively, another kind of 'opening' appeared in the new-style *lilong* house. High walls and front gates were replaced by a fenced front garden planted with trees, bushes or flowers. Such a semi-open space had its functions well defined: a front garden with a small path leading to the entry door into the house. Without full-length vertical partition doors, only a visual connection exists between the living room and the front garden. Although located at the same spot, the opening no longer serves as a multi-functional space, let alone its spiritual role of holding the house together. Moreover, it also blurs the boundary between the housing unit (the inside) and the alley (the outside), which indicated a more outward living pattern compared to the *shikumen* type.

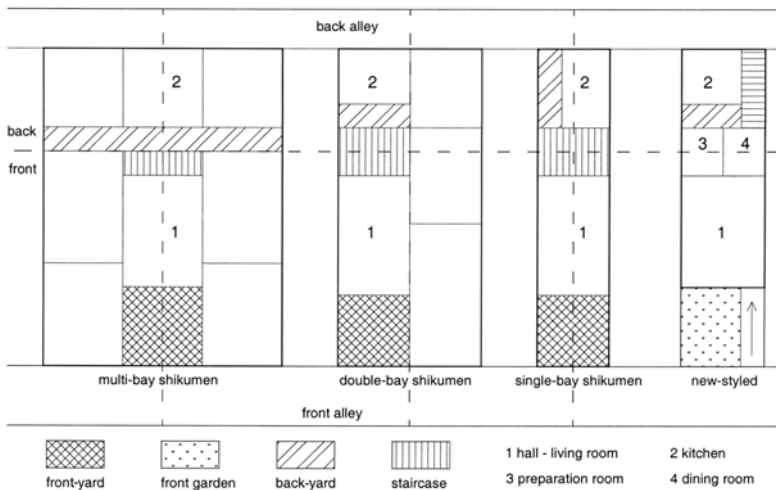


Figure 11. Typological models of *lilong* housing (source, the author).

In short, the roles of the front 'openings' were indeed quite different in that one was the centre of a private realm and the other was more integrated, in an ambiguous position between the private and public spheres.

Densification in *lilong* houses

Another important aspect of *lilong* typology is simultaneous densification due to continuing housing shortages and high rents. Families with less financial means had little choice and could only afford one room under the secondary rent system. Although all types of *lilong* houses were originally designed to accommodate one family per unit, it was common

to see one housing unit shared by several families. According to the 1937 SMC report, in the International Settlement where most *lilong* housing neighbourhoods were located, more than 86% of families lived in such a co-residing way in one house, with family numbers ranging from two to nine, with some extreme cases of one single-bay house accommodating as many as fifteen families. A concentration of four families, or twenty-four persons, per house was a norm in these neighbourhoods, which gave an average 2.8 square metres or 9.5 cubic metres per person.²⁶ Many houses were therefore remodelled to create more rooms and floor areas to accommodate more tenants. Based on surveys by

local scholars, a list of such reconstructions that were most commonly found in *lilong* houses, especially *shikumen* houses, can be identified as follows: 1) the living room was extended to engulf what was formerly the front courtyard; 2) the living room was divided into a front living room (*qian ketang*) and a back living room (*hou ketang*); 3) an additional room was created between the floor and ceiling of the back living room (*er ceng ge*); 4) like the living room, the bedroom on the second floor was divided into a front bedroom (*qianfang*) and a back bedroom (*houfang*); 5) an additional attic room was created by lowering the ceiling of the second floor (*san ceng ge*) (Fig. 12).

By such reconstructions, the floor area of a single-bay *lilong* house might be increased by 50 percent, and a house originally designed for one family of no more than eight or nine people could then accommodate four to nine families with fifteen to twenty people.²⁷ A local farce, 'The Seventy-Two Tenants', played by two well-known local comic actors, was so well received that the title became a synonym for sharing rooms in a crowded *lilong* house in Shanghai. One direct result of such densification and reconstruction was the intensive use of the alley space that later became an unique feature and, to a great extent, a common feature of *lilong* dwelling.

Alley-living: the essence of *lilong* dwelling

Among the locals, *lilong* has another popular alternative name, *long-tang*, meaning alley (as the) living hall, which further emphasises the most important feature of such neighbourhoods, alley-living.

In accordance with the traditional family-centred dwelling, alleys within a dwelling quarter were mostly used as a public traffic space, while transitional spaces between public and private realms were designed and provided within the family-based courtyard compound – the entry route between the front gate and the screen wall. Even at the time when courtyard houses were co-resided by several families, it was the central courtyard which played the role of semi-public and multi-functional space.

Whereas in *lilong* neighbourhoods, branch alleys formed between two rows of *lilong* housing performed this transitional role. Besides its traffic function, it became a shared living room for the community dwelling along it.²⁸ In Mu Mutian's essay, he also recorded alley life, strange to the eyes of an outsider:

After you wake up the next morning, you feel in another world. Looking out from the rear door, you will find one or two red-paint night-stalls lying outside each house. Vegetable sellers are wandering in the alley. Housewives or female servants are bargaining with pedlars in a rather flirting way.²⁹

Another of the literati, Feng Zikai (1898–1975), managed to record alley life in a more vivid way.³⁰ In his well-known cartoon works, we may learn about the common activities that happened on a daily basis (Fig. 13).

In the decades after Mu's visit, the alley has remained the place where people greet and chat, where children play games and the elderly play chess matches, where pedlars conduct small business, where women do their laundry, etc. Some of



Figure 12. Densification in *lilong* housing. a) Floor plans after densification (source: D. Louise Morris, 1994). b) Front section after densification (source: sketch by the author).

Figure 13. Four sketches by Feng Zikai of Shanghai's alley life: clockwise from top left: lowering a basket down to the alley to purchase *zong-zi* from a hawker (1923–1925); a *hun-tun* seller with his mobile kitchen on his shoulder pole (1934); a pedlar selling straw mats, a necessity for every family in the hot summer (1934); a street barber cleaning his customer's ears, an after-haircut treat provided by the barber as a courtesy (1934). (Source: Lu Hanchao, 1999, originally from Feng Zikai, Feng Zikai Wenji)



these activities were certainly not considered in the original design of the *lilong*, but were gradually introduced in the practice of everyday life within the community.

A local writer, Shen Shanzeng, has named this special way of living as 'life in the alley' (*long-tang ren-sheng*). As a person who spent much of his youth in *lilong* neighbourhoods, Shen recalled such a life in a rather ambivalent manner. On the one hand, he ruthlessly points out its dark side:

family . . . life in the old *lilong* was short of doors and windows, being encroached upon by alley-living. . . . *Shikumen* is not suitable for

living not only because of its poor living facilities, but more importantly, because of the lack of necessary distance between family members within a family and between families. Intimacy can also be disturbing. . . . To grown-ups, the alley in the *lilong* is just a pathway, or a place where all kinds of rumours originate.

But on the other hand, Shen also admits the attractiveness of alley-living to certain people, like the children and the elderly who seem to enjoy the more intimate and blurred living pattern:

But to children and elders, . . . the *lilong* is an ideal place. Compared to those fully-equipped 'children's palaces' and 'elderly homes', the blankness of alley space in the *lilong* allows its participants to make full use of their imaginations with much fewer constraints. A child enjoys no less happiness in playing with his toy gun with his fellows after school than from an amusement park. An elder obtains no less joy by chatting in the alley than by going to a teahouse. *Lilong* life becomes poetic because of the creativeness of the children and the elders.³¹

Clearly, as a collective appropriation made by its dwellers under the pressure of typological transformation and especially densifying reconstruction, the alley is no longer a simple narrow traffic path, but has become a shared 'living room' of the whole community next to it, an ambiguous space that is so flexible and interchangeable in mediating the private and the public, the 'inside' and the 'outside' (Fig. 14).

Conclusion

Confronted with an over-concentrated and over-congested urban population in the fast-urbanising

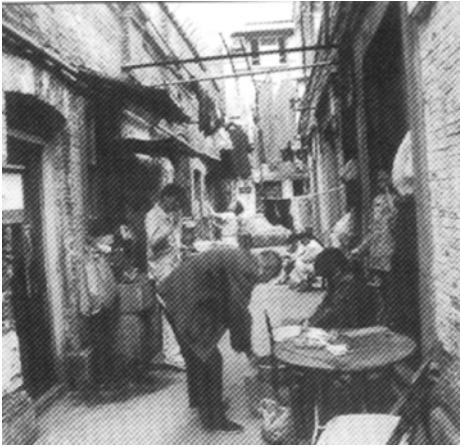


Figure 14. More recent portraits of alley-living, clock-wise from top left: the setting of the table, the chair and the old man suggests a frequent and stable activity in the alley (source: Luo Xiaowei, 2002); a place for casual chatting, also for bicycle parking (source: Lv Junhua, 2001); an ordinary afternoon in the branch alley of Jianye-li (source: photograph by the author, 2003); housewives purchasing from a food peddler on a bicycle in the rain (source: *Shanghai Pictorial*, 1985, no. 5).



Shanghai of a century ago, *lilong* housing was developed as a response. It is important to understand that *lilong*, as a hybrid dwelling form, initially built by the foreign developers and sold or rented to the local Chinese for profit, was a product of a natural process brought about by the 'market', which met needs from both the supply and the demand sides.

Unlike conventional land transfer and housing tenants/sales activities conducted in self-contained and self-initiated ways for many centuries, the development of *lilong* was, first of all, conceived within the production/consumption cycle, a great opportunity for profit making, a vision first captured and realised by foreign businessmen and corporations who were *de facto* the managers and rulers of Shanghai for almost a century (1840s–1940s). Two key factors may be identified that brought this new dwelling form into being and acted as both socio-economic incitements and restraints for its further development. One is the establishment and expansion of foreign settlements as an 'extra-territoriality', which provided a 'safe and promising land' for urban living in contrast with the nation-wide rural depression in the turmoil of an age of frequent wars and natural disasters. The other is the influx of a large population resulting from successive domestic rural-to-urban migration, pouring into the foreign settlements, later the core of the city, for a better life or merely for subsistence, which had no choice but to reside in the *lilong* neighbourhoods and became the majority of the City's inhabitants.

Architecturally, the *lilong* offered a new settlement pattern with two different housing types and various

models. Starting as a stacked compact version of conventional dwelling form, it was gradually rationalised and modernised in its housing typology, from *shikumen* to new-style. According to the original housing plans: 1) it provided the independence of each household on a defined plot within a living space from earth to sky, with much of the advantage of a courtyard house or a villa house; 2) a row-house-like general plan optimised use of the land at a reduced cost; 3) joining several house units together also formed a hard-to-achieve close neighbourhood concept. Hence the spatial essence of the *lilong* lies in the interiorisation of exterior space that allowed its most effective use, and also kept it on a humanised scale. At an urban level, while the dual structure of the *shikumen* neighbourhood managed to modulate the street pattern and shaped the general character of Shanghai's urban form, the structure of the new-style neighbourhood, to a certain degree, interrupted the conventional continuity of the street profile and urban form, and introduced a more open and free rhythm. In confronting extreme housing shortages, the densification method of seeking the maximum use of space was in fact a reflection of the mass wisdom rooted in and based on everyday life practice, which may serve as a potential resource and inspiration for future design: for instance, the unique way of using alley space – the 'interiorisation' of exterior space.

Socio-culturally, the *lilong* was an ideal vehicle for regrouping an uprooted population during turbulent years. It helped to organise a new social network among the middle and lower-middle classes of the urban population, to foster in this major group of people a strong identity that

became embedded in this manner of *lilong* dwelling. What the *lilong* has represented is a more outward community-based alley-centred living, a social network established and developed through daily life in social-spatial interactions for decades. As many people like to put it, if there were no *lilong*, there would be neither Shanghai nor Shanghainese. A recent survey has indicated that, despite the poor physical conditions of *lilong* houses, especially *shikumen* houses, the majority of *lilong* dwellers rather choose to have 'on-site unit-upgrading' than to be relocated in a new housing site on the city periphery. For them, 'to live in the *lilong* is very important'. Among them, many elders, who have spent most of their past lives living there, are used to such a close community atmosphere; young to middle-aged people with lower social status also rely a lot on their locational advantages where more working opportunities can be found close by so that less time and money are spent on travel. Such a choice is 'not merely about getting a completed unit-layout or an increase of floor area, but also to protect their own interests and benefits'.³²

The essence of *lilong* lies not only in the architectural integration between the local and foreign dwelling cultures, but also in how it resolved all kinds of conflicts within each small but expensive land plot. Its forms and shapes certainly had their historical roots, but what made it different from traditional Chinese urban housing was mainly its commodity feature – an important transition from self-planned, self-contained and self-built housing to an unified collective mass housing development that involved more actors in the process, such as

developers and designers. The strong socio-economic feature, based on capitalist speculation on 'land value' and 'rent gap' introduced by foreign developers to Shanghai, defined *lilong* housing as the first commodity housing type in Chinese dwelling history.

Some people may have enjoyed *lilong* dwelling and still cherish it, while others feel much annoyed by its over intimacy and are anxious to move out. Despite its poor maintenance all these years, the *lilong* has always retained an irreplaceable role in shaping the identity of the city as the primary living space, the roost of the majority of its citizens. It is also in this sense that the *lilong* has been considered a city legacy, a new tradition in the urban dwelling history of Shanghai. Ironically, most of the *lilong* had survived through wartime in the 1930s–1940s, and also survived the Cultural Revolution (1966–1976), when any traditional and capitalist elements were supposed to be removed, but was unable to stand up to the economic forces driven by the trends towards globalisation and internationalisation since the beginning of the 1990s. Maybe history is repeating itself: a new 'foreign settlement' has been quickly developed, known as Pudong, on the east side of the Huangpu river, where skyscrapers and high-tech industrial parks have been erected one after another to attract the headquarters of MNCs. For the same reason of land speculation, the *lilong* probably won't escape the fate of its predecessor – the three-sided courtyard houses – and will be transformed again into some other new dwelling form to accommodate a new wave of domestic as well as international migration to the city.

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Notes

In this paper, texts quoted from the original Chinese are all translated by the Author.

1. The term is borrowed from the title of Lu Hanchao's recent book: *Beyond the Neon Light: Everyday Shanghai in the Early Twentieth Century* (Berkeley, Los Angeles, London, University of California Press, 1999).
2. Xu Zhongshu. *Hanyu da chidian (The Great Chinese Vocabulary Dictionary)* (Hubei Dictionary Press; Sichuan Dictionary Press, 1992), p. 217; p. 1531.
3. In an official classification made by the Housing and Land Bureau after 1949, five housing types are recognised including two *lilong* types – old *lilong* and new *lilong*. In Shanghai *lilong* minju, Shen Hua proposed to define *lilong* as a new vernacular housing form that includes five types: early *shikumen*, late *shikumen*, new-style *lilong*, garden *lilong* and apartment *lilong*. In this paper, however, attention is given to the first three housing types and the two kinds of neighbourhoods they formed – *shikumen* and New-style, corresponding to the official classification based on neighbourhood structure without neglecting the differences in housing unit plans.
4. This refers to the lower branches of the Yangzi River region, including today's southern parts of Anhui and Jiangsu Provinces as well as the northern part of Zhejiang Province.
5. 'The urban-rural continuum' has been widely accepted as one of the key features of rural-urban relations in traditional China. G. William Skinner and his colleagues first presented it in the monumental volume, *The City in Late Imperial China* (Stanford, Stanford University Press, 1977).
6. Lu Hanchao, 'Urban Superiority, Modernity and Local Identity – a Think Piece on the Case of Shanghai'. In: David Faure, Liu Taotao (eds.) *Town and Country in China: identity and perception* (Palgrave, 2002), p. 126.
7. Max Weber, *The City* (New York, The Free Press, 1959), pp. 81–82.
8. Lu Hanchao, 2002, op. cit., p.127.
9. Sima Qian, *Shiji (Historical Records)*.
10. Gu Yanwu, *Ri zhi lu (Records of Knowledge Gained Day by Day)* (Shanghai, Wanyou wenku).
11. Completed by the talented young northern Song Dynasty painter Wang Ximeng (1096–1119) at the age of eighteen, the painting has been highly appreciated for its artistic achievement in art history. According to Nie Chongzheng, it 'shows Wang Ximeng's ability to handle a grand conception and at the same time paint meticulous detail with skill and precision' (translated by Zhang Maijian at <http://www.chineseliterature.com.cn/artsalon/wangximeng.htm>) originally published in: *Chinese Literature*, 1986, no. 3. However, its potential value in the study of the traditional dwelling environment, has not yet been fully recognised and studied. The original painting is made on a 51.5 cm high and 1191.5 cm long silk hand scroll, in the collection of the Imperial Palace Museum in Beijing.
12. This is an official rank for the administrative head of cities like Shanghai during the Qing Dynasty.

13. Despite the slightly differing opinions among contemporary scholars over when the first demarcation of the British Settlement was officially made, its location and size were clear: an area of about fifty-five hectares on the west bank of the Huangpu River, to the north of the Chinese walled city, south of the Suzhou Creek, and bounded by the Nicheng Canal in the west (A in Figure 6).
14. Bounded by the walled Chinese city in the south and the newly created British Settlement in the north, it covered an area of about sixty-six hectares (1 in Figure 6).
15. Its official boundary was later settled by the American consul George Frederick Seward and the Shanghai *Daotai* Huang Fang in 1863, based on the natural growth of the settlement covering an area of about two hundred hectares (C in Figure 6).
16. Lu Hanchao, 1999, *op. cit.*, p. 29.
17. Zou Yiren, *Jiu Shanghai renkou bianqian de yanjiu* (*Research on population change in old Shanghai*) (Shanghai, Shanghai People's Press, 1980), pp. 90–91.
18. *Ibid.*
19. The original text is from: Sir Rutherford Alcock, *Capital of the Tycoon: a narrative of a three years' residence in Japan* (New York, Harper and Brothers Publishers, 1863). Quoted from Lu Hanchao, 1999, *op. cit.*, p. 34.
20. During the decades of foreign settlement expansion, the Chinese district was also developed, but in a rather scattered way. In addition to the original walled city, a northern area called Zhabei and a southern area called Nandao were developed respectively. However, the westward expansion of the foreign settlements had caused the separation of the Chinese districts, making any overall planning impossible.
21. The same Edwin Smith once stated: 'my goal is to make a profit in the shortest time possible by leasing land to the Chinese, or by building and lending houses to the Chinese at a 30 to 40 percent profit rate. If this is the best way for me to collect money, we don't have other choices'. Quote from Xu Gongsu, Qiu Jinzhang, *Shanghai gonggong zujie zhidu* (*The Foreign Settlement System in Shanghai*) (Shanghai People's Press, 1980).
22. Wu Jiang, *Shanghai bainian jianzhushi* (*The History of Shanghai Architecture 1840–1949*) (Tongji University Press, 1997), p. 42.
23. The area is bounded by the Huangpu River to the east, Nichengbin (now Xizang Road) to the west, the Suzhou Creek to the north, and the old Chinese city wall to the south. Later, such neighbourhoods were also found inside and out of the walled Chinese city.
24. Two major works on *lilong* published by local academies have served as foundations for later researches. Wang Shaozhou, Chen Zhimin, *Lilong Jianzhu* (*lilong Architecture*) (Shanghai, Shanghai Scientific and Technology Press, 1987). Shen Hua, ed., *Shanghai lilong minju* (*Lilong Folk Dwelling in Shanghai*) (Beijing, China Architecture & Building Industry Press, 1993).
25. This is a sketch made by an earlier writer Mu Mutian (1900–1971), who grew up in north China and sojourned in Shanghai from the

- 1920s. The author has translated these paragraphs as well as a few more in later texts. The original text can be referred to: Mu Mutian, *Longtang: Shanghai difang shenghuo sumial zhi er* (*Sketches on Shanghai Local Life II*). Quoted from: Xing Ping, *Cong Shanghai faxian lishi – xiandaihua jincheng zhong de shanghai ren jiqi shehui shenghuo* (*Discovering History from Shanghai – Shanghainese and Their Social Life in the Process of Modernisation*) (Shanghai People's Press, 1996), p. 426.
26. 'Report of the Housing Committee, 1936–1937'. In: *Municipal Gazette of The Council for the Foreign Settlement of Shanghai*, Vol. 30, No. 1653. p. 98.
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 28. In reality, each alley is more attached to households who have their shared entrances and kitchens at the back.
 29. Mu Mutian, *op. cit.*, p. 426.
 30. Feng Zikai is considered the founder of modern cartooning in China. According to Barmé, as one of the most gifted and important artists to emerge from the politically tumultuous decades of the 1920s and 1930s, much of his writing and painting was rooted in a philosophy of self-expression. While, in Jeffrey Wasserstrom's view, a mixture of traditionalist and progressive concern is reflected through Feng's works. More details on the artist can be found in: Geremie R. Barmé, *An Artistic Exile: A Life of Feng Zikai (1898–1975)* (University of California Press, 2002).
 31. Shen Shanzeng, 'Longtang rensheng' ('Alley life', in: *Shanghai Ren* (*Shanghai People*) (Zhejiang Peoples' Press, 1996), pp. 156–157, 160).
 32. Fan Wenbing, *Shanghai lilong de baohu yu gengxin* (*Conservation and Renewal of Alley Housing in Shanghai*), (doct. dissert.) (Shanghai, Tongji University, 2001), p. 116.

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