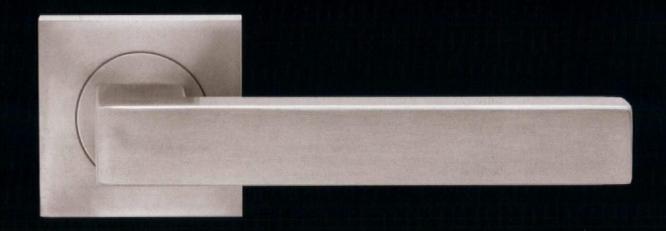


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Editorial view

Antoine Vaudover

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'Gehry describes his one direct experience of designing with a computer as excruciating and like being trapped in a vice of pain'

Tim Abrahams, p44

Thom Mayne and Steven Holl are sort-of allies, like old lovers who aren't together any more'

Peter Cook, p62

'I was depressed.
So I went into
psychoanalysis,
and began to learn
the difference between
living in your head
and living in your body
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'Sydney Smith gave the secular definition of heaven as "eating foie gras to the sound of trumpets", to which an atheist architect added "but only in the nave of Notre Dame"

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'Gropius, ever the gentleman, allowed himself to be caught with a prostitute to expedite their divorce'

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Cover: detail of Wet Lands plan by Smout Allen, a project exploring the possibility of an architecture geared to ecological processes like rainbows, mirages, flooding and evaporation. See p62 for more details

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Fredy Massad and Alicia Guerrero Yeste founded the bizarrely-named ¿btbW/Architecture in 1996. They look back at the life and work of Clorindo Testa in Overview

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Editorial view

Redefining the ambivalent relationship between architectural representation and content

This special issue reconsiders the relationship between architecture and representation. Representation used to be thought of as simply drawing, but engorged by the possibilities of the digital age, it now encompasses many other aspects, such as montage, renders, modelling and films. Thirty years ago, James Stirling's hand-drawn axonometrics were the height of aspirational innovation; now a new generation of digital natives effortlessly mainlines into the latest software packages.

Throughout the modern era. changes in modes of perception coupled with the increased sophistication of representational techniques have refined and redefined architecture. Yet this complex synergy is rarely discussed, thus ignoring a critical and eloquent dimension of the architectural thought process. The epithet 'paper architect' is freighted with condescension. But as Nicholas Olsberg writes, 'Drawing is an essential and persistent element in architectural culture and a means of portraying what John Hejduk called its "state of mind" (p36). Drawing encapsulates the elusive, synaptic spark between mind, eye and hand, whether that hand is holding a pencil or a mouse. For Peter Eisenman 'Drawing is a way of thinking... I'm not trying to represent something; I'm trying to make it real. And the only way it can be real is through my drawings' (p80).

New approaches to representation often presage more profound epochal shifts. 'There is always a historical moment when techniques and methodology influence culture and the culture argues for a new body of work', says Hernan Diaz Alonso (p52). An obvious example is Zaha Hadid's early Suprematist paintings. Produced without the midwifery of software, they were a genuinely new way of thinking about architecture. Likewise, Frank Gehry's experiments with carved models, which were then digitised, marked another detour. Parametric modelling is simply the latest phase in the evolving rapport between tools and content, elevating design to a hitherto unimaginable level of digital cruise control.

However, once new techniques are more widely disseminated, they invariably become formulaic. The radical becomes the norm and the distracting search for novelty begins again. And now that architects can draw on a much wider repertoire of tools to assist them in devising new and more complex forms, is such licence an unequivocally good thing? Can they resist the lure of technique in order to sustain a wider sense of enquiry and inculcate a new point of view? 'I don't agree that a concept should exist simply because the tool allows it,' argues Marcelo Spina. 'The architect is delivering on a set of core beliefs. Any new image should belong to the a priori belief system that precedes the enabling capacity of the tools' (p52). Beyond its crucial role as an incubator of ideas, representation for its own sake ultimately disconnects architecture from its core purpose, which is to build. As Manfredo Tafuri once told Peter Eisenman: 'You have to build, because ideas that are not built are simply ideas that are not built'.

Catherine Slessor, Editor

Overview

ROQUEBRUNE, FRANCE

A scandal of French neglect

It is incomprehensible that Eileen Gray's legendary love nest has been left to languish by the French authorities, says an outraged Michael Webb



The shoddy fate of Eileen Gray's E.1027 house in Roquebrune-Cap-Martin, victim of flawed and half-hearted restoration attempts

Eileen Gray would be spinning in her grave at Père Lachaise if she could see her first and best house as it is today. In 1929, she completed E.1027, a compact white villa perched on the rocks of Roquebrune-Cap-Martin, looking out to the harbour of Monaco. Vandalised and abandoned in the late 1990s. it was bought by an agency of the French government and declared a historic monument in 2000. Architect Renaud Barrès, who had written his thesis on the house, prepared a detailed restoration plan, and was joined by Burkhardt Rukscheio, an architect who won a Europa Nostra award for his restoration of Adolf Loos buildings.

They withdrew when Pierre-Antoine Gatier, chief architect for historic monuments in the region, asserted his right to restore the house even though he had had no experience with modern buildings. He spent 600,000 euros over six years on an incomplete restoration that outside experts consider seriously flawed. For the past four years the house has been shuttered, and, but for a few token visits, closed to the public. Metalwork is rusting, cracks have reappeared in the walls, and there has been little maintenance.

It's a tragic fate for a unique icon of Modernism, a total work

of art that Eileen Gray created over three years as a refuge from Paris that she planned to share with her mentor and lover, Jean Badovici. E.1027 was a code for their names, and though she accepted his advice on technical issues, the design was hers - yet contemporaries were reluctant to believe it. In the same years, Charlotte Perriand applied for a job with Le Corbusier, and was told, 'mademoiselle, we don't embroider cushions here'. The master displayed the same arrogance in 1938-39 when he was staying at E.1027 as a guest of Badovici, and painted eight bare walls with gaudy murals. Gray was outraged and banished him. He later built Le Cabanon on a neighbouring plot as his own summer retreat, and died while swimming at the beach below in 1965.

Like Perriand, and Lilly Reich who worked with Mies, Gray humanised Modernism, emphasising liveability over abstract principles. Exterior architecture seems to have interested avant-garde architects at the expense of the interior,' she wrote in 1929. 'As though a house ought to be conceived more for the pleasure of the eyes than for the comfort of the inhabitants.'

In later years she observed that, 'the poverty of modern architecture stems from the atrophy of sensuality'. As pictured and described in a special 1929 edition of Badovici's magazine, L'Architecture Vivante,* the house is sensual yet rigorous. It follows Le Corbusier's five points a crisp white block, raised on pilotis, with a flat roof, horizontal windows and an open plan - but it goes much further. The furnishings and many built-ins that Gray designed for the house are all configured and located for convenience. Subtle accents of blue refer to the Mediterranean, which is framed by sailcloth awnings. Rooms open onto terraces or the garden, and screen walls articulate the main salon, concealing the entry and a shower. Witty touches abound: a lifebelt suspended beneath the pipe railing balustrade, as though this were a boat; and stencilled injunctions - 'entrez lentement' and 'défense de rire'.

The house was a portrait of its creator and the life she meant to live there. It is a cousin of the Rietveld-Schröder house in Utrecht, the Eameses house-studio in Los Angeles, and other personalised dwellings, more than the universal statements other Modernists were erecting.

Why has such a remarkable achievement been so shabbily treated? Everyone concerned had the best of intentions.



E.1027: a unique icon of Modernism

The property was purchased by the Conservatoire du Littoral, which preserves 12 per cent of the French coastline from the kind of crass development that has disfigured much of the Côte d'Azur. They delegated ownership to the Commune of Roquebrune-Cap-Martin, which paid its share. The mayor wanted Barrès and Rukscheio to do the restoration, holistically and at a fair price, but was pressured to accept the choice of the Ministry of Culture, which demanded its own appointee in return for half the funding.

Gatier wanted to honour Eileen Gray, declaring that 'my job is to conserve what has survived, rather than restore it - a minimalist intervention'. Unfortunately, he has strayed from that promise. Original glass and light switches have been replaced by modern versions; exterior stairs and pipe rails have been reconstructed in the wrong dimensions. Gatier painted a wall of the salon in colours that may have been tested by Gray but do not appear in the 1929 photos. Several modern restoration experts agree with the critical report prepared by Barrès and Rukscheio. John Allan of Avanti Architects finds 'disturbing evidence of a project that was poorly conceived and inadequately executed'. The smaller rooms and garden are still unrestored, and the interior is bare. Useful progress has been made - the house is in much better shape than it was in 1999 - but Gray's masterwork demands a level of authenticity and meticulous detailing that is presently missing.

From the start, there has been an absence of leadership and supervision. The steering committee of 10 state and local representatives was unable to question Gatier's choices or review the quality of workmanship. The Commune was given a management contract through 2010, but lacked the funds, staff and expertise to exercise that responsibility.

The contract has not yet been renewed and the Commune is being advised to retain ownership but pass the burden of management to a non-profit foundation. This might grow out of the local Association Étoiles de Mer that was established in the 1990s to safeguard the entire site even before it was purchased by the state.

Pressure for action is building. The Fondation Le Corbusier is a strong advocate for change. Docomomo has urged action and offered its help. Le Monde published a scathing article. An Irish filmmaker, Mary McGuckian, will incorporate the house in The Price of Desire, her feature on Gray, and that should stir public interest in this sleeping beauty. It's essential that a responsible entity be entrusted with the task of raising funds to maintain and administer E.1027, correcting errors and completing restoration, while training docents to conduct tours of the site. Gray, and her countless admirers, deserve no less.

* Republished by Éditions Imbernon, 2006. Peter Adam's splendid biography Eileen Gray, Architect/Designer (Harry Abrams, rev ed, 2000) puts E.1027 and Gray's later houses in the context of her life and work

ZANZIBAR, TANZANIA

Disturbing development

Rafael Marks

The island of Zanzibar, 22 miles off the coast of Tanzania in the middle of the Indian Ocean, conjures up romantic images of palm-fringed beaches, exotic spices and Arab bazaars. Once a sleepy backwater, it is now feted in the tourist literature as a charming and mysterious place still to be discovered by the discerning traveller.

At the heart of the island is Stone Town, an architectural milieu that reflects the island's history as a melting pot of the different cultures and traditions of the Indian Ocean. A site of settlement from at least the

15th century, the town was built primarily between the 19th and early 20th centuries, combining elements of Omani, Indian, African and modern European building traditions into a unique hybrid mix. Arabic courtyard houses, long slender Indian 'shopfront' buildings and Swahili bungalows jostle for position along the narrow winding streets. The traditional restrained palette of heavy whitewashed limestone walls embellished with carved doors, windows and balconies, sits side by side with more modern materials of concrete, steel and glass.

Throughout its history, the town has had its fair share of trauma and change, including a bombardment by the British navy in 1896 and, more recently, the 1964 revolution, which saw the overthrow of the Sultan and his ruling elite. In the ensuing violence and confiscation of private properties, much of the urban population fled the island and the town lurched into a downward spiral of economic decline. Today, it is the site of newer struggles between the contradictory forces of global capital and local needs.

Since the 1990s the Zanzibar government has pursued an aggressive policy of liberal economics, spearheaded by

high-end tourism. Stone Town is at the centre of these efforts. in which conservation, tourism and the free market go hand-inhand, A Conservation and Development Plan, passed into law in 1994, signalled the start of this process. While wellintentioned, in reality it has had little effect in controlling the wave of development and change that the growing tourist industry has brought in its wake. Conservation and heritage have become smokescreens for the rampant exploitation of the town.

Much of the investment comes from foreign investors and little of the tourist economy trickles down to the local population. As parts of the town are privatised and transformed to cater to a tourist imaginary of a nostalgic past, much of the city remains untouched. Collapsing buildings, water and power shortages, accumulating rubbish, flooding, and other infrastructural problems remain the everyday experience of most people, causing increasing friction and discontent.

These issues have come to a head with a controversial land deal between the government and the Kempinski luxury hotel group. In exchange for US\$1.5 million, the Dubai-based company received a 99-year lease for a



The government of Zanzibar sells off the family silver: prime public seafront space

building and adjacent public open space along the seafront which they plan to develop into a five-star hotel and car park.

Mambo Msiige (meaning 'do not imitate' in Swahili) was until recently the island's Register Office and the adjacent public space has long been used by fishermen and local footballers. As Abubaker A Shani, ex-Chief Building Inspector points out, these spaces have become deeply rooted in the Zanzibari cultural and social psyche.

Privatisation of these spaces has caused local and international outrage. Residents, local NGOs and even government officials have questioned the terms and legality of the deal, protesting about the lack of consultation and transparency. High-level corruption and back-door payments are widely suspected.

A petition to the government and local authorities has met with silence and UNESCO has threatened to revoke the town's recently acquired World Heritage status if the development goes through. The government's response is that it can make any decision, especially regarding its properties, and no one can question it. Meanwhile, only weeks ago Chinese contractors moved in, erecting site huts and fencing, closing roads and digging trial pits. Construction trucks weighing five times the permissible load now trundle the narrow streets.

Thirty years ago, sorry neglect and mismanagement threatened the long-term future of the heritage of Stone Town. Today, unfettered development catering to the growing tourist market is proving the real threat to the physical, cultural and social fabric of the town. Restoration efforts clearly need to steer a delicate course between attracting investment and promoting tourism while responding to local needs and aspirations. Unfortunately, at present, they seem to be heading in the wrong direction.

OBITUARY

Clorindo Testa 1923-2013

Fredy Massad and Alicia Guerrero Yeste

Clorindo Testa is acknowledged as one of the most prominent Latin American architects of the second half of the 20th century. Buildings such as the Bank of London HQ (1959-1966) and Argentina's National Library (1962) are not just landmarks of Buenos Aires but also key moments in the history of Modernism.

Despite his prolific body of work, Testa was a humble and generous man. My first memory of his architecture dates back to my teenage days, when the National Library was being built. Testa's architecture still colours memories of my life then: summer afternoons at the ICI (Institute for Iberoamerican Cooperation, 1987-88), Sundays at the Cultural Centre in Recoleta (1979) or Centenario Park, facing his Naval Hospital building (1970).

The Argentine critic Jorge Glusberg noted that 'There is an "absence of dogmatism" in Testa. Owner of a daring talent, a vigorous creative imagination and a fine sensitivity, it is as difficult to place him within a specific architectural current, as it is to ascribe him to a determining artistic current, or to discover his theoretical stance regarding his own architecture or that of others.'

The key condition that defined his work says Glusberg, 'was the unavoidable presence of a guiding idea for each project'. The unpretentious Testa defined it more informally: 'The process of architecture seems slow, but it actually isn't. The procedure is slow, but you know what you are looking forward to achieving. When you start a project you know what it is going to be like, no matter how long it will take. You modify things, but inside of you, it does not change' he explained in 1998.

Testa was born in Naples in 1923. His father, a doctor who had



Argentinian Modernism at its finest: Clorindo Testa's National Library in Buenos Aires

migrated to Argentina and married an Argentine of Spanish descent, wanted his son to be born in his homeland; a wish probably born 'of romanticism' - as Testa noted - but the father refused to let his son follow in his professional footsteps. Testa's teenage interest and skill in constructing model ships led him to study naval engineering, but he quickly switched to civil engineering and, later, 'almost by chance', to architecture. Le Corbusier was his model. 'I never paid attention to other architects', he said. A trip to Europe, due to last three months, turned into a stay of two years and introduced him to painting, a discipline in which he excelled.

Growing up in the fervent atmosphere of Buenos Aires in the first half of last century, Testa is arguably one of the last representatives of an Argentinian identity and energy now sadly waning. This is metaphorically embodied in the chronology of the National Library, a building conceived during the thriving and intellectually sophisticated Buenos Aires of the '60s, which was then forced to remain in a sinister limbo during the successive military dictatorships of the '70s. Yet the democracy of the '80s failed to rescue it and the Library had to wait until the '90s to be officially opened; paradoxically, under the

neoliberal government of Carlos Menem, a period that ushered in a tragic decline in the country's cultural aspirations.

For modern Argentine architecture, Testa was a foundation stone and anchor. His work, which belatedly achieved international recognition, and his understanding of architecture, epitomised that specifically Argentine idiosyncrasy: the perfect absorption of everything universal to create something completely and uniquely local.

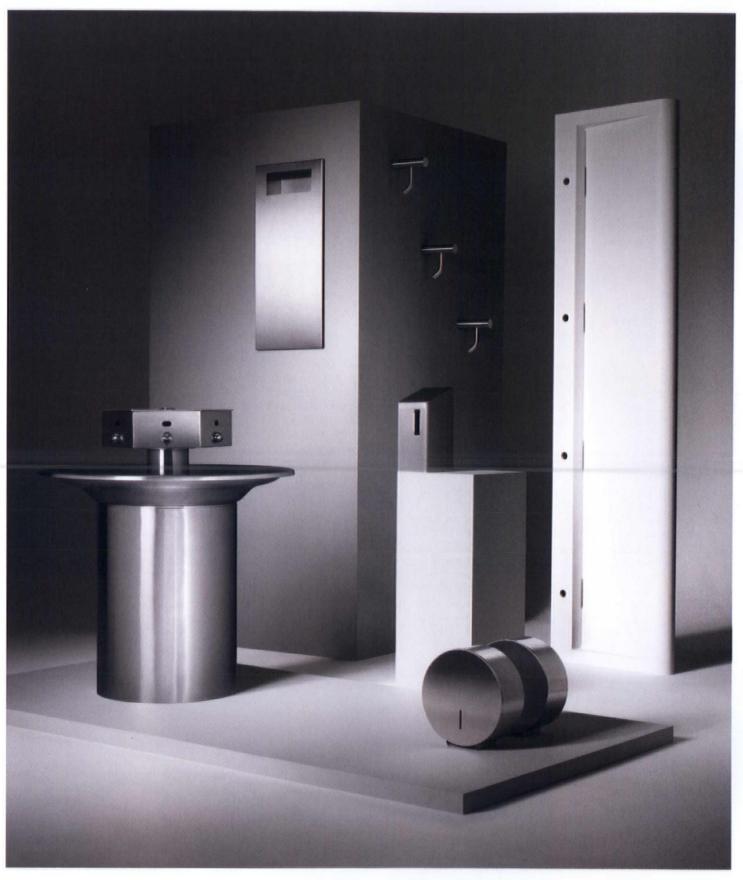
AR COMPETITIONS

GAGA

The Global Architecture Graduate Awards 2013 is now open for entries. A prize fund of £5000 rewards the world's best student work. Closing date for entries is Friday 5 July. For information go to: architectural-review.com/gaga

AR House

The closing date for the AR
House Award has been extended
to Friday 10 May. A £10,000 prize
is offered for the best one-off
house. This year's jury will be
Francisco Aires Mateus
(Portugal), Amanda Levete (UK)
Takaharu Tezuka (Japan) and
Catherine Slessor (AR Editor).
For more information go to:
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Design review

Milan 2013

This year's Milan Furniture Fair once again flaunted the superiority of the Italian design industry, ruminates Nigel Coates In the annual lead up to the Salone Internazionale del Mobile, the rumour mill already grinds. This year was no different, though with less spice perhaps. How many visitors? Who won't make it? Will the Charme group (Poltrona Frau, Cassina, Gufram) be back? How do you get on the list for the best parties? And most important to designers: who are their competitors, the rising stars? The 330,000 visitors and, for some companies, a bumper year in terms of sales, suggests a cavalier fight-back in times of strife.

With hundreds of events large and small scattered across the city, and 2,500 companies exhibiting in the main fair, the Fiera at Rho, Milan celebrates the design equivalent of the Edinburgh Festival and with equal drama. Much effort was put into the packaging. Fashionable Via Montenapoleone sported fullyfurnished balconies by major brands. At the Fiera, outstanding displays at Cappellini and Kartell offset museum-like displays of greatest hits.

Overall, Milan continues to make any other design fests look puny by comparison. The reasons are simple — Italy (unlike the UK) still has a viable industry capable of turning ideas into reality. The entrepreneurial spirit sits well in the family business. Designers and design companies are mutually supportive, while in Britain, we have lots of design talent but almost no manufacturers.

It is true that Italian industry is on the skids. Berlusconi's profligacy hasn't helped, and neither have Monti's exorbitant taxes. It's the couture end of design and, like fashion, it is readily copied, particularly in the Far East. Across the nation empty factories seem to outnumber those still operating. Every Italian furniture or lighting company worth its salt now has to work that much harder and reach that bit further. Despite little chance of selling at home, there is every possibility of upping your exports.

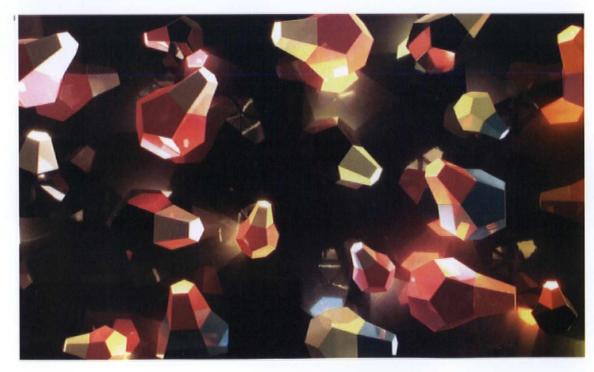
Whether you come from Italy or anywhere else in Europe, sitting on the fence means you're dead in the water. 'Made in Italy' still carries cachet, and it will increasingly only be the preserve of brands that innovate and communicate. Foreign companies know they will attract attention, even if for any visitor it is impossible to visit every show.

Like virtually all visitors, designers included, you set out with a plan of where, who, and when. You tailor the experience by joining up your own dots in the guide while being open to the unexpected in the cultural dérive. In the Fuorisalone, the most engaging work was by young designers making the most of small-scale production. If they come from Italy they still have a wealth of artisanal support to draw upon, and if they are from outside, the UK included, they probably make it themselves. As well as the offbeat shows in town, I also wanted to eatch the mood of the big furniture companies at the fair like Magis, Moroso and Edra. Indeed there were surprises hidden among the reissues.

Rather than a Salone that was down at heel, I found confidence in all quarters. The same designer names predominate but there are plenty of emerging stars too.

Ours is an era of the survival of the fittest, but there was much to inspire from masters and newcomers alike. My double-dozen selection covers the gamut from industry to artistry. These pieces are the perfect match for the domestic future perfect.



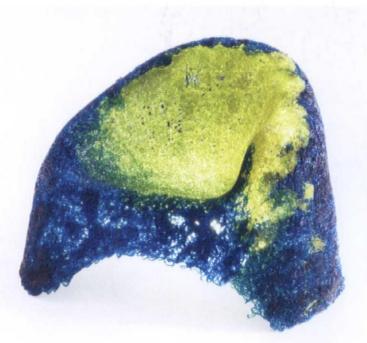




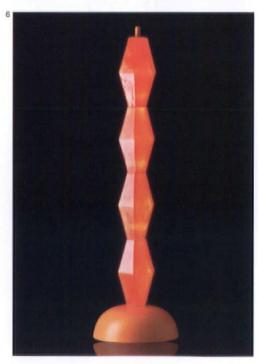
2. Zaha Hadid's Avia lamp for Slamp is at once organic and high-tech. The fins radiating from its central void create a complex interplay of translucence and opacity that shifts with the viewer 3. The Analogia Project, a talented young design team from Milan, launched a bespoke tile system that captures archaeological treasures by scanning the originals digitally, and then translating them into bas-relief 4. Empatia by Carlotta de **Bevilacqua for Artemide.** The fibre-optic spray revisited – each perfectly formed lamp harnesses an LED source and transfers it upwards along an acrylic rod to generate a fountain of light







5. Jacopo Foggini translates his experience in making gigantic light installations into a chair, the Alice for Edra. Internal lamps highlight the translucency and granular quality of the acrylic material 6. Venini, the most consistent name in Murano glass, trumped rivals with several big name pieces including the Ginevra lamp by Alessandro Mendini. Its Brancusi-like stack perfectly suits the artisanal moulding







10. Brazilian rising star Zanini de Zanine loves the chunky. His Inflated Wood chair for Cappellini combines cartoon-like over-scale with a sensual appreciation of the grain and mass of reclaimed **Brazilian hardwood** 11. Once on the margins of design, Fornasetti has in recent years reoccupied the centre ground. Barnaba Fornasetti's Peccato Originale (Original Sin) table features a snake that

bites a blood-red apple



the arms hug the sitter





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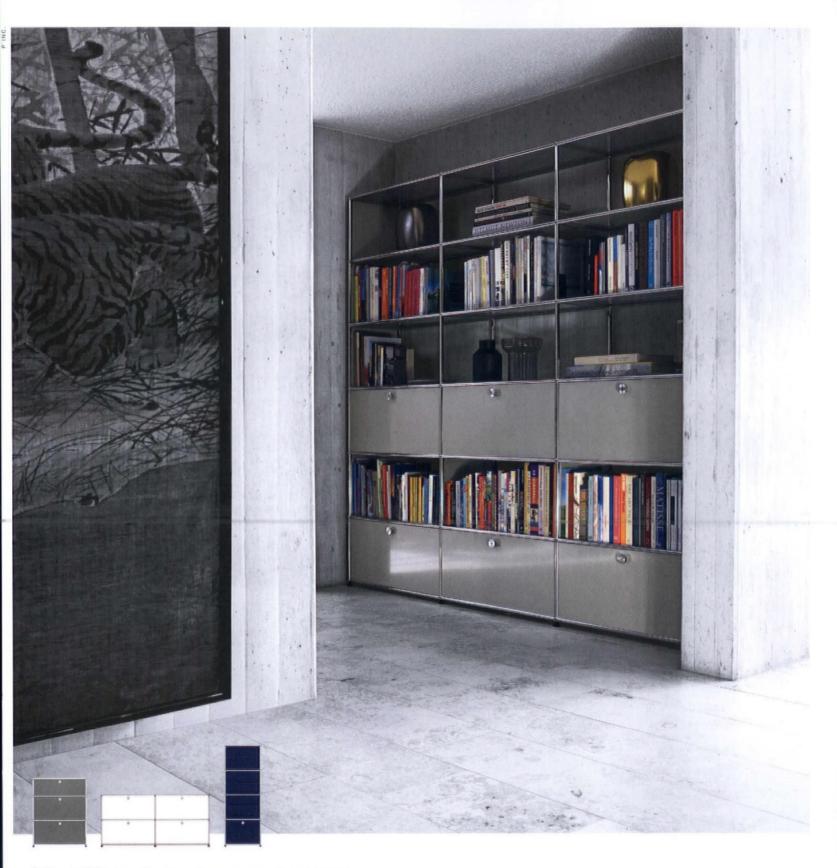


12. Japanese design desiderati Nendo seem to crop up in all quarters. At Caesterstone their signature simplicity combines separate tablets of stone together, each with w a single support 13. Super thin rod and a vocabulary of ironic elementalism has given birth to Konstanin Grcic's Traffic series for Magis. **Block-like upholstery** appears suspended above a structure with medical connotations

14. Far from their world of limited editions, Cliff Shelving, Nendo's first design for Kartell, celebrates the company's skill with plastic both as a material and as an industrial product 15. Firmly on the limited edition front, Nendo's collaboration with **Dilmos demonstrates** their breadth in approach while using one material - glass. This cut Baccarat goblet has been reheated to soften its sharp edges to remarkable effect







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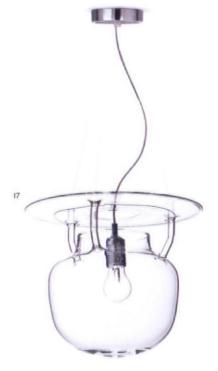


james burleigh



16. London-based designers Odd Matter created this exquisite limited lighting piece for Vessel Gallery. Faces of tinted glass are fused in a clever process of copper deposit that results in a granular surface 17. My own Carry Artid lamps for Secondome **Editions seem to** reverberate as if a solidification of the light source itself. They are derived from a series of five vases in glass that reflect a family of iconic forms 18. This modular LED wall or ceiling lighting system, Crocco for Slamp, also by me, combines elements in three different sizes in seven colours. The end-user can effectively design their own installation





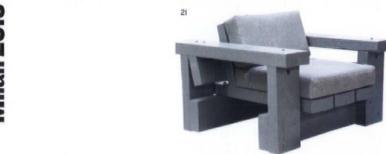






20. Zaha Hadid's beautiful 20 tables for Cisco combine digital skills with marble, the eternally sensuous material. Rising and falling surfaces congeal into a horizontal outcrop 21. As if to counter the predilection for swathing forms, Piet Hein Eek goes super butch. Combining massive timbers and tarpaulin upholstery, his chairs, sofas and cupboards are the last word in military chic 22. The aptly-named Kuki chair, the latest in Zaha Hadid's ongoing collaboration with Sawaya & Moroni, turns a complex of digital trajectories into a solid you can sit on 23. Sofas, storage system tables and accessories combine in Bikini Landscape, Werner Aisslinger's new way to relax in the living room for Moroso. Its many parts encourage members of the family in their often divergent activities











1968 We opened our first office for business in Merseyside.



1973 Lots of changes were made to our products as they began to evolve.



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1983 installed in Strangeways prison.



Our first overseas order - in Dublin, Ireland.



We won our first (of many) D&AD design awards.



Our Oasis cubicle was launched, with little argument.



We installed Icon cubicles in The Museum of Modern Art, New York.



2008 Our Flow cubicle was designed and installed in King Street, Manchester.



2013 We're somehow still going strong after 45 years of business.



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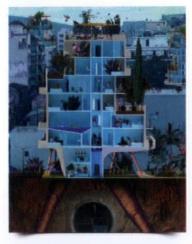
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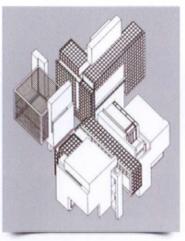
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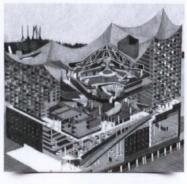


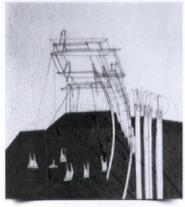
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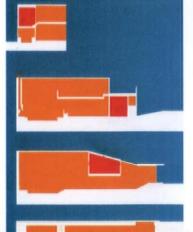


















View from...



The world's tallest public housing towers dwarf Singapore's traditional low-rise urban milieu, epitomised by the shophouses in the foreground. Increased density is seen as the key to accommodating a growing population on a compact land mass

Singapore

One of the world's most liveable but most geographically constrained cities faces huge challenges in housing an expanding population, says *Colin Seah*

In the annual beauty contest to be ranked among the world's most liveable cities, Singapore has always figured. Few would be surprised by this, as the tiny city state has a global reputation for being clean, green and safe. Yet to take Singapore's current standing for granted would be to ignore the dynamics of its past and the uncertainties surrounding its future.

Singapore has developed at an incredible rate. Observers have often dubbed its rapid urbanisation the 'Singapore Miracle'. Over an abnormally short period of less than 50 years since independence, a series of government decisions have irreversibly shaped modern Singapore through frequently pervasive and prescriptive policies. Overcoming racial and political unrest and a scarcity of essentials such as hygienic housing, infrastructure, natural resources, land and water in its formative decades, modern Singapore's current phase of evolved urbanisation strives to strike a balance between conserving kev heritage sites and developing new work, live and play environments. Its success has imbued the city planners with confidence and established it as a global authority on urbanisation. Developing nations such as China and India frequently consult the Urban Redevelopment Authority and other key governmental agencies.

However, 21st-century Singapore faces new pressures and cannot rely solely on re-enacting the policies of the past. These pressures are both external and internal. Externally, Singapore's dependence on a world in flux demands that it remains agile and relevant. To remain relevant, it must address internal factors, notably that its population needs to grow in order to maintain economic competitiveness. Official projections forecast an increase from the current level of 5.3 million to 6.9 million by 2030, resulting in significant pressures on the provision of housing and infrastructure, coupled with an ageing population.

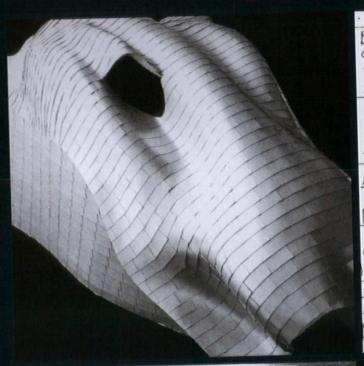
To maintain its status in the face of these challenges, Singapore has two parallel development strategies. It continues to explore radical notions of increased urban densification, in tandem with developing new towns in suburban locales. In one key paradigm of densification, the Housing Development Board (the government arm responsible for developing apartments which house over 80 per cent of the population) held an international competition for a pilot high-rise development in central Singapore. The brief was for seven 50-storey towers housing over 1,800 households on a 2.5 hectare site, a scale that would be unimaginable in Europe.

Now built, the winning scheme by ARC Studio boasts the world's tallest public residential towers and has established an important precedent for future urban densification and development.

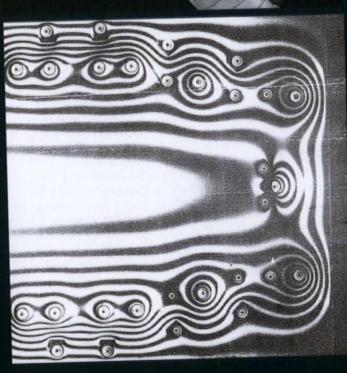
Numerous suburban new towns exist on the fringes of Singapore Island, but with its finite land area (710 sq km), Singapore has had to look beyond its shores to house its growing population; specifically to its northern neighbour, the Malaysian city of Johor Bahru. Both governments have agreed to enhance connectivity between the two cities with a new transit line joining the existing bridges across the narrow straits. Bolstered by this clear signal, private developers from both countries have responded by launching housing developments in vast gated communities (projected for completion in the next five years with more to come) on sites around these access points.

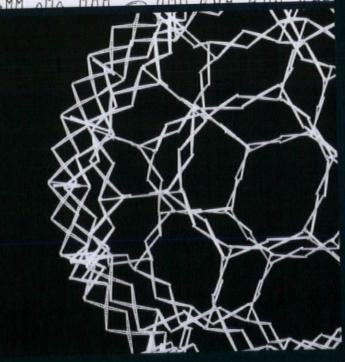
Yet though these strategies may generate the required quantity of new housing, the quality of life in such developments remains largely unaddressed. This can only be gauged over time, as neighbourhoods mature, and social and cultural amenities kick in. However highly ranked Singapore may currently be, maintaining its liveable city status in years to come will be a constant work in progress.

Archaeology of the Digital



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Images: Frank O. Gehry, Lewis Residence, Lyndhurst, Ohio: Study model of the entry hall (detail), 1989 –1995. Image provided by Gehry Partners, LIP; Peter Eisemman, Eisenman/Robertson Architects, Biozentrum, Biology Center for the J.W. Goethe University, Frankfurt am Main, Germany: Schemalic representation of a DNA sequence (detail), 1987. Peter J.W. Goethe University, Frankfurt am Main, Germany: Schemalic representation of a DNA sequence (detail), 1987. Peter Eisemman fonds, Canadian Centre for Architecture; Chuck Hoberman, Hoberman Associates, Expanding aluminum sphere, Eisemman fonds, Canadian Centre for Architecture; Chuck Hoberman, Hoberman Associates, Expanding aluminum sphere, partially deployed (detail), 1991. © Walter Wick; Shoei Yoh, Shoei Yoh, Shoei Yoh + Architects (organical Schoei Yoh), 1990. –1992. © Shoei Yoh + Architects

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Viewpoints



WILLIAM JR CURTIS

Honouring and dishonouring Le Corbusier

We inhabit buildings but are also inhabited by them. When I look back, a string of architectural works haunt me, from Canterbury Cathedral to Pugin's Grange in Ramsgate, both experienced as a child, to Le Corbusier's Carpenter Center for the Visual Arts at Harvard University where I studied and taught in the '70s and early '80s. I wrote my first major book about this building - a meticulous reconstruction of its design and construction, based on a close analysis of drawings, letters and recollections.

The text served as a Harvard PhD in 1975, and was published as Le Corbusier at Work, The Genesis of the Carpenter Center for the Visual Arts. This study was one of my foundation stones as a historian. By focusing on a single architectural specimen through a microscope, I was able to intuit some principles of historical method, even to get closer to the mind, meanings and creative process of a great architect.

This year is the 50th anniversary of the Carpenter Center and I am marking it with a series of lectures. The first was in the Maison du Brésil designed by Le Corbusier and Lucio Costa in the '50s, and the second at the Boston Society of Architects. At Harvard, the anniversary is marked by events that express ironical distance or a lack of real interest. In the building itself there has been a sort of postmodern pantomime called Brute. Featuring the sort of neo-avantgardist virtual installations beloved of theory-blinded academia, the low point is surely a model in the lobby which presents Le Corbusier's building as a structure stuffed with straw floating on a tacky blue plastic surface. The ramp is shown covered with twinned small toy animals (Noah's Ark, geddit?). Brute no doubt refers to a letter which Le Corbusier wrote to Josep Luís Sert, friend and executant architect of the project. in which he exclaimed that beton brut' is not the concrete of a brute but just concrete cast directly from the form work; unlike at Marseilles where the surfaces were textured, at Carpenter they are smooth and precise.

Rather than looking into the history, meaning and contemporary implications of Le Corbusier's building, the Carpenter show Brute makes a point of blurring fact and fiction and of trivialising both art and reality. The response to a work of authenticity is a sort of over-sophisticated mockery. a refusal to deal with depth of content. Meanwhile at the Graduate School of Design, there is a small show in the library of a selection of Le Corbusier's presentation drawings. Executed by Jullian de la Fuente but signed Le Corbusier, these give 'la sensation architecturale, pure et simple', as the master put it. With their pale ochre planes evoking surfaces of concrete, blue crayon rectangles suggesting openings with glass, and red lines describing structure, they lucidly convey the main relationships and proportions of primary volumes harmonised by the Modulor.

These drawings hark back to the Purist paintings of the '20s. Indeed the building as a whole is

like a summa of Le Corbusier's architectural elements in concrete while the plan shapes and S-shaped ramp refer to his American experiences and the ideology of the Ville Radieuse. None of this emerges in these Harvard shows and the GSD one makes the extraordinary assertion that Carpenter is the only work by Le Corbusier in the Western Hemisphere (what about the house in La Plata?). The assertion is also made that the drawings have never been shown to the general public. Wrong again! In 1980 I curated a show at the Boston ICA Forty Years of Modern Architecture, which included a selection. In 1981 I curated Fragments of Invention, The Sketchbooks of Le Corbusier in the Carpenter Center itself.

In this case, a selection of the drawings was accompanied by eight of Le Corbusier's original sketchbooks and several other original drawings from the Fondation Le Corbusier in Paris The layout was conceived by Roger Brandenberg-Horn, the talented resident exhibition and graphic designer who played the building as if it were a musical instrument. On display on the third level visible from the ramp, the drawings resonated with the space of the building itself, suggesting correspondences across time, and hinting at the architect's sources of inspiration, as well as his powers of transformation and invention.

In those days Harvard cared more about Le Corbusier, more about visual education for its students, and possibly more about architecture itself.

LAST WORDS

'To MoMA, absorbing the Folk Art Museum would be like furnishing a pristine Modernist house with an overstuffed floral couch'

Justin Davidson on the demolition of Tod Williams and Billie Tsien's American Folk Art Museum, New York Magazine, II April 'The vibe is junior Arab dictator'

Peter York on One Hyde Park by Rogers Stirk Harbour & Partners, Vanity Fair, April 'Developer, Soleri would say, starts with D, like devil and demon'

Oliver Wainwright's obituary for Paolo Soleri, who died last month, *The Guardian*, 10 April

Your views

Charles Jencks on the power law of bad architecture

Peter Cook is dead right (Viewpoints, AR April 2013) when he points to the formulaic nature of architecture that is too big, but I would not place the size at 12 storeys or put the blame just on the developers. As I pointed out in 'How Big is Bad?' (AR August 2002) there is a power law in sociology and biology that shows the limits of size in organisations, technologies and animals. (Power laws in general are a fascinating scientific subject for architects.)

There is a 'Law of Diminishing Architecture' where quality goes down and boredom goes up with stereotype and it sets in at about half a million square feet. 'Bigness', theorised by Rem Koolhaas, becomes too big at about this point, I opined, because of money, the way hugeness has to be financed by multiple parties and therefore safety and stereotype take over. Architecture tends to diminish above this size (70 storeys if it is a vertical building, but it is volume not height that matters) unless it is a prestige headquarters, a national symbol or some crucial building. In such cases, much extra money will have to be spent to equal the same quality of a smaller building.

Why? Because economies of scale, after a certain size, turn into dis-economies; and multiple corporate finance usually turns to safety first. I discussed this 'power law' with Cesar Pelli (who did not entirely agree) and tried to with Rem Koolhaas (who was not particularly interested).

Obviously, as a social law where there is a cultural variable like 'prestige' at stake it will be hard to get consensus. As with global warming there are changing technical details that make for dispute. But Peter Cook is basically right, as anyone can see who flies over any major city today and sees the evidence below them: bigger, over a certain size, is usually dumber, a 'power law' that may move with time and technology but is nonetheless, sadly, very powerful.

Charles Jencks, London

London's learning

Following on from Will Hunter's long-overdue vision for the future of architectural education (October 2012), his recent series of 'London Schools' articles comes as a disappointment. His airing of the tired rhetoric of over-exposed London schools doesn't offer much inspiration for the future of education - and, fortunately, bears scant resemblance to the current climate of UK architecture schools. It is clearly flawed to presume that a reading of these over-publicised schools will give any deep insight into the quality of design education today.

The series reveals worrying assumptions that excellence can be equated with a coincidental adjacency to the many high profile architects working in the capital. Visionaries rarely have the capacity to teach well, but having basked in their aura of pedagogical neglect will surely impress a future employer. If the purpose of these articles is to interpret the current state of architectural education through the schools' recent extensions, then how representative is London of current trends?

Does the future of education lie in schools like Central St Martins: a corporate ensemble of pregentrified studios where students (read: customers) are seen as an investment in the creative sector, rather than the next generation of progressive thinkers?

All these articles expose is an alarming trend toward the corporate management and



'A corporate ensemble': the new CSM

pseudo-privatisation of an elite group of self-referential schools and its impact on their future pedagogy. Surely the AR's purpose is to critique the current state of architectural education and to speculate on its future potential? If it were to look outside London for a moment to the many other schools of architecture nurturing creative talents, then these articles would read very differently.

Nathan Humfryes and Oliver Green

In defence of The Big Rethink

As a practitioner in the field of space-making and in reply to Maritz Vandenberg's letter last month questioning how useful The Big Rethink is to the average architect, I feel obliged to comment.

There is always a tension between being visionary and being relevant, and many careers have run aground in the turbulence between the two. I have sat with previously successful players as they, devastated, faced bankruptcy and the failure of their projects — having accounted for some aspects of the problems they were solving but failing to comprehend others.

In this context I would like to say The Big Rethink is the finest contribution to this tension that I have ever encountered. I believe it stands alone, in many ways, within the marketplace of ideas and articles in the field. Spacemaking is a realm that is swollen with big ideas and thinkers. The grandness of egos in our part of the world is famously documented. But what has been missing is a great connector - someone who can knit together these ideas in a clear and simple way. It is a huge task, and the AR is doing important work in delivering this for us to consider. I can only hope that the practitioners and thinkers of our day will find your work and wrestle with it deeply. I look forward to the forthcoming conclusion of the series.

Will Neder, by email

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SPECIAL ISSUE: ARCHITECTURE & REPRESENTATION

Many of the pages in this special issue highlight the intense relationship between architectural ideas and the tools used to express them. But, in their twinned evolution, is it the tools leading the ideas, or the ideas leading the tools?

Since the advent of the computer this interrelationship has grown ever harder to unpick. But in a determined search for answers, the Canadian Centre for Architecture is staging an important new exhibition *Archaeology* of the Digital, part of an initiative to establish the role of yesterday's digital pioneers in transforming today's design practice (page 44). For the show's curator, Greg Lynn, it is the architects who have forced the tools to catch up with their architectural vision.

Peter Eisenman wanted to use DNA structure to create a diagram for a building; Frank Gehry wanted a better constructional result for his sculptural forms; and Chuck Hoberman wanted to make an architecture of moving parts. Together the three of them have influenced the subsequent creation of FormZ, the architectural applications of CATIA, and animation software now used by Hollywood.

Technical advances have, in turn, allowed new architectural methodologies to emerge. Eisenman, for example, fully departed from the Cambridge teachings of Colin Rowe — who was interested in the parti — and committed to the morphological diagram, pursuing a distinctive approach, repeating and adapting formal motifs, which Lynn sees as the real father of parametric architecture.

Nicholas Olsberg (page 36) strikes a more sceptical note, arguing that the rise of digital software has not – as yet – supplanted the hand in the exploration of ideas. 'The visionary and speculative tradition in architecture is surely the one where the computer has the least advantage over the paper sketch,' he argues. 'It cannot produce an idea at anywhere near the speed of the pencil stroke.'

This certainly is true for Laura Allen, whose work graces this month's cover. The drawing – reproduced in full on the fold-out after page 66 – was made in an

afternoon; and the intricate concertinaed depiction on page 63 was dashed off in under half-an-hour. Interviewed by Peter Cook with her partner Mark Smout, Allen is emphatic that 'drawing is a thinking process'.

In this area she believes the computer can be disadvantageous, describing the drawings cut from Rhino models that she often sees at the Bartlett as 'nonsense'. 'It's a totally different outcome to designing and drawing in section,' she says. And (despite being credited with inventing parametric design) Eisenman agrees with her. 'Architects and architecture students have lost the capacity to think through drawing. They can only think through a computer,' he laments on page 80.

Eisenman is an enigmatic case indeed. He places himself in the conceptual, cultural and intellectual camp in direct opposition to the phenomenologists (Peter Zumthor et al) who are interested in the experience of buildings — a position he took to such an extreme that he didn't think it necessary to visit his early houses, referred to his buildings as 'built models', and was delighted when in a photograph one of his completed buildings was mistaken for a model.

Yet today Eisenman feels it essential to build. He relates how Manfredo Tafuri once told him: 'Peter, if you don't build no one will take your ideas seriously.' And it is here that the relationship between ideas and tools becomes further complicated. For while it is probable that the trajectories of ideas and tools develop more-or-less in tandem — sometimes one being ahead, sometimes the other, and in different strands — it is how the architectural concepts that they represent intersect with the possibility of construction which is the final test.

But does that mean every idea has to be built to be validated? Not at all. The richness of ideas presented here, the value of describing radical visions for the future, of speculating about an architecture that may never exist, and of pursuing notions that may go nowhere at all: these are an essential part of architecture as a risk-taking discipline. It is these endeavours that keep the culture of architecture alive, and ultimately push built reality to greater heights. **Will Hunter**

ARCHITECTURE & REPRESENTATION

THE EVOLVING ROLE OF THE DRAWING

Over the course of the 20th century, advances and experiments in the techniques used for architectural drawings reveal much about the discipline's 'state of mind' at the time. Read individually, drawings offer vivid and unique character portraits of their architectural authors. And today, argues *Nicholas Olsberg*, the dexterity of the hand is still unbeatable in quickly conveying an architectural idea

Palaces of Communism.
Pencil miniature
(10 x 10cm) of an urban
ensemble from one of
many cycles of hermetic
studies for socialist
cities of the future.
Undertaken c1936-41
while banned from
practice or publication
2. Peter Eisenman:
House VI, from
a set of presentation
axonometrics, in
mylar collage, 1972

I. Yakov Chernikhov:

Carlo Scarpa, in a famously infamous gesture, opened all his courses in design at the University of Venice by demonstrating the art of sharpening a pencil. That was the precise point, he claimed, from which all architecture proceeds. And it was to protest against precisely such points that his students revolted in the mid-1970s, running him out of the directorship of the institute before he had barely started.

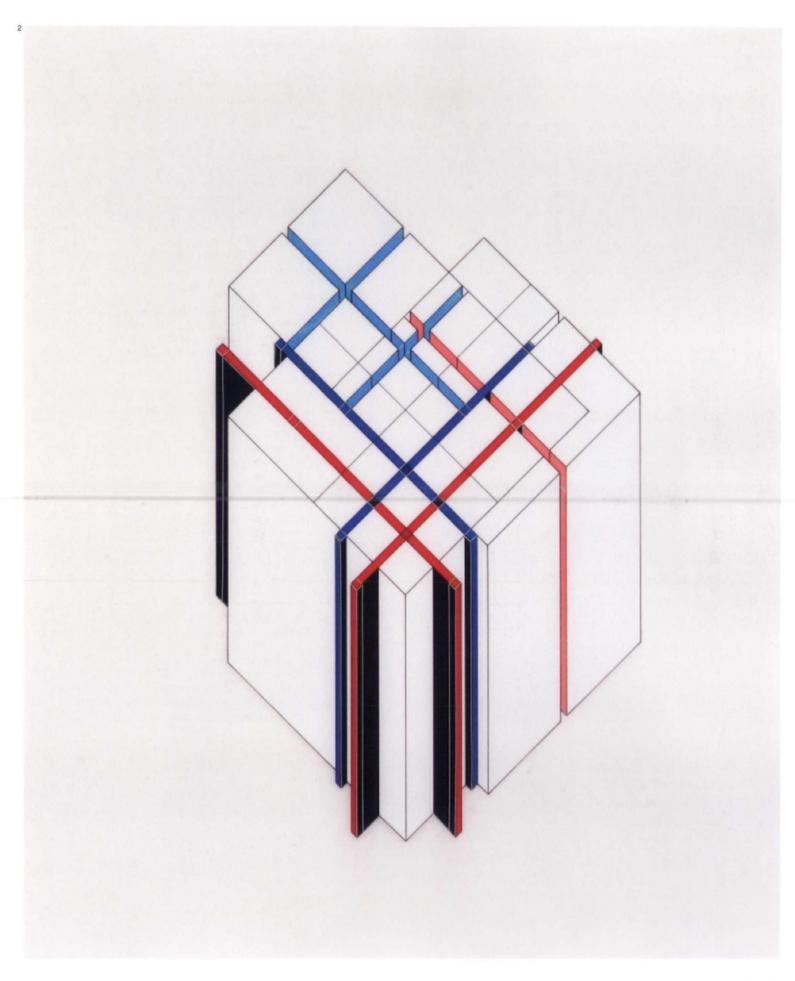
Drawing architecture has never been taken for granted. It has constantly changed, both as new materials, conventions and techniques appear, and as it responds to the changing visual climate. From the 18th century on. we can watch as drawings change the thickness of line to reflect that of evolving print media; adopt colour codes for materials; take on the oriental isometric and axonometric projections and weave them into 19th-century schooling; use coloured crayon, magic marker, strips of mylar; build in photographic elements as montage; take cues from film to sequence their narratives and from animation to people them. It is always varied. There are some who never cared to draw, but as each new shift in technique appears, every architect who did begins to show a characteristic approach to line, or shadow, or framing, or the suggestion of space. And drawing has often, as Scarpa found, been contentious.

Architecture as a state of mind

Nothing this rich or disputed can be thought of simply as a tool of the trade. Drawings might test, advance or sell a design idea, and the stamped, signed drawing - even now, when we file tax returns or purchase online - is still the instrument by which a building is executed and legalised. But the drawing is not a metaphor for an absent building. It is an essential and persistent element in the culture of architecture, and a means of portraying what John Heiduk called its 'state of mind'. In Hejduk's case, drawing was by choice the primary pursuit. In Yakov Chernikhov's there may have been no choice, as, in Stalin's Russia, he dreamed first of mechanistic worlds a-building and then of a metropolis of romantic pastoral concoctions already a-crumbling. Absent, even in the proposals for Palaces of Communism with which he hoped to gain favour, is any sense of a structure likely to emerge from the act of defiance against pomp and prettiness evident on paper.

In Peter Eisenman's House VI, drawing and building are indissoluble: the house reads effectively as a model of the axonometric dream sequence by which it was conceived (see p80). For Aldo Rossi, who came to building late in a long career, the built work seemed so often to grieve for the more eloquent drawings that had conceived it, that he turned to reimagining his works after the fact,







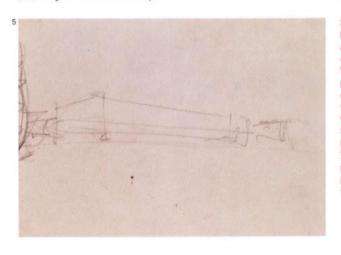
'The drawing is not a metaphor for an absent building. It is an essential and persistent element in the culture of architecture, and a means of portraying what John Hejduk called its state of mind'

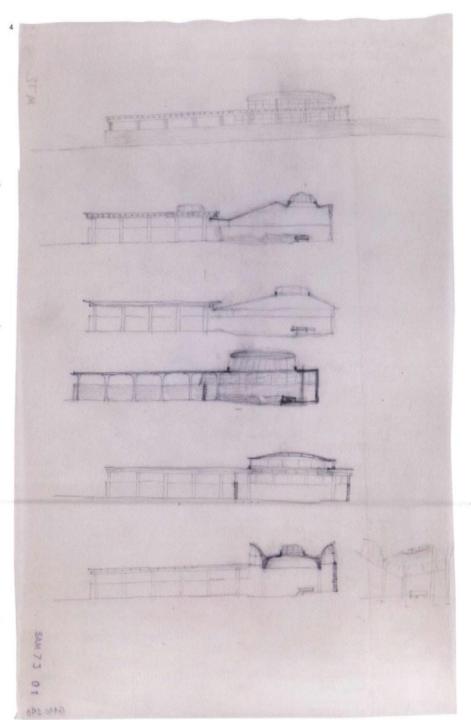
painting visual assemblies that changed their context or underlining by distortion their metaphorical relationship to their surroundings, or, as in the case shown, laying the architect's hand on the layers of history in modern Rome.

Meeting points: drawing, thinking, showing

Throughout the 1920s and '30s, much of the essential discourse in American architecture was in a magazine called Pencil Points, and it was the visionary romanticism of drawings by people like Hugh Ferriss in Scientific American and Popular Mechanics that painted pictures of future cities, rather than the didactic models of Wright's Broadacre or the schematics of Le Corbusier's Ville Radieuse. As late as 1928, the architects of Los Angeles' Westwood Village were rendering a new automobile mall in red chalk studies that could have been Hubert Robert's nearly 200 years before. We think of Wright talking then of his draughtsman Jack Howe as 'the pencil in my hand', of Will Alsop encouraging the citizens of Barnsley to draw their future city with him, or of a single Frank Gehry sketch serving to tell his modelmakers everything essential about the space and form of an elaborate scheme.

Yet drawing, and especially perspective drawing, was losing favour through the early decades of the Modern Movement, as representation followed the lead of newsprint and magazine graphics, film and camerawork to more neutral and literal formats. Mies van der Rohethough a master at sketching space, vista and volume favoured the photomontage of models through which the radicalism of his new work could stand out from its urban context; the Hungarian Modernist Farkas Molnar turned to the simple outline drawing that would work as the cut in a mass-produced pamphlet. Others, like Bucky Fuller in his mimeo sheets or Herbert Matter in his diagrams for the Eameses, turned to the semblance of objectivity and the pseudoscientific. By the late '50s, a practice like Gordon Bunshaft's SOM New York had installed a daily routine of destroying all draughts and studies. All that survives of the study process in that office are the few fragments smuggled out at night by the odd Modernist who continued to value the conversation between idea, hand, eye and paper and to give credit to its result. We know of Richard Meier's insistence on the flat drawing table for his studio, in an effort to resist the pictorial and perspectival bias of the angled drawing board. In another setting, the Tokyo of the '80s, the emergence of drawing as central to the public postures of a practice like Tadao Ando's or Kazuo Shinohara's was decried as a parade of the personal, somehow antithetical to the spirit of community.





3. Aldo Rossi: 'Urban Fragments', in oil, crayon, and magic marker, 1977
4. Erik Gunnar Asplund: Woodland Cemetery, preliminary pencil elevation studies for the Chapel of the Holy Cross, c1935
5. Ludwig Mies van der Rohe: Illinois Institute of Technology, preliminary pencil perspective study, probably for Crown Hall, from a notepad, c1949-50

The common sticking point in all these was the tendency of the drawn sheet to display a private language, an idiosyncrasy, a pictorial 'personality' that defied the rational and universal formulas for reform that marked the dominant strains of the Modern.

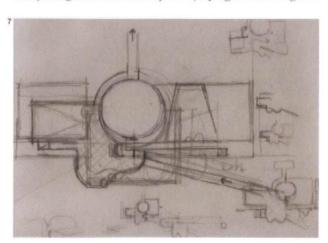
That sense of a characteristic hand and eye is, of course, precisely why, looking back and meeting the authors on the sheets they worked, we love those drawings. It is not surprising, then, that the last great revival in drawing art came in the '70s as architecture tried to release itself from the trio of Late Modern shackles — urban design, extreme functionalism and radical non-architecture — to which its sense of 'autonomy' had been surrendered. In preliminary studies over five decades, we can see this idea of a distinctive vocabulary at work and re-emerging.

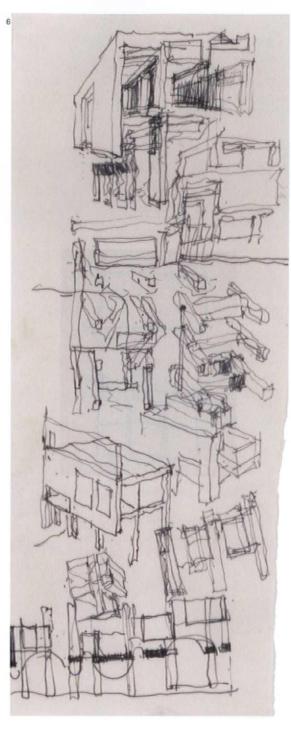
The obsessive Gunnar Asplund, in discovery mode, lays out a sequence of alternate elevations on a single sheet, liking the last enough to start unfolding its spatial logic. Rough as they are, each sketch carries a different weight of line to match its different sensibility. Asplund would habitually develop a full new measured drawing set for every change in a developed design, with different typography, frame lines and thickness of line, arguing that the shift in scale or feature of a single element required the modification not only of the whole built scheme but of the drawings that would rightly represent it. Mies captures an entire scheme and its context with a single stroke of the pencil. Le Corbusier is quite untroubled by combining a sketch plan for his unbuilt Governor's Palace at Chandigarh with a view of the Himalayas to which it would relate: this is one of a set of 12 preliminary sketches for the project which he gave a new assistant as the best introduction to his methods and codes. Peter Eisenman in volumetric ink, James Stirling in pencil plans and Michael Graves in colour profiles all show the same essential approach to working out the fundamentals of a project by analysing its parts and their relationship.

None of these apparently hermetic studies is fundamentally unselfconscious — in one way or another (like the draughtsman surely looking over Mies's shoulder) each of these rough sheets was meant both as a way to think and as a way to be seen.

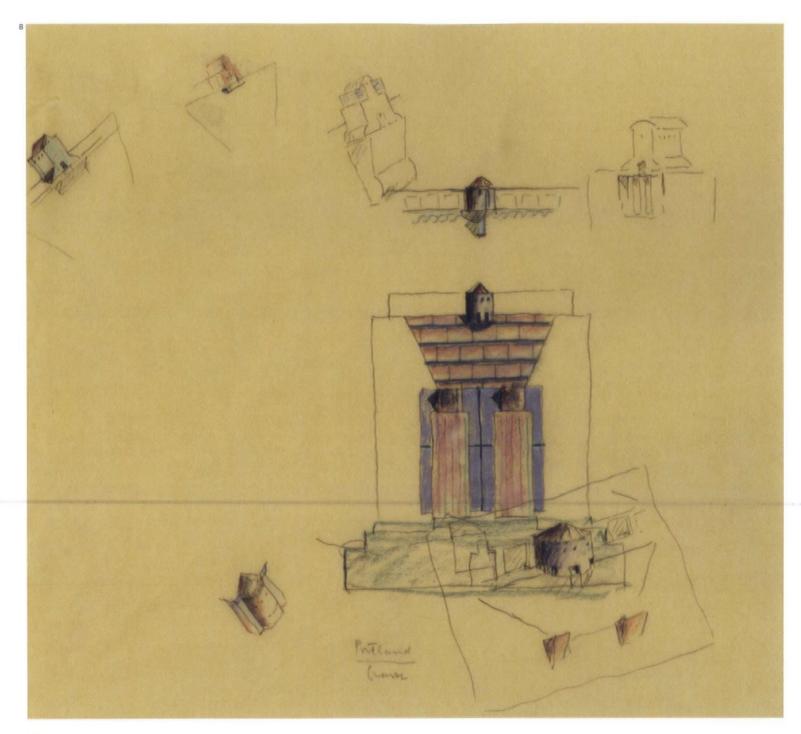
Medium and message

Even at their most formal, in the presentation drawing, architects at their smartest vary their approach to match the character of the drawing to the nature of the project. Richard Neutra takes pen and ink – the tools of Civil War magazine illustrators – to render his visitor centre at Gettysburg National Military Park, laying it down to greet





6. Peter Eisenman: House II, preliminary volumetric studies in ink for form and structural details, 1967 7. James Stirling: Staatsgalerie, Stuttgart, pencil studies for plan of intersection, c1977 8. Michael Graves: Portland Building. preliminary coloured pencil study of general elevation, with perspective and other sketches for a proposed cupola, 1980



'None of these apparently hermetic studies is fundamentally unselfconscious — in one way or another, each of these rough sheets was meant both as a way to think and a way to be seen'

us in elongated perspective, as a sort of sleeping geometric giant with a long tail, lying amid its bulkier landscape. The drawing begins and ends on the sheet decisively, but the white space and lack of a frame allow us to imagine the larger context - the fields upon which thousands died - in the remaining void. Hejduk's 'fabrication' of three wall houses is casually composed in magic marker, but rigorously scaled and presented as elevation, section and a tiny bird's-eye perspective, the very 'feast of forms' he announces on the page. Cedric Price's submission for La Villette, layering painted mylar channels over a unique print of the plan, shows that the essence of this veritable city of pavilions was not the emplacements themselves but the movement between and around them along a set of metaphorical 'arcades'; at the same time its echoes of Situationist mapping make it clear that the routes and uses of the park are to be reinvented at the visitor's whim.

A new phase of mind

Among Neutra's great achievements as a draughtsman were the renderings he did as Wright's assistant in the 1920s on the vast spiralling megalithic observatory for Gordon Strong. Behind those renderings are layer upon layer of the measured drawings needed to calculate the construction in linear solids of a fluidly diminishing sequence of drums. It took Neutra and his brilliant colleagues at Taliesin all summer to build this essentially analytic structural archive. Before anyone bewails what digital rendering has done to undermine the habit of drawing, let them think of the huge gains in efficiency that computer design and milling has wrought, and of the consequent liberation not only of forms and possibilities but of the talents that were once engaged in the mechanics of specification and draughting. As for the testing of alternatives, while we might hate to lose that meeting with a probing mind to which a sheet of Asplund studies is an introduction, it is comforting that a fanatical design logic like his can now be respected with the touch of a button rather than the patient recalculation of an entire new drawing set.

It is hard to decry these advances, and therefore understandable, if very odd, that the chorus of regret surrounding the digital has extended precisely to those domains where it probably has the smallest impact. Recent homages to Lebbeus Woods are replete with references to the 'last of the paper architects', when the visionary and speculative tradition in architecture is surely the one where the computer has the least advantage over the paper sketch. As the Mies study shows, it cannot produce an idea at anywhere near the speed of the pencil stroke; and, as all these studies show, it can as yet capture

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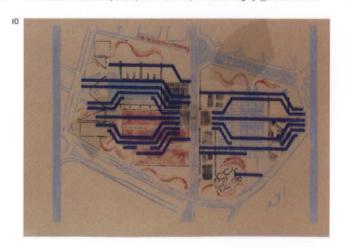
none of the idiosyncrasy and character, the sense of haste and uncertainty, or the specific clues and coding of a designer's instructional language to which draughtspeople and modelmakers can respond. Indeed, one hopes it soon may — as the generations brought up to visualise matter on a backlit screen in a vivid palette improvise an approach to lines on a monitor that undermine its graphic conventions and visual neutrality, and once again escape the uniform language that comes with a new technology, as Piranesi did with the etched plate, Schinkel with the steel engraving, or Mies with the photomontage. There are, however, other ways in which the virtual world may be transforming architecture, and those may be fundamental.

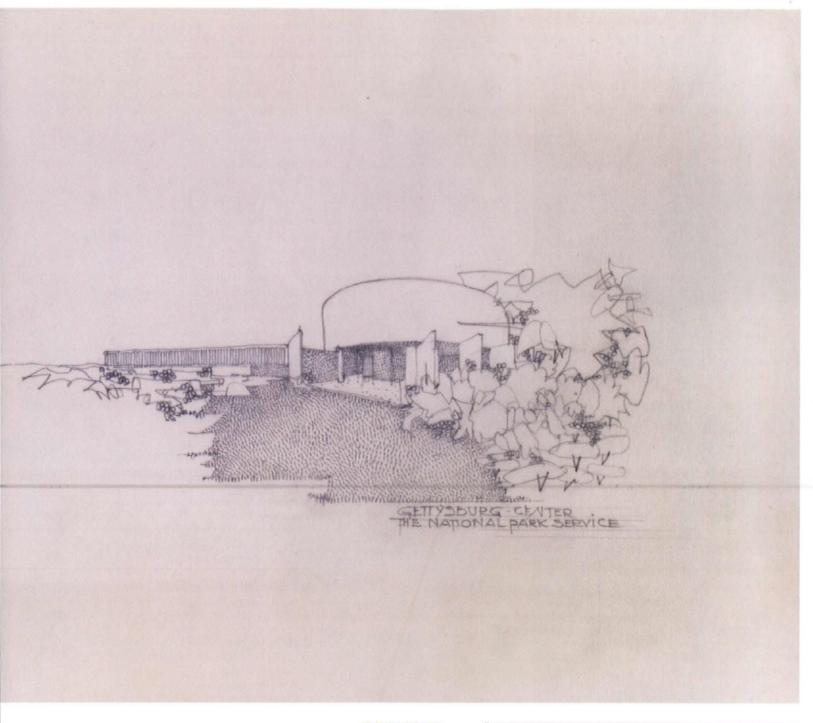
Expanding consciousness

Forty years ago, in the first essay of *In Bluebeard's Castle*, George Steiner showed how in the space of a single generation the penny post, the railway, the telegram, and newsprint – along with the rapidly lengthening span of life itself – shifted our scale of time and changed our sense of its pace. In architecture, it was the dawn of the age of the mass-market published review, in which new work anywhere could be seen everywhere, and its ultimate products were the standardised plan and the mail order dwelling. Now another sea change in our consciousness is surely coming as we move from machines with no mind and a definite geography to those with memories larger than ours inhabiting a space vaster than we comprehend.

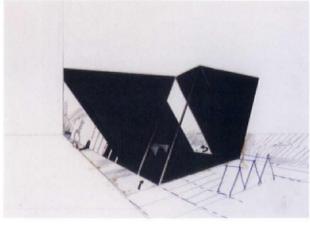
In such a phase of mind, I can envisage living in a more visible version of the virtual world in which Ugo La Pietra saw us dwelling 40 years ago, when he proposed a simple cell for living in which all aspects of a common urban life — a city at large — could be enjoyed by telecommunication without us ever leaving its walls. That is the phase of mind for which Diller + Scofidio built in proposing their Slow House, focused on a great vista that was simply recorded on a TV screen; their New York brasserie, whose sociability was engineered by a delayed live-cam of people walking in; or the 'Blur' on Lake Neuchatel in which the then-vaunted physio-phenomenology of atmospherics — an entire poetry of space — was fabricated by steam machine.

Again, I am loath to look at this with alarm, when I think of the Wunderkammers of earlier times, in which all the material universe could be experienced in a single room; of the hermetic nature of a philosopher's garden; Ior the Enlightenment maison d'un cosmopolite, where a virtual cosmos would be encased in an illusionistic livable sphere. Like them, we may undertake some follies as our consciousness of virtual and real, actuality and metaphor becomes blurred, and, like them, we'll simply get over it.





9. Richard Neutra:
Gettysburg National
Park Visitor Center, ink
perspective presentation
for publication, 1961
10. Cedric Price:
competition proposal
for Parc de La Villette,
Paris, print and coloured
mylar montage for
presentation plan, 1982
11. Ugo La Pietra:
Cellular House, exhibition
presentation perspective
in collage, 1972.
All drawings are courtesy
of a private collection



ARCHITECTURE & REPRESENTATION

COMPUTERS IN THEORY AND PRACTICE

A landmark new exhibition at the Canadian Centre for Architecture unearths the digital pasts of architects Peter Eisenman, Shoei Yoh, Frank Gehry and Chuck Hoberman. Exploring the particular story of four projects, taken together they show how the computer has radically changed architectural design for ever, argues *Tim Abrahams*

The compulsion to think of architecture as a computer might is far older than any notion of designing with one. Architects came to work with computers having developed ideas in parallel to the work of those who established the field of computing. For example, in 1967 the Centre for Land Use and Built Form Studies (LUBFS) was founded in the Architecture department of Cambridge University by Lionel March under the direction of Leslie Martin. March had arrived in Cambridge to study mathematics with a recommendation from the computer scientist and codebreaker Alan Turing, but had moved to a joint degree in mathematics and architecture. Sean Keller, author of the upcoming book Semi-Automatic: Motivating Architecture After Modernism, has suggested that this was part of a process that included the assimilation of architecture schools into universities in the United Kingdom and the introduction of A Level requirements for the study of the subject.

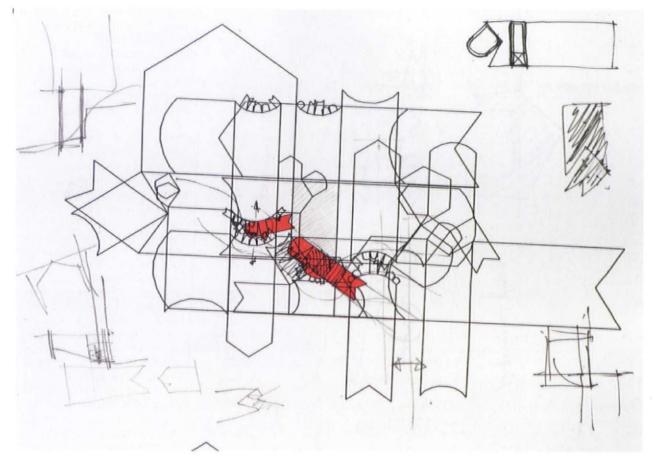
As the postwar welfare state was built, Keller suggests that Martin in particular saw the need to prove that architecture was as rigorous in its technical requirements as engineering and planning. Under Martin's encouragement, March explored how advances in mathematics such as computing and artificial intelligence could inform the work of the architect. He pursued a range of study areas, similar areas of interest to the New Brutalists, such as using graph theory to test new arrangements of rooms in a house; modelling pedestrian flows; generating new unexpected adjacencies in domestic layouts: and making maps of population distribution in urban areas drawn through probability from small samples.

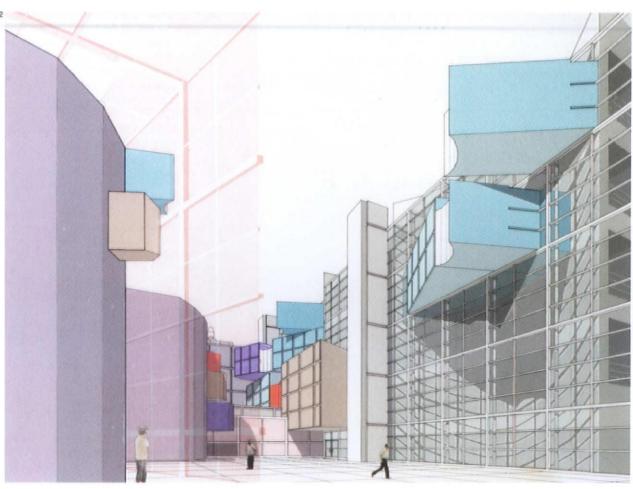
In an introduction to an issue of Architectural Design from May 1975 dedicated to LUBFS work, March wrote: 'We do not consider computer graphics to be very important: although the facilities are at our command should we need them. Making computers do what architects do and think today is like using a steel frame to support a mock gothic building. Fundamentally computers will not change design methods but theory will.' Although the issue is packed full of formulae and diagrams rather than plans and sections transcribed from computer analysis, March is keen to emphasise the role of the architect while playing down the importance of aesthetics. It is not the look of computer-designed buildings that is important. Paramount is the manner in which the computer's aptitude for analysing spatial adjacencies and flows of traffic between them informs architecture.

The modest premise of the Archaeology of the Digital exhibition1 at the Canadian Centre for Architecture is to analyse the way in which computers were incorporated into the design process of four projects; but the wider ambition is to show how this process changed both computing and design for ever. A primary impetus for the show was the practical need to preserve digitally native architecture for a wider global audience; to extract the information created in long-forgotten software packages on hard drives; to store it; and finally to think about how to display it. However, this very technical process of excavation also occurs at a moment when there is a wider cultural need to accept the reality of digital design: to understand it as a cultural reality rather than as an empty promise of utopia which can easily be turned into a straw dog by detractors. According to Greg Lynn, the curator, 'Now is the time when we can stop having discussions about digital technology that start with "in the future" ... What this show is about is saying, "In the past, digital technology did this"."

PETER EISENMAN

I. A study plan for the Biozentrum or Biology Centre that Eisenman designed in 1987 for the JW Goethe University in Frankfurt. Eisenman says that his point of departure was not the parti but the diagram – specifically the morphological diagram 2. A computer-generated perspective of the unrealised Biozentrum





Of course, a great deal happened in the evolution of architecture and computing between March's time and the point at which architects actually used computers regularly for design work (the CCA's period of study). In March's time, it was not seriously considered that computers would ever be in the hands of the average architect. They were expensive structures built for use by the military and big science and architectural researchers were lucky to get time with them. The early British contribution to the theory of computing in architecture is outside the remit of Archaeology of the Digital. It was not until the mid 1980s, at the very earliest, that we began to see architects work with computers and that is the first reason why the CCA has lighted upon the apparently disparate work of Peter Eisenman, Frank Gehry, Shoei Yoh and Chuck Hoberman.²

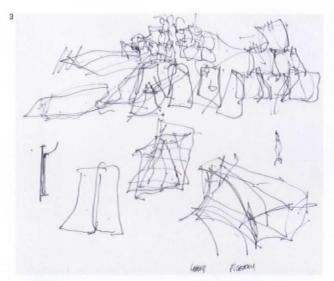
By this time, the theoretical implications of computing first prompted by March and Martin — but spreading quickly to the United States in terms of planning and building form — had in fact quietly made an impact on the way architecture was drawn and conceived. The rise in use of the typological diagram from the mid-'70s onwards, I would argue, is evidence of this change of perspective.

The work of Peter Eisenman, included in the exhibition, is another example. Eisenman, of course, studied at Cambridge before the establishment of LUBFS, but under the directorship of Martin. Later in life, he argued (in AD in September 1992) that the digital had prompted a rethinking of perspective. Brunelleschi's invention of one-point perspective corresponds to a time, he wrote, 'when there was a paradigm shift from the theological and theocentric to the anthropomorphic and anthropocentric views of the world'. Quoting Deleuze he argues that the totalising nature of this latter view should be questioned by 'the fold'. This Deleuzian fold allows the architect to escape the totalising nature of his planimetric view. Although Eisenman was quiet on the moral and social reasons as to why architects should adopt this perspective, the article is an expression of how the digital has informed the way we view the world.

It is Lynn's proposition that these four pioneers of computing in architecture went to the computer with specific needs and in doing so created four very clear strands in the evolution of architecture. In Eisenman's case, it was the need to take a device - namely the structure of DNA - and create a diagram for a building from it. The simple idea that Deconstructivism was an extrapolation in architecture of Cubism is not the full story. Eisenman was interested in applying an idea of language by creating a project in which buildings' scientist-users could read the DNA of the building. Working at Ohio State University he approached the computer department to produce iterations of the DNA sequence to create a diagrammatic plan of the building. The abstracted diagrams were sent by FedEx (in the year that FedEx launched) from Ohio State to New York, annotated by Eisenman and redrawn in his office, and then returned to Ohio State for further iterations to be generated.

Computing aided Eisenman's search for a deep structure. His use of the computer as a technique is

'These four pioneers of computing in architecture went to the computer with specific needs – and in doing so created four very clear strands in the evolution of architecture'



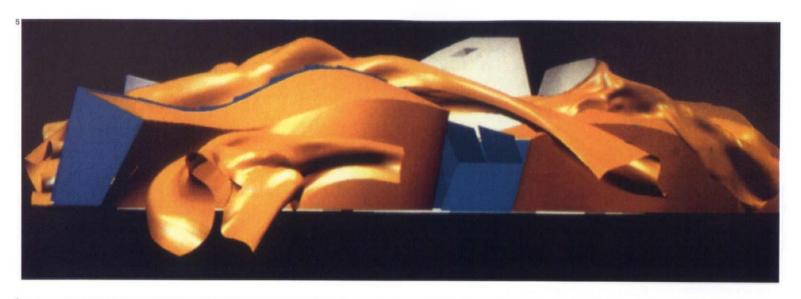
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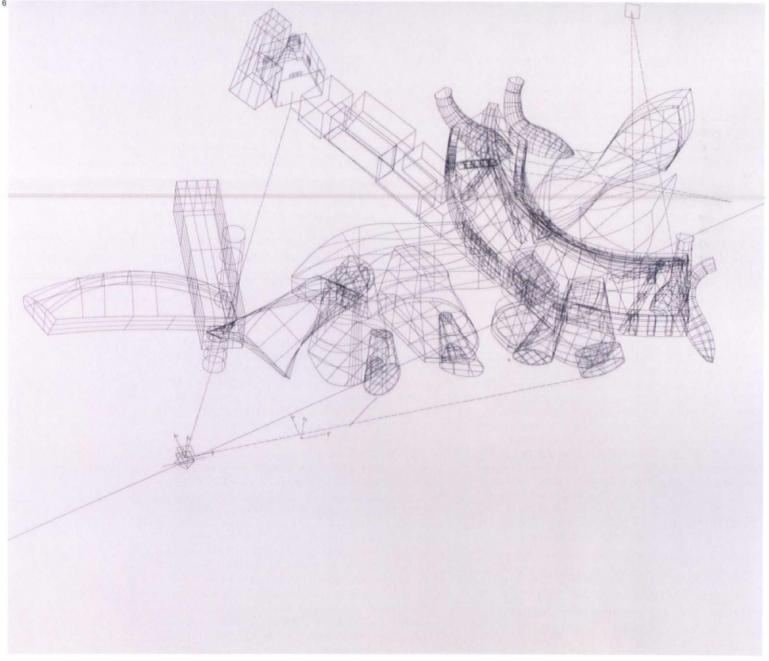
3-6. The Lewis House had a painstaking design process that lasted from 1985 to 1995. It took in hand drawing (3), physical modelling (4), computergenerated massing that may have informed the metal skin of the finished building (5), and wire frame modelling (6)



a strategy analogous to the process by which DNA sequencing occurs - a process that was initially chemical but by the mid-1980s had become semi-automated. The importance of the CCA's archaeological approach is revealed in this project. Eisenman insists that his approach was intuitive, pragmatic. In an interview with Greg Lynn, he said 'I was teaching at Ohio State, I had this job to do at Ohio State. Chris Yessios was teaching computers. I didn't know what that was. And I am not sure he knew what it was, either, by the way. And I said, "Hey, Chris, you could really help us. We don't have a way to model the things that we want to do. And if you are interested in 3-dimensional modelling, which is what you say you're interested in, develop something that we can use." From this dialogue, Yessios would go on to set up FormZ, which is not only now used in 3D computer modelling for architecture but also in Hollywood for animation purposes.

It also changed the nature of architectural representation in terms of typology. In hindsight Eisenman sees his early use of computers, and in particular the competition entry for the Biozentrum (the Biology Centre for the JW Goethe University, Frankfurt, which was designed in 1987) as part of the evolution of a core principle of his architecture. It was a means for him to develop a particular kind of representation. '[Colin Rowe] wasn't interested in the diagram. He was into the parti, and the parti, of course, is compositional. I was interested in something other than the parti, which is the diagram, but the morphological diagram as opposed to the typological. Of course, Rem [Koolhaas] is interested in the typological diagram. I'm interested in the morphological one; the one that generates form. And I think this is where Colin and I split over parti versus diagram,' he says, referring to





the period when the Biozentrum was developed. Through dialogue with the computer a key organisational principle which can be repeated and adapted emerged.

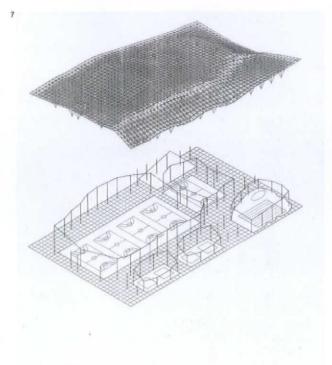
Gehry's use of computers is famously more extreme. Here is the copyright holder of a proprietary software that is used throughout architecture who describes his one direct experience of designing with a computer — the initial stages of the Lewis House — as 'excruciating' and like 'being trapped in a vice of pain'. Yet the Lewis House's long evolution from 1985 to 1995 began with physical models, which were then digitised. The digital files were then worked on and 3D prints, deposition models and solid laminate models made from them. Gehry took a soft felt material and hardened it with wax, based on some of those models. He then scanned and tried to rebuild them. As Lynn describes it, 'it's a very rich exchange between physical model-building, drawing and digital modelling'.

It is Lynn's contention that the four designers included in the exhibition go to computers to find a solution to a problem. Gehry, self-effacing in a similar way to Eisenman, insists that he went to it to solve construction problems. Having drawn a previous project using descriptive geometry, Gehry was disappointed to find inconsistencies in the final build. He approached his employee Jim Glymph to solve the problem. Glymph went to the software CATIA which was being used in the aircraft industry and Gehry's team worked in-house to give it a graphic interface that could be used in architecture. This proved its worth with the Barcelona Fish, compared with AutoCAD which was being used by the executive architect.

Gehry compares his work to that of artists, such as his friend Richard Serra, who were seeking a way of making sculptural work at an urban scale, resisting the urge for expressive work to be reduced, as he puts it, to being the 'poop in the plaza'. Gehry suggests that the software merely gives him the opportunity to sketch and model as he would wish, then scale up. And yet as the Barcelona Fish makes clear, there is a continuum between the structural advantages of CATIA which could be easily used with steel production, and the lustrous finish that could be achieved again in metal. It is nigh on impossible to say what comes first: the lustre in the graphic interface of the digital surface or the metal surfaces that would invariably clad the steel substructure. Lynn describes seeing the Lewis House for the first time and seeing it as 'native computer'.

If the historical association between computing and architecture (which began in Cambridge and later moved to the US) was an attempt to assert the scientific nature of architecture, it is ironic, then, that Gehry operating in a counter-direction – drawing architecture to art – should become one of the most successful users of computers in architecture. He describes how Serra looked at a typological model in his office for a tower block in Hanover and asked how it was going to be made, subsequently using the technology and staff that Gehry was using to create

'If the historical association between computing and architecture was an attempt to assert the scientific nature of architecture, it is ironic then that Gehry operating in a counter-direction — drawing architecture to art — should become one of the most successful users of computers in architecture'



SHOELYOH

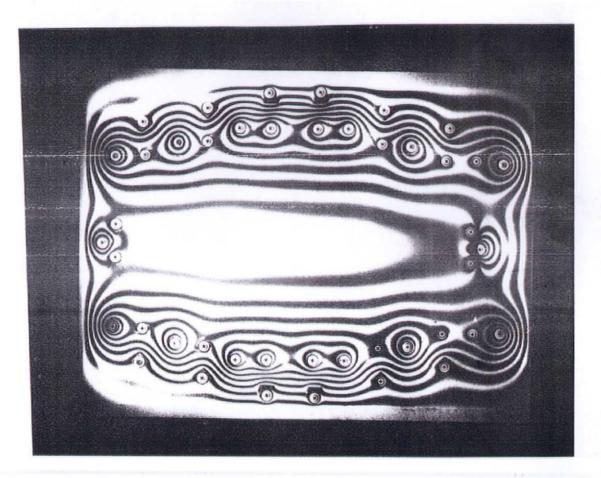
These experiments in stress point modelling are some of the first to be generated on a computer 7. An exploded wire-frame model for a roof for a gymnasium in Odawara 8. A photoelasticity model for a roof for Yoh's Galaxy gymnasium in Toyama 9. A wire-frame model for the same structure

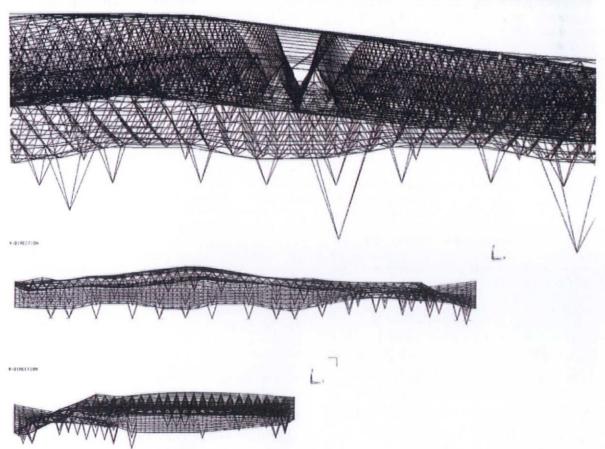
similar torqued pieces. Today Gehry sees the artists gaining the upper hand. 'What's happened is architecture has backed off the sculptural edifice from some kind of embarrassment,' he says. However, he insists: 'there's a need for it, and so cities are hiring the artists to do it now', and points to the ArcelorMittal Orbit as a case in point. (The unapologetic way in which Gehry sees Anish Kapoor addressing a 'need' – and what that 'need' actually is on a political level – partially explains the critical outpouring against the project.)

In this magazine in February 2012, Patrik Schumacher stated that architecture 'should be sharply demarcated against other competencies like art, science/engineering and politics'. It was the last in the list that earned him the opprobrium of other commentators, showing that we live in an age when architectural debate is almost exclusively focused on working out the discipline's relationship to politics; to such an extent that we are blind to its relationship to anything else. Of course, it is only in the UK that both traditionalists and left-wing critics started reaching for the bricks when they heard the word Parametricism (not to throw them of course but just to reassure themselves of their rectilinear form).

Lynn believes that Eisenman is the inventor of the parametric approach to the computer — much, it must be said, to the bewilderment of Eisenman. However it is the Japanese architect Shoei Yoh who Europeans would more readily recognise in this role. Lynn's point about Eisenman is that he uses, repeats and adapts an architectural idea, different from the structural repeat and adapt that you would associate with the work of European practitioners like Kas Oosterhuis. Architects like him have explored the possibility of computer technology to create established relationships in a computer model with similar members. The model can then be adapted, and following the determined relationships, individual unique members can be specified and then sent to manufacture as unique parts with their designated place in assembly.

Yoh championed this while working in relative isolation in Japan, developing it with a German manufacturer,





'Architecture — and Hoberman's designs particularly — represents an important staging point in the history of technology throughout the world. Hoberman's models and drawings stand at a very clear juncture between big science and big art'

although he was later invited to Columbia when Bernard Tschumi was developing his paperless studio projects. Yoh initially began on wooden structures but moved into steel for his roof structures on Odawara (1991) and Galaxy Toyama (1992), creating three-dimensional trusses of varying depths, with different sizes of steel tubes. Tellingly he studied economics before architecture. His argument would be familiar to anyone studying at the Architectural Association five years ago — it's a rethinking of Fordist mass production and the introduction of the computer which 'helps making all different kinds of shapes, length, angles, so the production cost does not exceed our budget'. Except Yoh was developing this in rural Japan in the '80s.

Yoh's early use of computer technology means the work he produces is akin to the punch-hole schematics used by Lionel March. They are some of the first computer models that exist not simply to create form but to test a project to be built. In the computer test model, the manner in which the points of stress were identified developed its own aesthetic. It is an adaptation of Frei Otto's experiment with soap bubbles and the way it pointed to key organisational relationships in structure (although Otto was also making a point about urban planning). The representation of these stresses in computer modelling shows the curved forms that digital architecture was most closely associated with, certainly at the turn of the century.

Chuck Hoberman was interested too in using software that could generate small parts with tiny variations; yet Hoberman's importance derives from his need to make software which could design moving parts and which could therefore represent an animated structure. In the 1980s, Hoberman was using AutoLISP, which is an expression editor in AutoCAD, to look at how moving parts would interact with another moving part. At that time aerospace software like CATIA would have cost \$50,000 for a licensed platform. Hoberman was using AutoCAD to invent a way of looking at moving parts without anyone showing him how to. Far more than the other architects, the still images of his work do not reflect the way in which he designed.

Hoberman's story shows the proximity of architecture, through computing, to the grand technological narratives of modern American technology. His architectural pieces emerged in part from working with NASA on their 'deployable structures programme'. 'Rather than constructing a structure in space, you would unfold a structure in space,' says Hoberman. He worked in the same manner as a Silicon Valley start-up with his partner Bill Record who had a company called Zengineering where he refurbished digital machining centres. Record would program in G-code, a programming language used in automation to make these parts. Hoberman would create a front-end software so that his designs could flow seamlessly into this machine.

From this backwoods coding emerged the dynamic software that Hollywood took to, and it created a huge driver to the development of the software used today. Hoberman's attitude captures the ambivalence of the profession: 'on the one hand, I love that capacity to create visions and see them do all kinds of imaginative things and it revolutionises our perception of what's possible. On the other hand, I was on the side, saying: "Yes, but I do special effects in real life: they have to work".' Architecture — and Hoberman's designs particularly — represents an important staging point in the history of technology throughout the world. Hoberman's models and drawings stand at a very clear juncture between big science and big art.

In his books, The Net Delusion and To Save Everything, Click Here, Evgeny Morozov has launched an attack on what he calls 'solutionism' - the idea that given the right code, technology can solve all of mankind's problems. Taking aim at the rhetoric of Eric Schmidt, former CEO of Google, in particular, he argues that this drive to make government 'open' actually conceals an emphasis on limited technocratic issues rather than wider democratic ones. For their part, the tech giants point out the very real improvements they can make to people's lives, in accessing information. The debate notably does not take place around the historical achievements or shortcomings of information technology, but around potentials. Can smartphones encourage people to vote? Should they? These speculative, rather arbitrary questions characterise the current debate.

Part of the impetus for the CCA's work in computing is to ground this argument in regard to architecture.3 It is worth bearing in mind that two of the projects in the current CCA exhibition played key roles in the formation of software tools that architects use today. To understand the role that architects with divergent needs and requirements played in the formation of the tools we now use, it is vital to understand that they went to computing with ideas, not yet fully formed, about what they would be able to achieve with them. As Lynn remarks: 'what's interesting about these four is that they knew what they wanted before they started, and they went to people with an intent and used the software as best they could to achieve their intent'. The drawings they produce offer extraordinary unexpected answers.

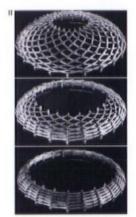
The exhibition Archaeology of the Digital is at the Canadian Centre for Architecture in Montreal from 7 May to 13 October

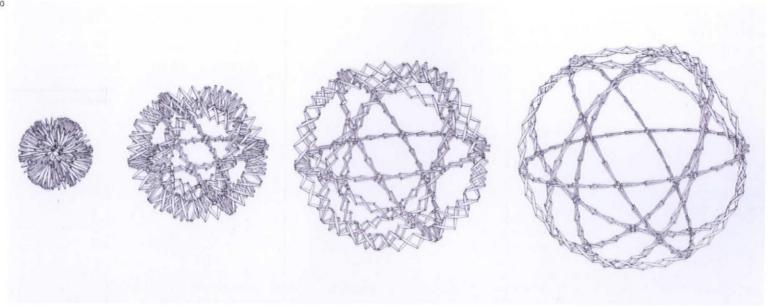
1. Archaeology of the Digital, Canadian Centre for Architecture, Montreal, 7 May - 13 October. Further exhibitions in the field are planned for 2014. For full information visit www.cca.qc.ca 2. Mirko Zardini, director of the Canadian Centre for Architecture, believes that this period has further significance: 'During these years, there was a clear rise-and-fall in the importance of critical theory in architecture which gave way to an emergence of technocratic thinking. At the same time, this era was marked by a disappearing interest in the "public" component of architecture which, interestingly enough, corresponds also to a period of intense public and social reforms, mostly in European states.'

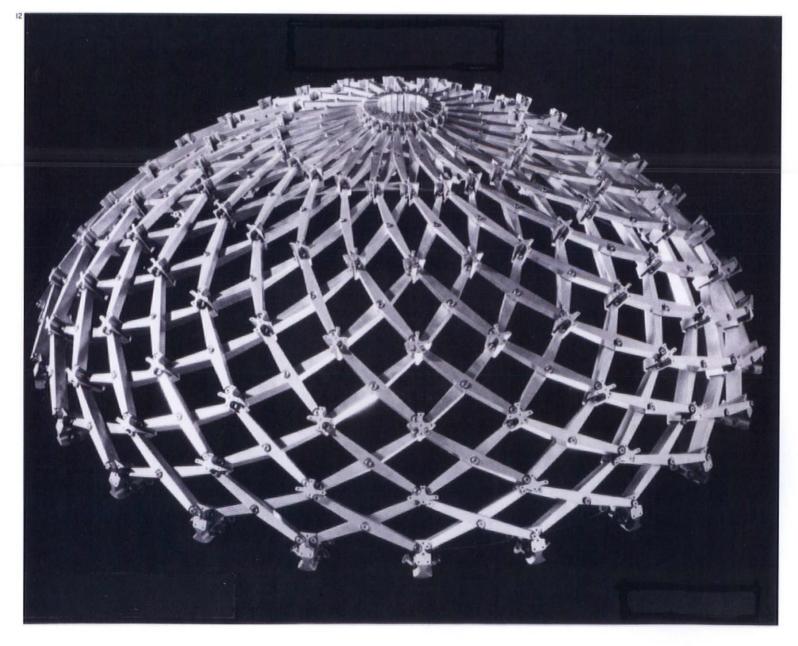
3. The CCA's initial examination of early digital experiments in architecture began in November 2004, with a seminar entitled Devices of Design — in collaboration with the Daniel Langlois Foundation. The scope of the meeting was practical; a means of investigating the different strategies deployed by architects during the 20th century and beginning of the 21st century for ways of imagining and building architecture. Following this seminar was a more specific research project by Greg Lynn entitled the Embryological House, which was a rethinking of the manufactured house, from the Modernist idea of a form based on parts and modules, to a new one, based on unlimited iterations deriving from a 'primitive form'. From here, the CCA began to fully engage with how it might work with digital material.

CHUCK HOBERMAN

IO. Using AutoCAD,
Chuck Hoberman designed
an Expanding Sphere
that could be unfolded
in space by NASA
II & I2. He also produced
scale models with hinged
joints to demonstrate the
erection of his Iris Dome



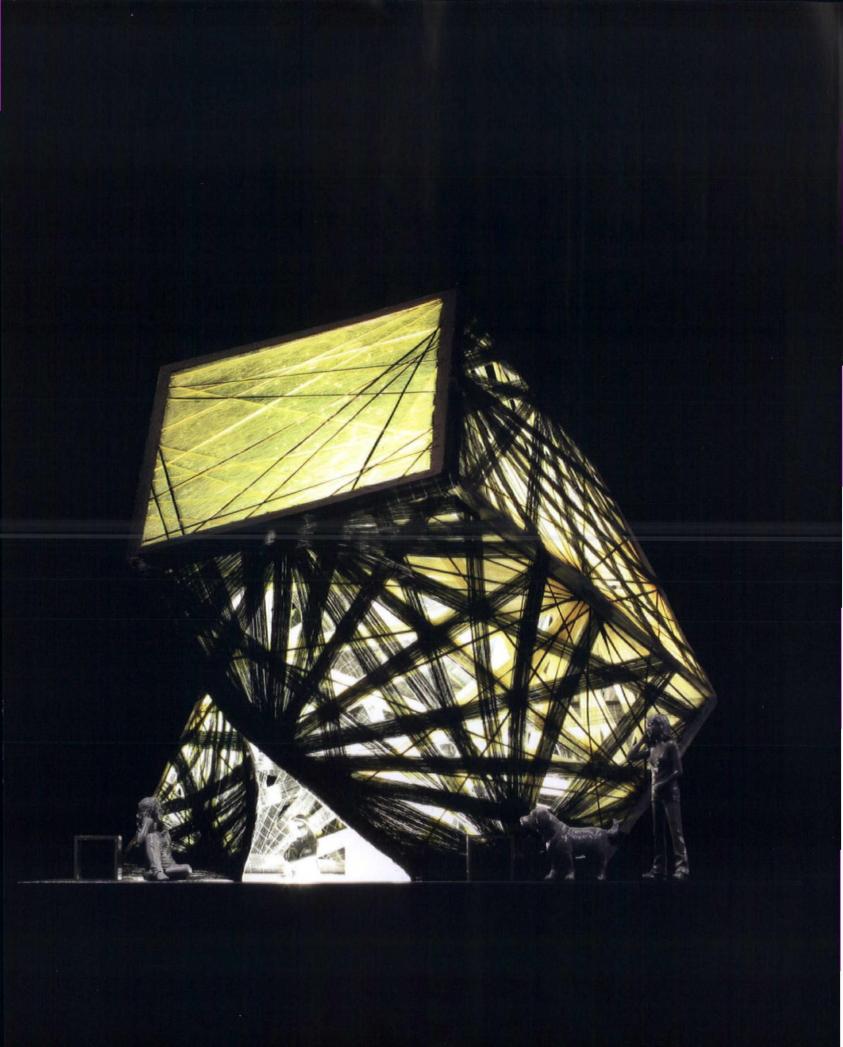


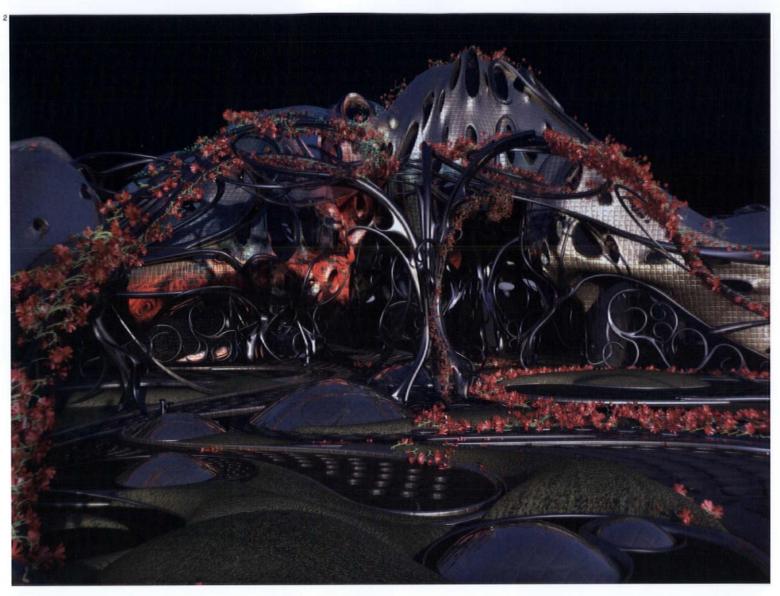


I. Render of The Textile Room, MOCA Pavilion, by Marcelo Spina. The structure, developed in partnership with North Sails, is of yellow aramid and black carbon-fibre tape, infilled with translucent resincoated tow panels

The Dean of SCI-Arc *Eric Owen Moss* interviews Hernan Diaz Alonso and Marcelo Spina, two members of his faculty, about the fluctuating relationship between radical architecture and the tools that give it shape

THERE IS ALWAYS A HISTORICAL MOMENT WHEN TECHNIQUES AND METHODOLOGY INFLUENCE CULTURE





Marcelo Spina directs his LA-based practice P-A-T-T-E-R-N-S with Georgina Huljich. The duo have won numerous prizes and have built pavilions for MOCA and SCI-Arc. Hernan Diaz Alonso's office XEFIROTARCH is also based in LA, and he built a pavilion for PS1 in New York in 2005. Spina and Alonso are part of a new generation of architects who have rejected hand drawing in favour of digital techniques. They are interviewed for the AR by distinguished architect Eric Owen Moss, creator of many buildings in Culver City and elsewhere and dean of SCI-Arc (where they both teach).

Eric Owen Moss The first question has to do with stages of evolution in the development of design ideas, and the design tools used to implement the ideas. As a primitive example, let's assume someone said, 'OK, here's a rock. Let's pound these sticks into the ground to hold up the tent.' And someone eventually responds, 'This is a pain in the neck. How do we make it easier?' And the rock tool evolves, over millennia perhaps, to become a hammer.

The developmental stage ends. How the rock becomes a hammer? That's a subject.

Once the tool is available, the next group isn't burdened with tool conception. How do they extend its use? That's a subject.

By extension, in the developmental stage of digital tools, what was the inventor's itinerary before there was a Rhino menu? When the architect imagines something he doesn't quite know, with no a priori menu of options, he invents a way to represent and to implement what's represented or the conception dies. So there's an interrelationship between conceiving a form, a space, a shape, and inventing the means to deliver the conception. And that job is different from that of the next generation which now owns the tool. The next group doesn't invent it. Instead, they have to learn it.

Let's talk about this chronology of invention, and how the imagining of an object we don't yet know, in a time when the tools don't yet exist, is different from designing and building the identical object years later when the tool is known.

Marcelo Spina I think there is an obvious difference between when the tool exists and when the tool doesn't exist. Who produces the object before the tool's design? Who does it first? When it comes to radical work, there's a huge difference. I think the parametric capacity, when it comes to producing thousands of drawings that are slightly different but that all share a typical aspect of joinery, for example, is undeniably essential. It changed the construction game. To locate parametrics with respect to the generation of the work, how to represent the development of an idea, when it's not yet clear how it's going to be imaged and built or if it's going to get built, which may be determined based on what we are able to represent - is a very different discussion.

EOM Do you have an obligation with the digital tool to extend the meaning or purpose of the tool; so that as each architect handles it, he doesn't simply pass on what was given to him, but has an obligation to rethink it? I mean, in the same way, somebody could sit

here 10, 15 years ago, with a parallel rule and a couple of triangles and produce (or not) a predictable Hitchcock-Johnson redux of a modern architecture vocabulary. The modern language, one could argue, comes directly from the tools used to represent it.

Now there are exceptions to that, and that's what we're wondering about. Mendelsohn is an exception, or Gaudí. The usual tools and rules don't account for their work. But, generally, the advocacy has a kinship to the tools that are used to implement it. And if Mendelsohn is sitting in the trenches of Verdun drawing these funny little sketches that don't depend on a parallel rule and a triangle, is there an analogue digital development stage?

Hernan Diaz Alonso I think it's wrong to assume that digital and software tools are stable. The tools are always in flux.

EOM For you or for everybody?

HDA For everybody, at least in the ideal sense. I'm not saying that's always the case, but I would argue that the body of work the people in this room are interested in is always changing and always challenging the limits. The tools change what the limits are. Something that three years ago you couldn't build and now you can implies a continuing process of improved capacity indefinitely. No reason to assume you will build the same thing 20 years later. The tools are the means to start to think about new ways to challenge what the tool can and cannot do.

I think that the discussion with relation to tool capacity has always been there. I mean the idea that some architects are comfortable with the status quo doesn't preclude a

2. Render of the Patagonia **Museum Pavilion project** by XEFIROTARCH 3. XEFIROTARCH's Sur Pavilion, PS1. Alonso has spoken of his interest in sci-fi movies and **Matthew Barney**

continuing challenge. The other part of the argument is that some of these tools are not only vehicles for production, but what I would call a way of thinking differently about the work. For us digital tools remain fresh and renewable.

EOM Can you give me some examples? There's a pivot point in the history of technique which has to do with the representation and related sharing of documents, and engineering, fabrication, construction, all of that. That's clearly changed. It went from an established way to a disestablished, experimental way ...

HDA ... To stable again.

EOM So are we now re-established with an analogue of the 'Hitchcock-Johnson' pro forma?

HDA Yes. And the hope is we will find new ways to make it unstable again. Especially, for example, if we go outside architecture like in the late 1980s and early '90s, when the discipline started to flirt with tools coming from movies, animation, video games and so on. Those tools were added to the architect's repertoire, got re-adapted, then outdated. Software like Rhino came later and it became like the latest applications of a continuing speculation. CATIA too, all those options. Now, if you look at the evolving history of the shape discussion that goes from the beginning of people who were working with simple geometries to plane curves to discontinuous surfaces. Then we move into polygons, then subdivisions of polygons that we can connect. At the beginning we couldn't connect the pieces. Now you can. Then parametrics and scripting arrives to again

diversify for a moment. And next come the robots, and the robots are again destabilising. So, my sense is, yes, digital tools have created a new plateau. Digital tools created a whole new series of agreements in terms of sharing information, which I think has now been clearly established.

I would argue that there are certain parameters that are more cultural than technical. You can think about a new philosophical perspective in the Renaissance, for instance. It changed the architectural premise. Another example is the body of work that was triggered in the '50s and '60s that I think influenced people like you and Thom Mayne, through axonometric representation. So there is always a historical moment when techniques and methodology influence culture, and the culture argues for a new body of work.

What is fundamentally different at this particular moment is that our intellect or the cultural aspect of the practice and the practical applications are much more in sync than they were during the axonometric era. Let's say Stirling, for example, designed using axonometrics, but he couldn't build it through axonometrics. Today we have a much more direct correlation between digital representation and construction implementation, and I think that is a fundamental change.

EOM I don't know whether the explosion of digital capacity actually has narrowed the intellectual perspective on architecture and focused attention on a relatively narrow venue - engineering, fabrication, and construction capacity. Is there a correlation between a new representational capacity and what you refer to as a new intellectual/cultural point of view?



Are we stuffing into odd shapes what we used to stuff into even shapes? Or is the programmatic content evolving too?

MS The problem for me is that you have the technical means, software means. You have the calculus to allow others to share and understand content — engineers, contractors, fabricators. But it's still pretty difficult. Second, not everyone is interested in doing the same things. So, I think the problem of the relation to content is very much at stake in relation to differing individual points of view. It takes a while to kind of get acclimatised to a certain set of tools and that, at least initially, creates a myopic relation to broader content. At first the tools have to be mastered. Then you can begin to discuss new content and history.

EOM Let's say 60 years ago on Park Avenue, Mies puts up a building, and the argument for the programmatic content of the building is essentially orthogonal, gridded space — open, flexible, changeable, malleable. The theoretical argument is that any undue spatial complexity would compromise flexibility over time. You don't like the space or its subdivisions, you move them; you want it open, people connected, OK; you want it closed, OK.

MS For many people that concept still holds today. That's not a battle that has by any means been won or lost.

EOM Now let's take a digitally invented tower in Singapore. The elevations dance. Mies is gone. Let's say the elevation of the tower is kinetic, changes from hour to hour. We've built a clock/calendar that responds very

precisely to its environment. The case for variability is the opposite of Mies's flexibility argument. Now, instead of right-angled, gridded neutrality, flexibility means the opposite, an idiosyncratic shape. Now the argument is that digitally enabled specificity negates the requirement for future flexibility.

So shape variability, it's argued, then allows you to accommodate a range of different uses and sizes, different apartment types, for instance, as the tower undulates in and out. What happens if everybody wants a two-bedroom? The Mies argument was perhaps disingenuous. It really had to do with a predilection to representational and constructional tools and methods. The Singapore Tower image is also a conceptually disingenuous argument. The digital tool allows you to make shape and space, which we rationalise in terms of a plausible, flexible human purpose. I'm not sure you can trust either one of those arguments.

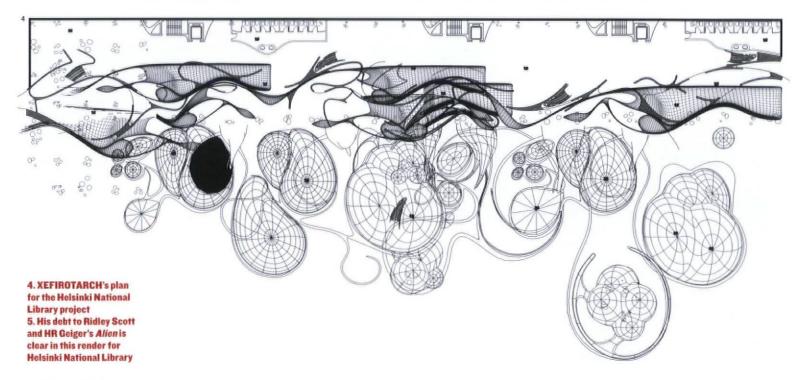
MS I know it's important from the pedagogical point of view to discuss these things, but I always associate the answers with a personal, core set of beliefs on what architecture should be. I don't think we should all necessarily do different work as a consequence simply of the availability of different tools. You probably will build differently. You probably will communicate differently. You'll probably work longer hours because there are more options. But I don't think the relationship of tools to design content can be generalised. I have a problem with the argument for greater efficiency or higher performance levels strictly as a consequence of new tools. I don't agree that a concept should exist simply because the tool allows it. The architect is delivering on

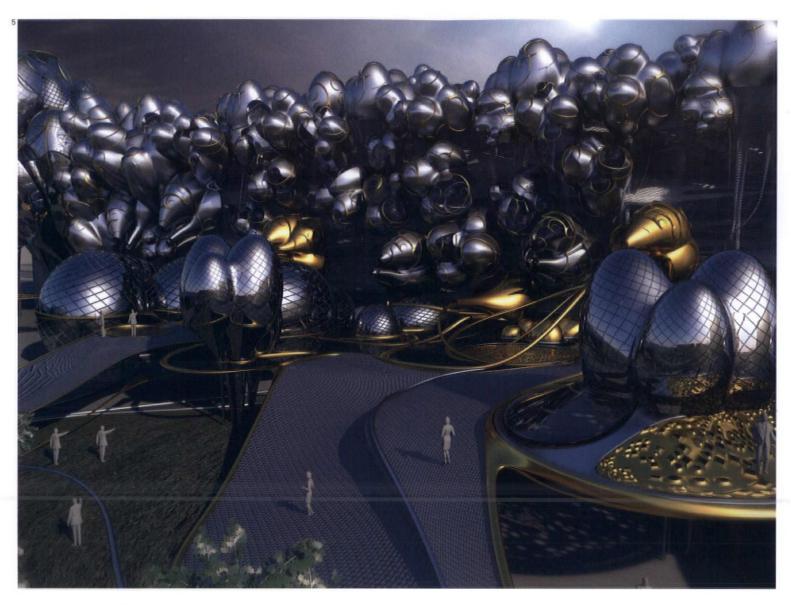
a set of core beliefs. The new image should belong to the a priori belief system that precedes the enabling capacity of the tools, not that follows the enabling capacity. Unfortunately the latter is often the image of contemporary work: that it's simply derived from the new tools.

EOM I'm asking if the content drives the tool somewhere the tool wasn't intended to go? Or, more disingenuously, even though you claim the content is driving the tool, isn't the tool surreptitiously driving the content?

HDA I don't agree with Marcelo's assessment. I think there is a direct correlation between the tool and the final outcome. I don't think it's disingenuous. My point is, if you think about music, the sound of the Beatles or Jimi Hendrix would not exist without electric guitars, amplifiers and wah-wah pedals. The musicians would be great. They would have done other music. The aesthetic sensibility would be different without those tools. So the tools at any particular time enhance, change or define the content of that time. So if we are sophisticated, we try to merge or create a friction between our individual desires and whatever tools are on hand.

I think you can define tendencies in architecture and art based on the representational tools available at the time. If you take the example of Patrik and Zaha, I would argue there is a radical difference between the work of Zaha Hadid as a painter, Malevich style, and the introduction of the computer and Parametricism. It's not the same. If you take the Vitra Fire Station in Weil am Rhein, the project was based on fracture and a clearly different sensibility delivered by the new tools.





MS It's true that tools evolve and the work evolves. But it's also true that we all use the same tools but produce very different work.

HDA I would say that the work I produce today is heavily driven by the tools. If I were not using these tools, my work would be different.

MS If you're going to try to tease out the subtle relationship between tools and one's own work it's an intersection between core beliefs and tools. Sometimes core beliefs change as a consequence of tools.

HDA There is a down side. There is also a McDonald's version of your work — a version any mediocre corporate architect can reproduce. That's a problem. Then the tools do take over, and the tool is identified with certain formal preconceptions. I would argue the same is true with music and film.

EOM It's interesting that the tool can be understood as a means to efficiency as well

as invention. To be fair, the new tool has an interesting neutrality which facilitates, in some hands, a cheapening of the work – even more austere, even more efficient, and even more penurious. You can go back today, for instance, and rebuild the Seagram Building using Revit.

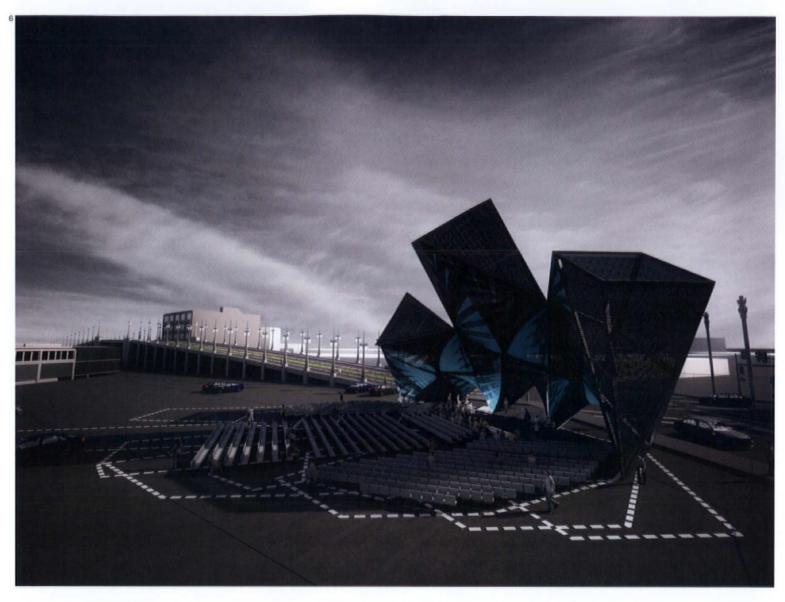
HDA Yes, and many do just that.

EOM And AutoCAD too can be an efficiency tool. You can see the variability of production options in terms of how the tool is applied. And what we are supportive of is an inventive minority and how they apply the new tools, as opposed to how they're generally applied in architecture and engineering.

HDA I agree, but I will say redundancy and repetition occur with or without the tool discussion. Item one: Mies makes the Seagram; item two: 40 years of boxes from SOM. They're not the same thing. One thing was Seagram and Mies and conceptual 'neutrality' as a design goal; it's another thing to take that design hypothesis and make it into a style or an efficiency type. The problem remains. It's a fundamental problem in architecture.

an early 20th-century reaction to, for instance, the Neo-Classicism of McKim, Mead & White. To make a box, let's say in 1915 or 1920, was a search for a new archetype for public architecture in America. It was looking to replace the Boston Public Library — McKim, Mead & White, which had a big reputation in Boston, the centre of American culture. To make the box 100 years later when the adversarial relationship between McKim and Mies is long gone doesn't mean a thing. That conflict between old and new is gone.

Another related topic is what I would call a radical idea versus the image of a radical idea. Whether something is genuinely radical is so only if it hasn't been done, or is difficult to do, or the results are uncertain, which is different from reproducing years



later what the profession learned to do in former times. The struggle to implement and to understand new work, as a valued act of architectural conduct is very different from repeating a learned image.

Now we notice many buildings that are carrying forward the image of what's supposed to be radical, but it's now a learned response as opposed to a discovered response. And the question is whether the digital process facilitates this 'living up to an image'. An architect makes recognisable buildings. At an early certain point, one doesn't know how to do it; at another point, one does. At an originating point, it's a radical act; at a later point, it's actually conservative.

MS I think the challenge for me today in terms of representational tools and techniques is how to customise them. I want to make them more personal, make them more akin to the premise of my own work, less generic. It's not just the software. It's using a combination of a tool set in a very particular way to produce very particular

forms or very particular conditions that belong only to a single architect.

EOM So you think the new representational tools allow you more opportunities to customise a point of view?

MS If you use them the right way.

EOM What would be the right way?

MS The right way means your own way. The way we model surfaces in Maya and then translate them to Rhino is very different from many of our contemporaries.

EOM Do you have an example of a particular project?

MS For the SCI-Arc Pavilion, there's a contrast between two shapes that aren't typically found together — we are very interested in creating that sense of disjunction between one side, completely curved, and the Cartesian condition on

the other side. One is more hard edged and faces the parking lot; the other, softer side faces the street.

EOM And if someone were to come along in 50 years and look at that and look at the pavilion, knowing historically, if you think like X, you do X, if you think like Y, you do Y, but Marcelo came along and put X and Y together in an unorthodox combination.

MS Let's say that because the software now facilitates complex curves, which were once difficult to produce, the assumption now is everything is supposed to be curved. Same mindset once applied to boxes. Neither helps.

EOM And what, in the broad human perspective which representation delivers, what would be the conclusion about that combination of topics?

MS It means for me there is a certain engagement with conventions, that it contests the regulations, personalises the work.

EOM Well, if you look at the movement of architectural ideas over time, they don't necessarily get more radical or they don't necessarily progress in a line to a new design destination by undoing the previous idea. I'll give you an example. You go to Paris, the Eiffel Tower and the Sacré-Coeur, let's say: two examples that could be two opposing ways of discussing the meaning of buildings. The two were done at roughly the same time. One is somewhere between Roman and Byzantine. The other is more an act of progressive engineering. The new engineering design implies a revised perspective on everything else in the city, makes everything in the city different in contrast to the new tower, because, in a way, if the tower is right, everything else has to be re-examined, looked at differently. So there's also an essential stabilising Sacré-Coeur conservatism, across time. So re-radicalising content using the digital tools we're talking about could also be used in the service of very different ideas.

HDA I still believe in the idea of the radical project. Radicality has never relied completely on the means to deliver it. It also requires a relationship to society, to culture, at any given time. The notion of time is tricky. When I started working with computers in around '98, I completely embraced a radical change in the way I produced or thought about architecture. I was a pretty gifted drawer; I knew how to do that and I felt very comfortable about working that way. When I started with the computer, I decided to embrace it and completely abandoned any vestige of my previous life of representation.

EOM Do you draw anything any more?

6. Render of P-A-T-T-E-R-N-S' League of Shadows SCI-Arc graduation pavilion 7. Render of the Keelung Crystal Harbour Service Building, Taiwan, by P-A-T-T-E-R-N-S HDA I draw almost nothing.

EOM So with students, do you ever draw?

HDA Most of the time I grab the mouse and do something directly in the computer. It was a fundamentalist's decision let's say. You go to my desk in my office. There's nothing. Only my laptop. That's it. There's nothing else.

My way of working with the software was an embrace. The parametric software that I use is animation software. The parametric software in my office is not Rhino, it is Maya. We use Rhino to translate Maya into a construction format. I was very interested in the cinematic aspect of software, and we have been using the animation on the camera as a way to understand architecture, the way to articulate and produce a cinematic aspect. That's why I feel so comfortable working with the computer, not only because the tools were cool and allowed us to do other things which is in itself interesting, but it was because it really was a way to marry my original ambition to the new tools.

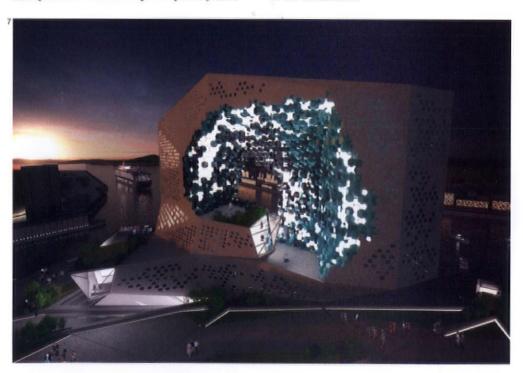
I realised that the work I was doing in school in Argentina – drawing by hand – and what I'm doing now, at the core, are still the same. I think as an architect you're always working on the same problem, but the techniques and the tools shape and change, and I think we establish a certain level of partnership with the new tools.

EOM We're talking about a kinetic tool. If you're looking at animation software, what moves, conventionally, are the people who are in it, or see it, or fly over it, or pass by it. But the building pieces are fixed. So to understand the spaces or relationships of spaces you're

arguing that a kinetic mechanism gives you something different from a static mechanism. But what does a kinetic mechanism allow you to understand about building?

HDA It's what I would call the fourth dimension. It's to understand space or an object as an entity on its own terms. So animation is not just a mechanism to represent the work; it's a way to generate and to think about the work in the same way that somebody else like Frank [Gehry] will work with models, or Thom [Mayne] will work with axonometrics, or you with all those sketches. It's a parts-whole relationship that one needs to establish. For me there is a level of distance that I need to establish from the work. The camera and the animation allow me to do that. Really, it's a pure act of object autonomy, almost like the object doesn't belong to me, which is not true. But there is something about that kind of schizophrenia - I own it; it owns itself - that's important.

EOM Let's say you're making something, and, in the course of making it, you adjust it. It evolves. It becomes something else. How do you use animation software as a way of thinking, to make judgements about form and space and material? That's a very unconventional way of thinking because you introduce movement. The CIAM guys always talked about movement as routes of circulation. You look at the drawings of Chandigarh - seven velocities, seven circulation forms. But that's not what you're discussing. The velocity theory - animation design - raises a number of questions: the rate of the animation, the perspective of the animation?



HDA What is the camera? What is the angle?

EOM What is the speed?

HDA That is part of the problem. The other one is how you start to work. I think also on ways to introduce limitations on problems. I'm not saying architecture is movie making. For instance, we're doing a centre for Boeing in Seattle, which is an interior scheme. I felt the process of designing the project was very similar to drawing by hand. It was done through animation and image agreement — understanding of the nature of the space and the form.

Now, when we're producing the documents in order to build it, we're using Rhino and CATIA, as many offices do. I would say that popular software and the related technology interests me the least because I see very little angle for corruption there. It becomes a very straightforward part of the project. So I'm not saying that I'm drawing. I was saying that when the team shows me a whole DD set and you look at it, you will make a mark; change this or change that. You don't go back to the computer because those already are fixed drawings. That's it for hand drawing. I would not consider CATIA and Rhino software tools for thinking. They're for production. AutoCAD is simply a more efficient way to draw by hand.

Even when I was working by hand in the office, I'd never be the guy who did freehand sketches. I always worked with triangles and compass. Everything is straight, very precisely drawn. Even what I would consider to be a sketch was an incredibly precise geometrical drawing. I never did a freehand sketch. I never trusted them. I've never been interested in that aspect. I've always been

obsessed with precision, and, for me, the computer was that on steroids, almost a detachment from the sense of the hand.

EOM So you could explain how the animation theory of conceptual development might differ or might give you a certain result with more conventional tools. This is a different idea.

HDA In my office we tried every new tool that came out. We rejected many of them because there is a certain essential conservatism that emanates from the computer world.

EOM I have a doctor like that. Every time somebody delivers him a new pill, he tries it.

HDA I always go back to Maya. So there is a certain — even in my own way of working — a certain established software premise in the way I work because I've become comfortable with it and I understand how to work with it.

EOM This is always interesting of course. However radical the work is ...

HDA ... There's always a conservative aspect ...

EOM ... Something you can turn your back on and not get stabbed; something you trust.

HDA In that sense it's no different from you with your guys and your team. In Maya, with my team, there are guys who are better than I am right now with Maya. They know all the scripting which I am not familiar with. So, even in that, I have a relationship to my team, similar to the one you have with yours. You do it through a series of sketches, they go back to Maya, then translate it into a more sophisticated software. So that similarity in

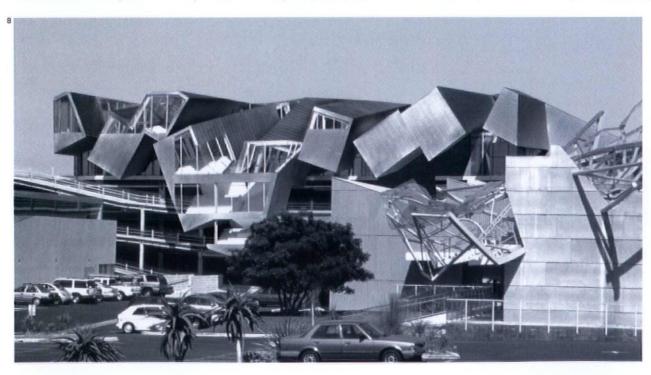
use of software, regardless of different points of view, never goes away. Something essential to all our processes. I agree with Marcelo—we have to have a very clear conceptual apparatus, a chronology of software applications, while you're trying to produce architecture today.

MS One, let's not get too dogmatic with respect to tools because that actually freezes the work. But there has to be an inner coherence, which is where work differs. I wouldn't want to say signature. How about ...

HDA Value?

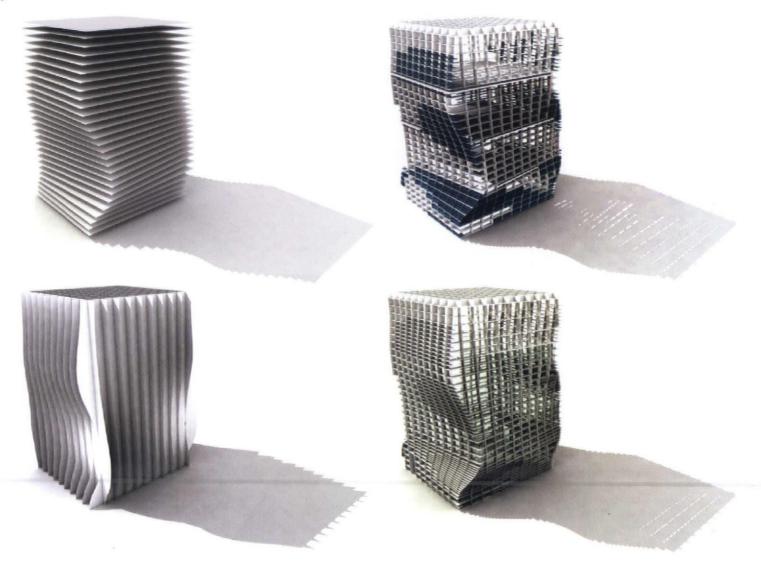
MS Trajectory? Value? The way I used to sketch when I was at school was very different. I would tend to sketch certain objects in plane and others in perspective; you know, try to study things in sketching. We had just finished a competition for a mosque and were starting the pairing and facade using Maya. Then after that, there's already probably a script in Rhino and Grasshopper that produces what's needed mathematically because I believe that however subjective and random is the solution, there is a drawn, mathematical solution. I'm thinking all the way to a final object whether it gets built or not.

EOM But what you're saying is a free form has an underlying technical requirement for implementation. Even the most complicated fractal shape can be reduced to a mathematical conception. The freest, most intuitive shape, to be constructed requires an antithetical spirit. Enormous rigour. The computer might or might not give you the first; but it certainly guarantees the



8. Eric Owen Moss, Pterodactyl office building and garage, Culver City, California 9. Eric Owen Moss, waffle skin renders





second. That's why the odd instinct is built more often now. The computer rationalises the instinct, makes it technically plausible.

HDA For sure.

EOM You used the word 'corruption', but you never explained why corruption is an aspiration or a virtue. What is corruption? In the first instance a software designer designed the software anticipating it would be used to solve certain problems in a certain way.

HDA Exactly. It's a system. It's a method. And I would argue that anybody who produces a work of interest with software, as a by-product, has to find different mechanisms to corrupt that methodical linearity that underlies the software design. Corrupting means finding possibilities to create an accident, possibilities to contradict; to prove anomalies within the frame of reference of that tool's use is actually possible. I can argue that the corruption tendency you can see clearly in the last five or six years, was much

more difficult to discover in the first 15 years of this process. Everything's a circle and the opposites almost touch. Now, we have tools and techniques that are mathematically perfect. You draw a curve there, it's perfect, mathematically, and naturally, there is a desire to find agents to produce the opposite, to introduce imperfection.

EOM The first step was the advent of software that allowed you to conceive in a precise way, what was very difficult to represent before the software. But now the software is available, the goal is not to deliver what the software initially allowed, rather to find a way to contradict its original intention.

HDA Yes. The ultimate goal of the software is to enhance the humanism of architecture.

EOM What do you mean by that?

HDA You have more conceptual options, more and different ways to represent the world. If you're not willing to explore that, if you're not

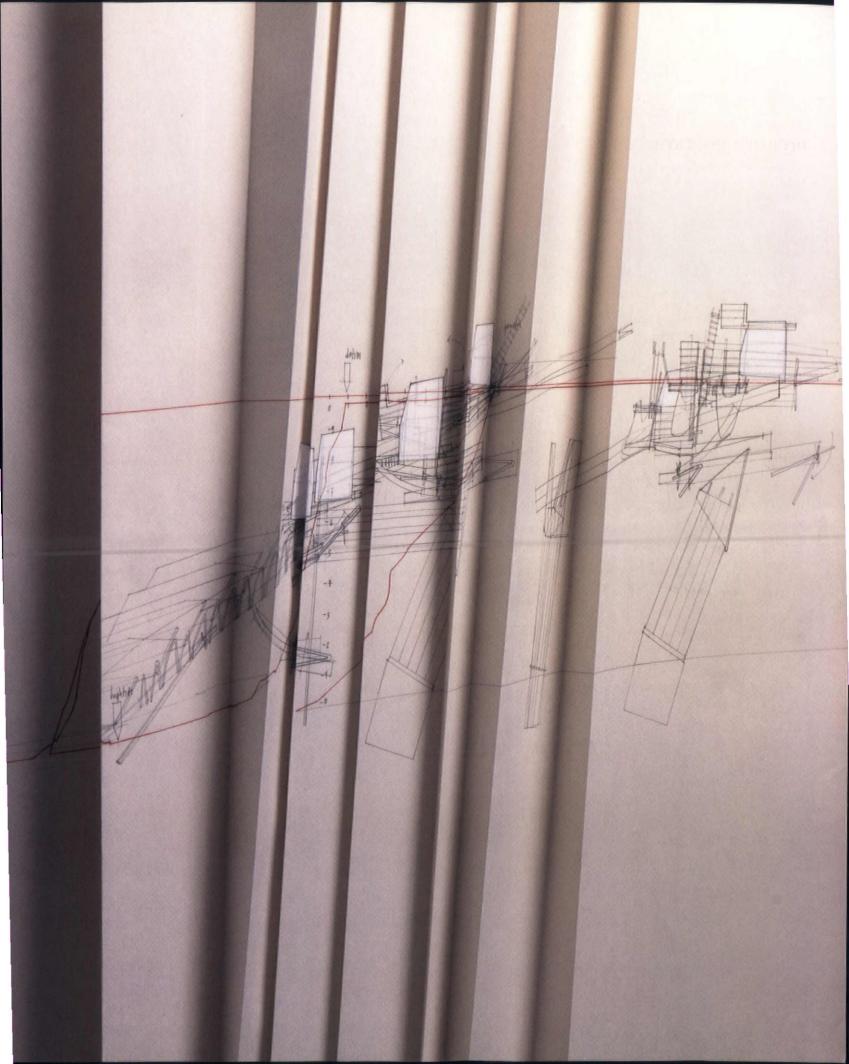
willing to challenge the known form language, you're simply serving the purpose of the original invention.

MS I think that's actually important that we look for materials or assembly conditions that have nothing to do with the software. Departures from the original menus create a striation, what I will call a certain authenticity in the work, which I might call corruption. I like that word less, but I think there is certain alignment in terms of the continuing goal to produce new work.

HDA Somebody should write a book about which software succeeded and which failed. Remember the middle to the end of the '90s, formZ was super powerful and then it disappeared. Why? It was based on fractals and was abandoned and replaced by something else. Perhaps not enough time has passed to draw conclusions on what worked — or was corruptible — and what didn't.

EOM The failure of the incorruptible.

Exploring the hidden meanings of landscapes by holding 'a seance for a place', Mark Smout and Laura Allen's architectural speculations create a poetic ambiguity that subverts the conventions of drawing and modelling. Interview by *Peter Cook* and *Will Hunter*



Mark Smout and Laura Allen are senior lecturers at the Bartlett School of Architecture. where they run a diploma studio which frequently collaborates with BLDGBLOG's Geoff Manaugh. The pair both studied and taught at the school while it was under the directorship of Peter Cook, who ushered in a new era at the Bartlett between 1990 and 2006. In many ways this continued the architectural speculation that Archigram - of which Cook was a founder member - popularised in the 1960s, Alongside Smout Allen, the culture of the school developed with units led by Nat Chard (who emigrated to Canada) and CJ Lim(still in residence), among many others. AR Deputy Editor Will Hunter also studied at the Bartlett while Peter Cook was head.

Peter Cook Let's start by talking about the manoeuvre in drawing. In some architectural cultures I think it isn't fully understood. People think in certain Classical, Minimalist, and even some digital approaches there is an inevitable consequence in everything. Whereas with the manoeuvre you intervene to articulate — but also deliberately to pervert — the inevitable.

Laura Allen The making of the representation is important to us. Since we never really get a building from what we do, a lot of the process and ideas are simply embedded in just a couple of drawings. They're not to build anything from; they're there to help us imagine all these environments and all of the life that this thing has. And maybe all of those little manoeuvres are where you lay a seed for later on — for further development of those ideas as and when.

'I think the influence of the writers in architectural education has been disastrous. It's been overblown and there's nothing much that any of us can do about it, because they know how to manipulate the academic system'

Mark Smout That's partly the function of working in an education environment. The majority of our initial work is still hand drawn creating a large 'incubation' phase to any project. It's kind of floating around with a few manoeuvres and ideas, before you actually have to be incredibly precise. In every problem there is a potential rather than a particular solution, and that's the way we teach and talk about projects.

PC The key thing about the drawing is it doesn't have to be literal. You can draw something, and say that it has a certain atmosphere; that it might do something; or you might come upon it in an odd way; or a variety of types of materiality. Whereas the working drawing is showing: 'This is what it is'; 'That is what it is made of' — end of conversation. With what you two do there isn't an 'end of conversation' — it's probably only the beginning of a conversation. And it raises the issue of what is the 'moment of creativity'?

LA A lot of students ask us about how we 'do' a drawing — which really surprises me, because the drawings don't have a particular viewpoint, aren't really measured, they're not complex constructions but then they're not necessarily 'sketches' either. They can't imagine where the starting point of the drawing is. They're curious about how I didn't plan it but just did it; but drawing is also a thinking process, we let it happen and there's a point where that drawing's run its course and we might move on to another one.

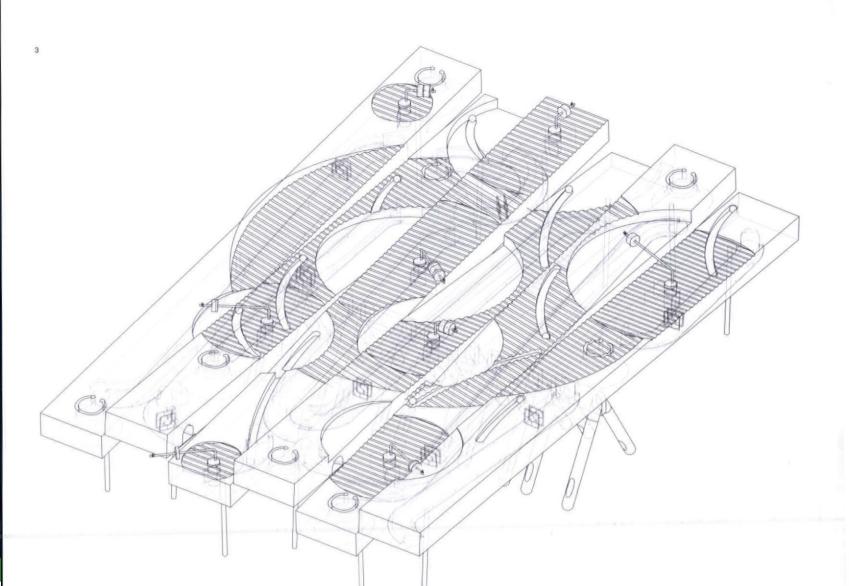
It's quite strange to me how many students nowadays don't necessarily design with drawings to help push ideas forward, but instead use them to represent an idea they already had. Although we don't teach drawing in any way, we do often make students stop talking about something and start drawing it. And obviously we then talk about how the drawing might help them to think about it and help them to describe it.

Will Hunter What has caused this shift in the students? Has there been a change in culture? Does it relate to the computer?

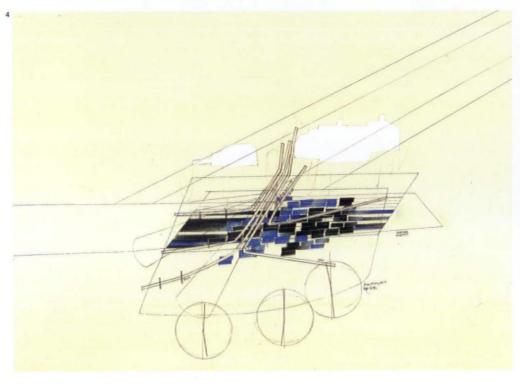
LA I think they don't have an attitude towards experimenting with representation and visualisation during the design process. They arrive and they want to head quickly towards something finished, and to make designs that immediately look like buildings. I think the computer has changed the design process. We see lots of sections and plans in degree school that are simply cut from Rhino models and they're nonsense - it's a totally different outcome to designing and drawing in section. They can quite quickly make something that looks viable with the computer now. That's quite tricky for tutors because we can't see their design process, we can't access their thought process, and it's hard to convince students that this thing that looks like a building, isn't there yet. It's very difficult to unpick something.

WH But isn't there perhaps a change in the methodologies about how to design. From OMA and the diagram, to early Foreign Office and data. Maybe sometimes students feel that all the complexities of a project can be resolved in a really clever diagram, or that





I. (Previous page) Laura
Allen's drawing for the
Retreating Village project,
inspired by the erosion of
Happisburgh, a cliff-top
Norfolk village that is
falling into the sea
2 & 3. Their installation
Lunar Wood has a
counterbalanced surface
that moves in a wave,
its equilibrium disturbed
by jets of air from below.
A short film of the
installation is included
on the web version of this
article at architecturalreview.com



4. A drawing for the Retreating Village project. Like many of their projects, the starting point was an ecological process: in this case, erosion 5. (Opposite, inside leaf) elevational view from the cliff edge for Retreating Village project 6. (Opposite, outside leaf) Wet Lands plan. The natural catchment of the flood plain is embedded with cisterns that permeate housing and porous landscaping. Atmospheric effects such as rainbows and mirages emerge from the activated and responsive skin of the building that soaks up and reactivates water

they need lots of research to validate their position — do you get a sense that students feel they can't start speculating about space without these things?

MS Yes I agree. The diagram and the role of data in contemporary architectural education is very interesting but they are ingredients rather than a recipe. What's unhelpful though is that research can often mean hours on Wikipedia. Students can get into a position where they feel that every next move needs justification or rationale and that shouldn't be the case. Ideas can't always easily be compressed or concentrated into diagrammatic form. And it takes skill to paraphrase architectural ideas and make a really clever diagram.

PC Talking about how the work is presented, I think it's very useful for people like you and me to do as many lectures as we can. It's a very good discipline forcing you to say what you think it's about, and sometimes to deliberately different audiences: a local audience; a high pollutant audience; an audience that won't remotely know where it comes from; another audience that has seen everybody, heard everything. When you have to re-articulate it, sometimes your views can change.

WH Does the story of the project change with the retelling? How far do you try to make the project's representation — its models and drawing — contain the whole story?

LA The Thames Gateway project can be presented in lots of different ways depending on who the audience is. When we presented it to science and urbanism students, we spoke about it in relation to the serious issues of London's water resources. The existing relationship is that water is controlled by infrastructure and hidden from the city; and we talked about creating a new relationship so that it becomes part of a visible and shared ecology with the city instead. They were very interested in that. But they didn't really get excited about the detail of the architectural proposition like we do. They couldn't read the drawings and they're not familiar with the architectural language we commonly use to describe the work; they couldn't understand what we meant by 'porous housing'.

Other audiences need a different visual and descriptive language. There's always a danger of being too esoteric. That's fine, we're just as excited about the ideas as we are about the drawings at this stage and we need to work on how to communicate work like this to a broader community. And at the moment the drawings are more about capturing the ideas for us. I don't try to make them contain the whole story — not in relation to communicating to other people. But in the process of drawing it, it potentially does.

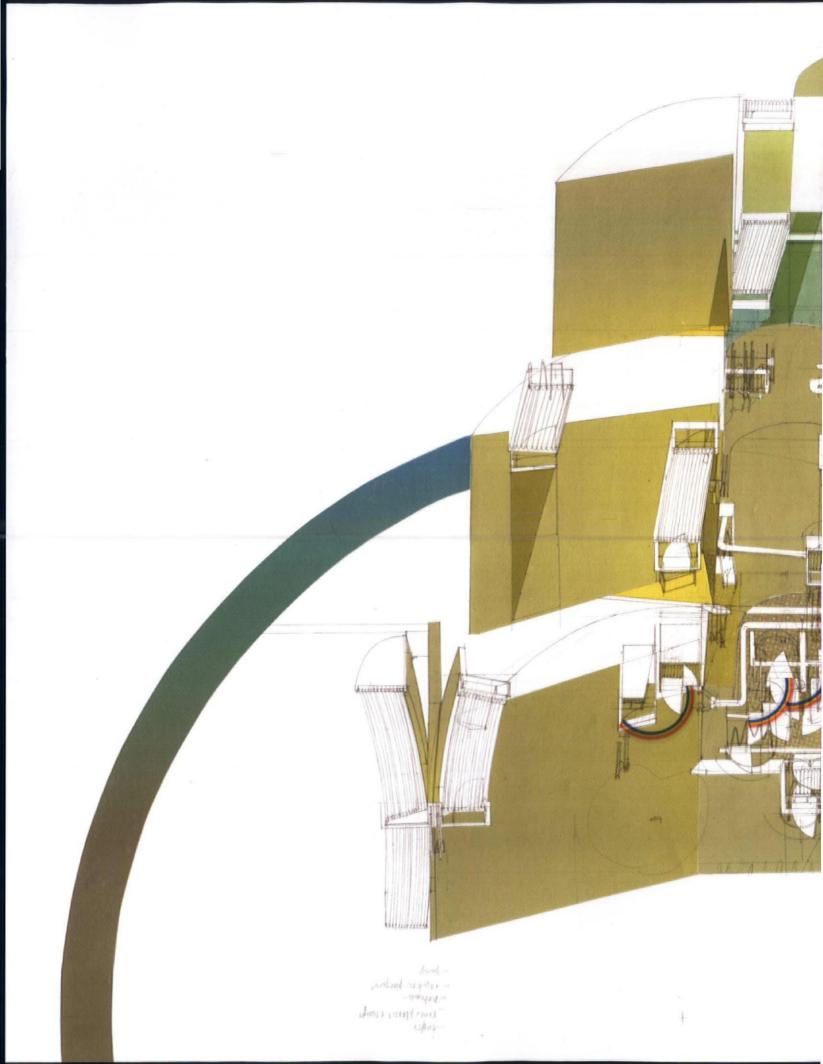
PC There are some schools that really create a culture. Where there's a great awareness of what's going on in the whole school. SCI-Arc is one, the Bartlett is definitely one — and still one — but I struggle to think of the next two or three. And this brings me on to a related point: to what extent you expose yourselves to external criticism, meaning not just critics that you hang around with? What happens if you get somebody like Nat Chard?

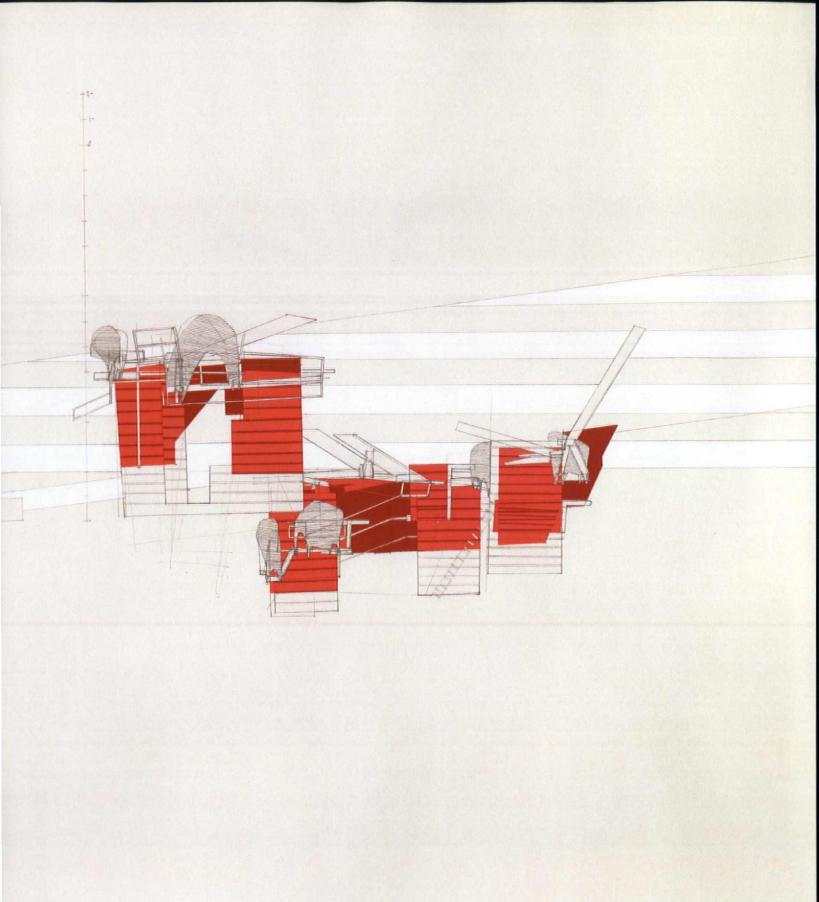
MS We did a teaching event with Nat Chard, Geoff Manaugh and all our collective students that went on until two in the morning in a beach house in Florida. It was really interesting to see the correlations that exist between us and those that differ. Nat has a very particular ideology on materials, say, and a different context that he draws from, and Geoff is a sci-fl and technology nut with an encyclopaedic mind, there are some common threads and some points of disagreement as well. It was a fantastic experience.

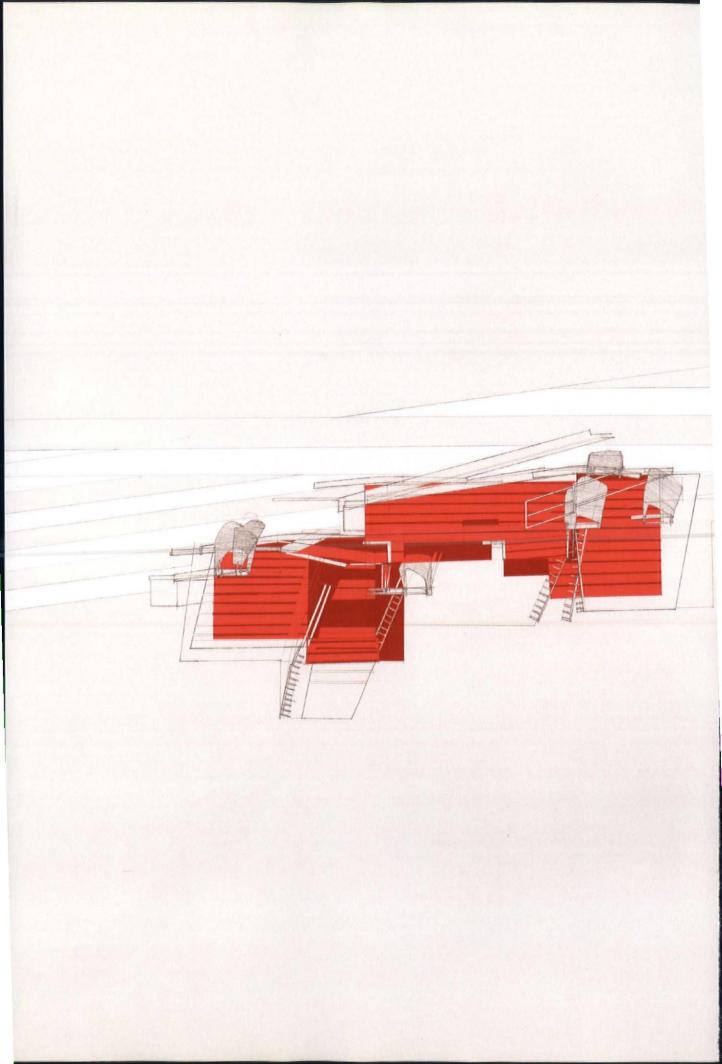
PC Well it's like in the States. Actually Thom Mayne and Steven Holl are very good friends. The work is definably different from both brilliant guys and they know that they are sort-of allies — given the rest of the scenery — the same way as old lovers who aren't together any more. Ito and Hasegawa in Tokyo are similar. When I was doing this thing in Ito's school the other day, there was a little circuit of people who were obviously kind of allies, who know their individual work may be different but compared with the rest of people are in a sort of pocket.

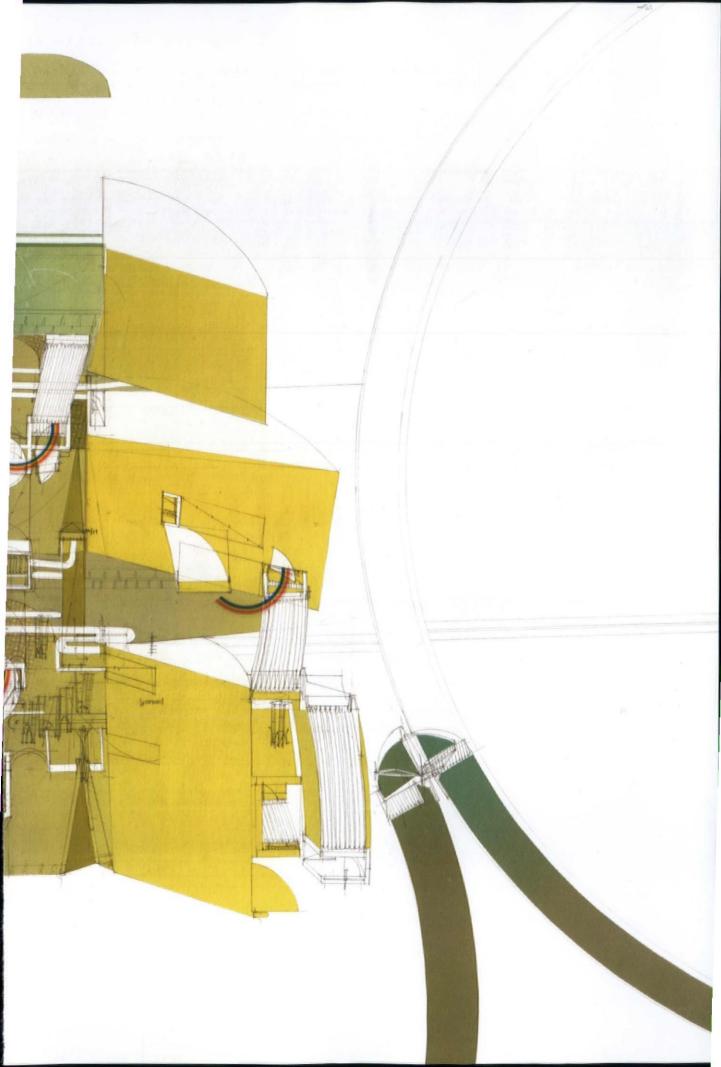
LA Sometimes it can feel that from the outside we all get put into one big Bartlett pocket. But the thing is we know what CJ Lim is doing, but we hardly ever see it until he has already done it. We don't have joint crits, we don't really have conversations about our work, but we do about our teaching. I think it's because time is precious and you have a little idea and you've got to get it out rather than share it. We probably share more via our students. His students are very 'him', and our students are very 'us', and they cross-fertilise.

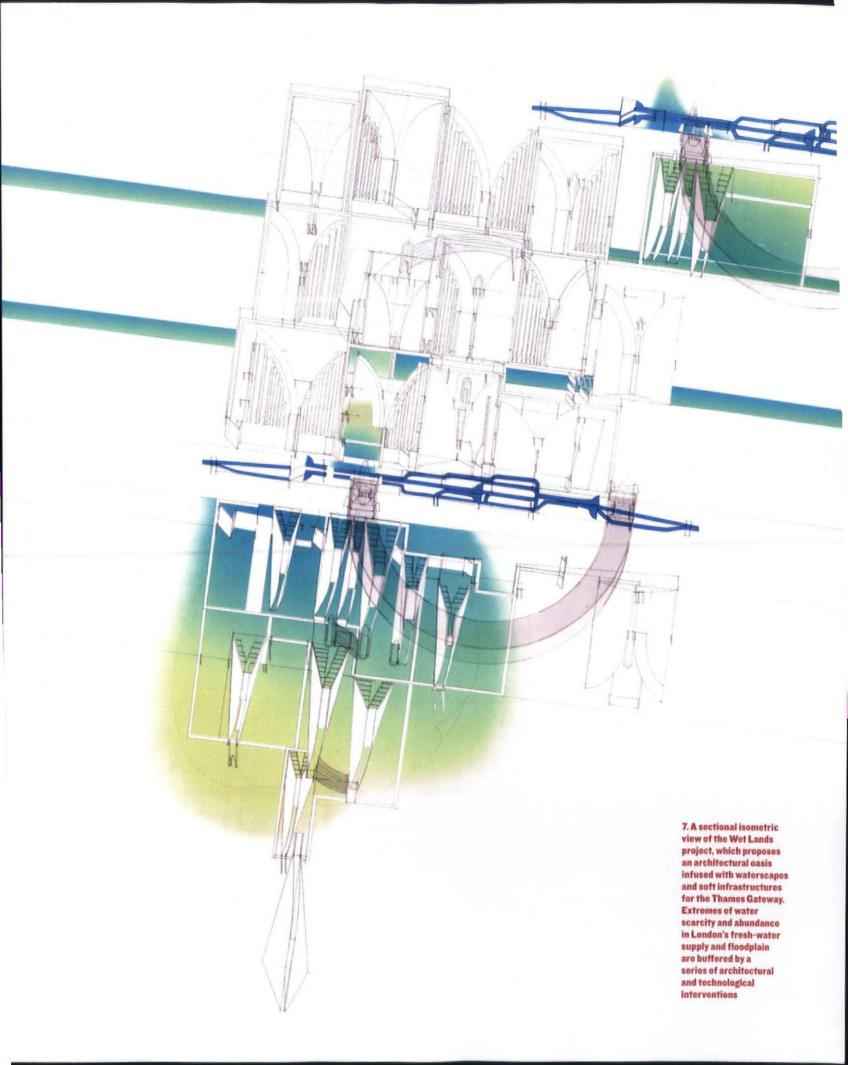
WH But if you were to explain what it is you do to someone outside the Bartlett pocket,

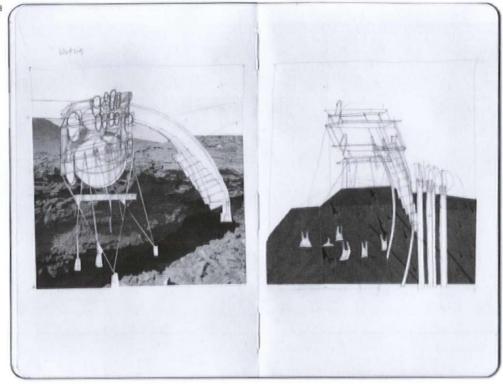












8. Sketchbook for the Lanzarote Envirographic Architecture project. Photographs of the lunar-like surface of the island are montaged with drawings 9. (Opposite) the aim was to generate energy for Lanzarote using hydrological processes: like the Thames Gateway project, it is a response to climate change and its effects on water in the landscape

how would you? To someone who has no comprehension of the culture of the place and its terms – how do you define and put into words the ideas that drive your work?

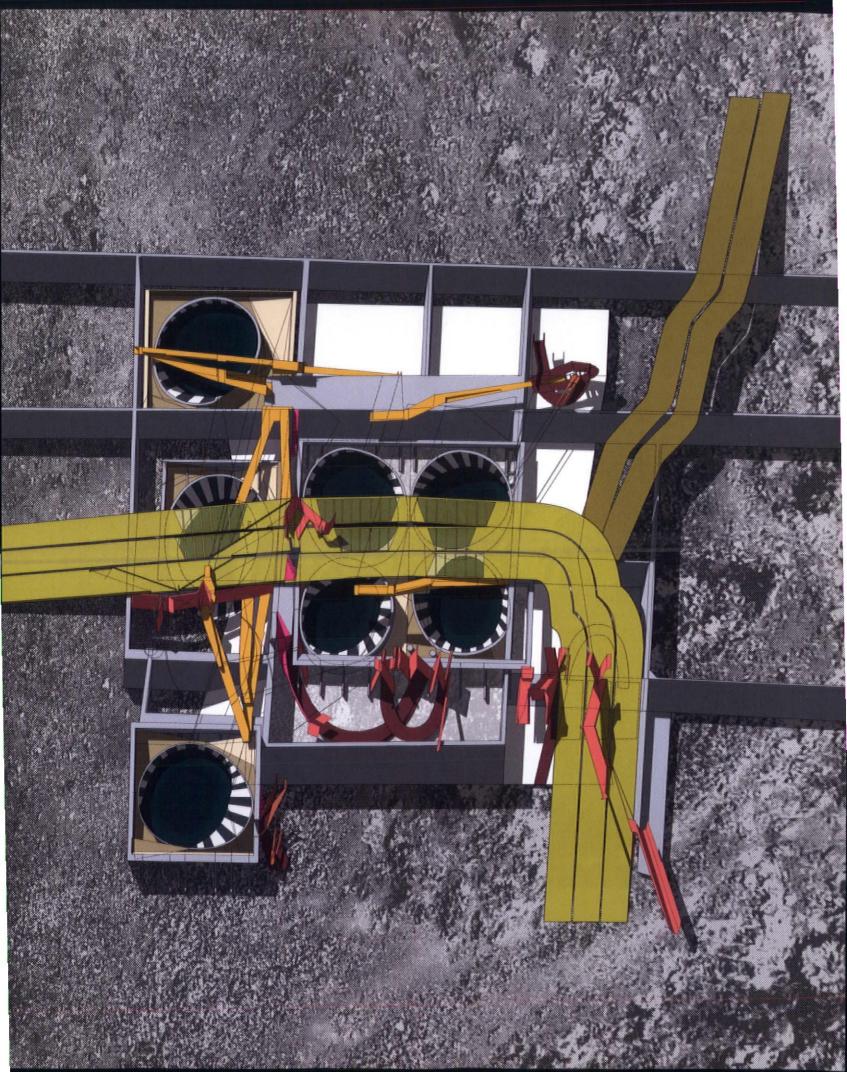
- MS At its simplest it is driven by landscape. It's not that we're landscape designers, designing parks, paths and things. But we're interested in making a reading of landscape, of the things that aren't necessarily obvious at first glance, that are hidden in time, or from human sight. We look for deeper meanings and understandings, which might be to do with its history or its ecology. It's almost like holding a seance about a place. We look for uniqueness in a context. And this narrative goes towards making a project and informs architectural ideas which we then like to think about in drawings and models.
- LA I've recently been trying to think about drawing in relation to writing, because most of the people at work encouraging us to talk more about our projects are writers. It's really difficult, especially as I don't enjoy writing. It's very hard to find techniques in drawing that I can relate to the process of writing. You don't start a drawing in the top left corner and finish in the bottom right; you rework ideas and the old and new stuff might all be there. Even if the composition is very defined, it can still be re-read differently each time and some ideas in a drawing, even if it looks well structured so to speak, are just an initial gesture.
- **PC** I think you're in an era of academe that is very different from my period. It didn't matter if you had the theoretical position. It was assumed you did, and you could do whatever

work you liked without the pressure to publish. The fact that I've published several books is a 'by the way' clause. Personally I can write very easily, more like a journalist, quickly about what interests me. But I'm not good at research writing.

Now it seems that the pressure's on that. I think the influence of the writers in architectural education has been disastrous. It's been overblown and there's nothing much that any of us can do about it, because they know how to manipulate the academic system.

- LA But it's interesting to talk to the writers because they're unlike the designers in the school. They want to talk about design work, perhaps because they're not competing with us. It's a competitive place.
- PC Well if you don't do what you do, they're out of a job, if you think about it. Theorists and writers can only theorise, although they do very well theorising about nothing and in historical depth too. Where would Ruskin be without the Gothic Revival? I don't know. But some geezer's had to do this stuff and they could pontificate about it. I think that another 10-15 years of dominance of theorists in architecture schools will be terrible. And as history will show, they held back architecture, I'm sure of that.
- WH But surely it will be the writers who write that history? I think they or 'we' I suppose as I am among them have a role in teasing out meaning and making connections between things that sometimes aren't immediately obvious when you are making the architectural project.

- LA The writers don't dominate at the Bartlett but they're definitely a well-organised group. They meet together for a lunch and have a talk, whereas with us we're all beavering away in our offices. But the writers ask us to explain things in some kind of detail, or with a linear process or to discuss an argument that maybe wasn't there when we put the work together. They ask difficult questions and turn the projects on their heads. The problem is if you put something out there, it's going to be interpreted and then perhaps misinterpreted. And that's fine!
- WH Actually, one of your biggest collaborators is Geoff Manaugh, who I would classify more as a writer, I don't know if he designs too? What do you offer each other?
- MS He doesn't design but he does teach design and runs a studio at Columbia. I think we're both interested in speculative ideas about land use and about technologies and the future relationship between man and the environment. We also share an interest in uncovering undisclosed, forgotten or emerging stories about the city. We share a sort of 'what if' kind of curiosity about what that might be ... and a love of crazy golf.
- with your work: I don't see a distinction between the drawings and models. And there's a tremendous precedent for that in Constructivist art, with Schwitters and El Lissitzky. There would always be the drawing wanting to be the model, the model turning into a drawing exploring the manoeuvre, space and presence of the object.





MS We move freely between drawings and 3D, and both sometimes exhibit the characteristics of the other. It's a fluid way of working and I think you have to be very comfortable moving forward without quite knowing everything. I use my sketchbook as a sort of vague memoir for ideas. I don't work things out necessarily in there, but it's also useful because I take it into the workshop with me while I wouldn't take some of the drawings perhaps. Generally when we're down at the workshop we work very furiously, so there is the love of the craft, but we're also trying to create things quickly.

What was really interesting was when we were doing the Lunar Wood model, the CNC router – I think the company went bust as soon as it had made that one, so the software didn't quite work – kept plunging and cutting these great big grooves out of what was a rather delicate drawing. So you had to go to a different bit of the workshop, find a different craftsman to insert new bits of wood into the mistakes. There are some great mistakes in there – patches and fillets.

- PC The other thing that interests me is the collage, not necessarily literally, but the way of thinking to produce a hybrid which maybe hasn't appeared before. Like if I take your Norfolk project where time and memory of the place is the key factor, and the drawing is to do with the 'syndrome'. And it's showing what perhaps is necessary to sustain the basic idea?
- LA The Retreating Village was designed very much like a kit of parts, it had to have a kind of 'make do' aesthetic and borrowed from farm machinery, caravans and fishing paraphernalia which I worked together. Some of the drawings were collages but I was collaging
- 'In the main we do ideas projects, so we can be indulgent or poetic with drawings and models in a way that production drawings can't be'

time or trajectories into the landscape rather than architectural elements to try to evoke the potential dynamism of the site.

- Museum project in Egypt. And that was the daft thing because I would say it was probably more than you needed to do. And perhaps you've learned from that 'craft fetishism'. That's an interesting thing with the drawing, if you're a good drawer you can avoid it. Once you've got the thing down on paper that's enough for that stage and you move forward. The trouble with the physical object is it gets into the fine-tuning, which takes a long time in relation to the idea. So in some cases I think it's good to have a fast project.
- LA I do too. It's funny, Peter, that whenever you talk about drawing you point to your head, and every time you talk about models you make the shape of the model in the air. That's weird isn't it that the drawing even when its completed remains a mental thing but the model doesn't, it's no longer in the period of the incubation?
- **PC** I think in any project, there's a sort of light bulb in the sky period, then the development period, and then a period when you have to balance them out. I always leave something easy to do for the evening, and have gone to sleep many times over a certain problem. Then sometimes I can sit looking at a drawing, which isn't remotely finished, and get an idea about it.
- MS That's the beauty of the sketchbook though isn't it? You can go through old ones occasionally and find hundreds of ideas and

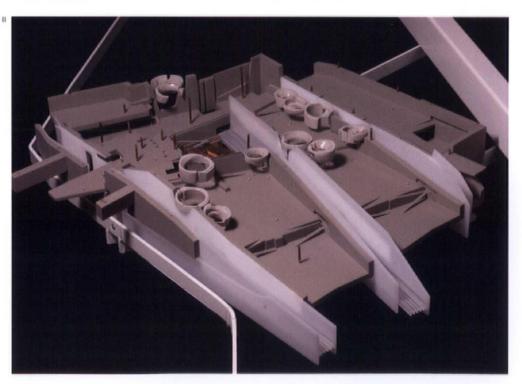
half-started things that got overlooked or designed out, that you really should revisit at some point.

WH You've spoken quite a lot about the ideas point, but I wonder if and how you get a sense of closure with projects? Do you get a feeling it is done and you can move on? For conventional architectural projects it is the building of the thing. And that brings me to my other question about the role of production drawings adding a constraint to a project, which in a way is the ultimate test of an idea, whether it survives or not. In your work, what is that ultimate test?

LA I suppose with our projects, which in the main are conceptual research or ideas projects, we can be indulgent or poetic with our drawings and models in a way that production drawings can't be. We don't necessarily need to be disciplined in the conventional sense and that can be liberating of course.

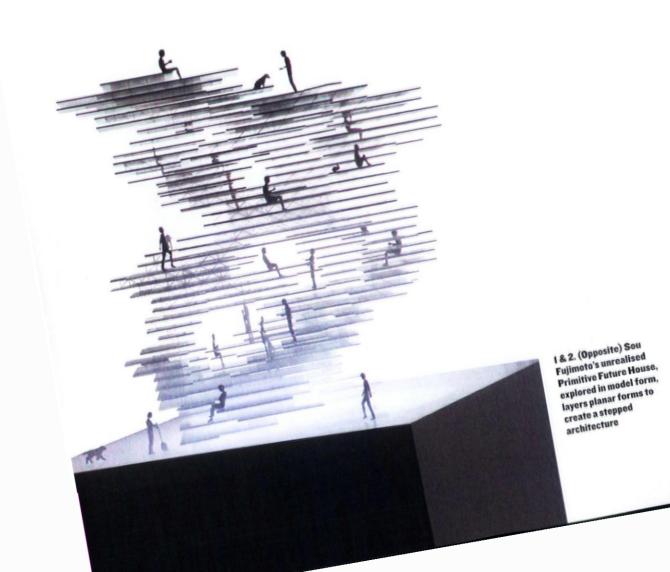
At the moment, we often test out the ideas by also considering them in model form, we make models that are interactive, that is to say that you can manipulate them, often they incorporate some kind of dynamic element so they are playful or can be played with. This is about allowing other people to have a greater level of connection with a project and to be able to interrogate it in some way that might be more accessible than the drawings we do.

Of course, it would be wonderful to build some of the projects we've designed and to have the opportunity to revisit them with all the constraints and compromises that would entail.

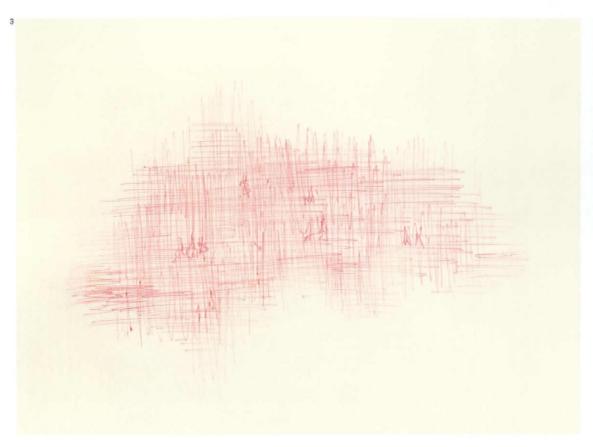


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Japanese architect Sou Fujimoto talks to
Japanese architect Sou Fujimoto talks to
Hans Ulrich Obrist and Julia Peyton-Jones
about the centrality of sketching and
modelling to his architecture







3. A sketch for the 2013
Serpentine Pavilion
shows architectural
form emerging from the
process of mark-making
4. A render of the pavilion
demonstrating the
structure's intangibility.
The grid dissolves into
the sky, materialising
Fujimoto's ideas about
nature and artifice

Sou Fujimoto founded his Tokyo-based practice in 2000. He has created several notable projects, such as the Final Wooden House, the NA House, and Musashino Art University Museum & Library (completed in 2010). He was awarded AR's Emerging Architecture prize three times in a row (2005-7), a winning streak only curtailed by joining the judging panel in 2008. As the designer of this year's Serpentine Pavilion, we asked the two co-directors of the gallery, Julia Peyton-Jones and Hans Ulrich Obrist, to quiz the Japanese architect about how he expresses his ideas visually

Julia Peyton-Jones How important was the process of drawing for you at the start of your career?

Sou Fujimoto For me, drawing is an endless process of trial-and-error to give form to the vague architectural inspirations that fill my brain. You could say that drawing is like having a dialogue with oneself. Earlier in my career, when I thought that there was no outlet, I still believed that the ideas behind my drawings would lead to something in the future, so I continued with my

exploration. Some of them did become the basis for work later on in my career, but I didn't know that at the time, of course. And I carried on sketching regardless.

JPJ Do you have a preferred way of working? How do you see the relationship between drawings and models in your practice?

SF I prefer to use simple means, such as words, sketches, models and discussions with my team, when I proceed with a new project. I may see a way forward when I'm sketching or it may be when we are making lots of highly conceptual models that I begin to see a solution. New possibilities may emerge when I'm having discussions with my staff. Whatever the method I may employ, it is essential that I try to externalise what is inside me during these creative moments. Sketches, models, words and discussions - we become aware of their true meanings or possibilities only when ideas are fully externalised.

Hans Ulrich Obrist Some architects begin with a sketch and work it up from there. But you have said that what matters to you is the process, the small parts of architecture, the various activities that take place before the actual building starts taking shape. Could you talk a little about the way you develop your ideas?

SF When I draw or make models, the goal is not to try to arrive at definitive architectural forms. On the contrary, I try to understand architecture through the movements or activities of people or the spirit of places that is likely to inspire their movements or activities.

Ambiguity, moreover, begets fluidity, which in turn begets manifold interpretations, as well as organic ideas inspired by the surrounding environment. It is for this reason that my sketches are mostly made up of loose lines. Drawing, you could say, is a process of waiting for architecture to slowly emerge out of these nebulous shapes that precedes definitive shapes, or out of looser or freer orders that precedes definitive orders, teasing out and nurturing architecture.

JPJ Is the transition from drawings to three-dimensional

models a smooth one for you? Do your plans change when moving back and forth from paper to models?

SF Drawing and making models progress side by side. Transforming vague models, born out of sketches and words, into something more substantial, such as three-dimensional models, is always very exciting. This is because things never progress the way we expect them to. As something else emerges, we finally understand that we do have the breadth and depth necessary to complete a project. The toing-and-froing between pure concepts or sketches and more tangible forms of architecture eventually lays down a foundation for the most powerful architecture.

HUO You have spoken about seeking to create an interaction or blurring between interior and exterior in your architecture. How do these ideas figure in your drawings?

SF My sketches are full of blurry, hazy, random shapes. I see them as prototypes of places and spaces. Ideas become very



'Two archetypal scenes define the heart of my architecture – one is the natural order of my hometown, and the other is the artificial world of Tokyo' important when I try to transform these archetypal images into three-dimensional models or architectural forms. As an architect, I must invent new ways of making architecture and new ways of making spaces as tangible ideas. I use sketches, models, words and discussions — whatever method available at hand — to find what that may be.

JPJ Your corpus of work involves a recurrent use of the grid and the Serpentine Gallery Pavilion is an excellent example of this. Why do you choose to work with the grid and why is it such an important element in your work?

SF The grid is the most primitive form of order, as well as being the most transparent. To rediscover and reinvent the grid architecturally is the big challenge. If you can incorporate ambiguity and fluidity into the grid that is primitive and authentic, then that's very exciting. We might say that this is the moment when nature meets the artificial world. I want to find new orders that surpass the primitive order. I think that's why the grid always shows up in my buildings.

HUO You were born in the countryside and moved to Tokyo. Has your drawing been influenced by this transition as much as your thinking about architecture? What is the relationship between geometric and natural forms in your designs?

SF You will find two archetypal scenes that define what is at the heart of my architecture — one is the natural order, which reflects the forest and nature of my hometown, and the other is the artificial world, which reflects the complexity and richness of the city of Tokyo.

The two orders are contradictory but they are inexplicably fused in my mind. Likewise, I want to create a place for people, which is poised between nature and the artificial world. The future for me is where these natural and artificial geometries come together.

I want to find the fertile meeting ground for their complexity as well as their simplicity. I feel that this is the premonition of our future that today's world is up against; they also reflect my own archetypal scenes. **HUO** Do you have an unrealised project or Utopian dream that you would like to realise one day?

SF You could say my Primitive Future House is Utopian because it can never be fully realised. Although its essence has manifested itself in architecture as many different forms, its complexity is profound precisely because it has not been realised.

If you have an important conceptual project, it might be just as exciting to seek out the endless possibilities within it, rather than try to build it. At the same time, if we are ever given the chance to realise such a project, we can create architecture that will exceed our imagination.

Finally, however wildly imaginative a project may be, it is important to believe that one day it will be built — such a conviction can become a powerful source of energy for great architecture. Even if it is never realised, we must not fall victim to pessimism but continue to believe that our imaginative endeavours will bear fruit in one form or another someday in the future.

Translated by Yuki Sumner



THE WAY TO CONFRONT THE COMPLEXITY OF THINGS IS TO RESOLVE IT SIMPLY

The monochromatic imagery of Spanish practice Barozzi Veiga describes an architecture powerful with meaning, finds *David Cohn*

I. In recent competitions
Barozzi Veiga has started
to work only in black
and white, to better
express the spatial and
material qualities of a
scheme, such as this
competition entry for
the Neanderthal Museum
in the northern Spanish
province of Asturias

Fabrizio Barozzi and Alberto Veiga met when both were working in the Seville studio of architect Guillermo Vázquez Consuegra, Barozzi had arrived in Seville from Italy with an Erasmus scholarship, Veiga is a native of Galicia, Spain, and came to Seville from Pamplona, where he studied architecture. After winning a competition for a housing project (unrealised), the two opened their own office in Barcelona in 2004, focusing on competitions for public buildings. They have completed several projects, mostly in Spain, and were finalists last year in the competition for the Strand Quadrangle of King's College in London.

David Cohn Your drawings and renderings are interesting in the way that they represent the architectural idea. Though you often use photomontage, some of them almost have the quality of engravings. It makes me think of Boullée.

Alberto Veiga We've gradually refined our drawings. We try to strip them down as much as possible, and to find our own language. In more recent competitions, we often simply work in black and white, for greater clarity and expressivity, and to emphasise the importance of the spaces. We bring renderings into the design process very early, trying to imagine the materials, colours and light. We do them ourselves. That's the phase of the project that we enjoy most, when you have the greatest freedom. It takes us at least three months to do a competition, which gives you time for reflection.

DC How did that working method inform your approach to the recent King's College London quadrangle competition?

AV Their brief called for a remodelling of the open space between the Strand and the river. It's a terribly fractured and



chaotic space, very Charles
Dickens, without clear
organisation. We always start
a project with the public spaces,
and organise the design
accordingly. At King's College,
the campus needed a clear, potent
and recognisable space that could
organise its three buildings.

We designed a plaza around a sort of monolith. It's simply an entry with an escalator going down to the new hall. It's small but rather powerful in attitude, to make it clear that the buildings are part of a whole. We didn't want to create an icon, or impose anything on the existing image of the College. What was needed was simply an element of reference.

DC You say the existing site conditions are very complex – but the way you show your project is very simple.

AV Fabrizio and I try to synthesise all the problems that come up in the design process and condense them to their very essence. But we're not minimalists. Often we are quite expressive in formal terms. But we try to be very clear about the ideas we wish to materialise.

The best way to confront the complexity of things is often not to respond with more complexity, but rather by trying to resolve them simply.

DC The impulse to carve things out appears in many of your projects. It's like you're sculpting a homogeneous mass. The monumentality and gestural qualities of the result are almost guaranteed.

AV We really aren't trying to create iconic buildings. It's true that we often work in monomaterials, to underline the

importance of this threedimensional aspect of spaces, to make them clear and simple, and to work with the light in a very clear way.

DC In your designs for sites with a more sombre, northern climate, such as the Neanderthal Museum in Asturias, you use the same sculptural process, but with different results, responding to the place and its ambience.

AV In the Neanderthal Museum competition, we were able to develop this idea of condensing a concept to its essence, of



2 & 3. Barozzi Veiga's proposal for the King's College quadrangle stood out from the other competition entries by taking by far the simplest formal approach. The practice reconciled the very complex site conditions with a vast and imposing subterranean volume and a virtually empty public space

becoming less exuberant. We wanted to transmit the idea of a primary form in the landscape. We imagined that it would at least provoke the curiosity of anyone approaching it.

DC Your projects are often about public architecture, and the idea of working for a specific community, in a particular place. How does the conversation around 'representation' fit into that?

AV Representation is a problematic word these days, because everyone associates it

with a certain kind of iconic architecture. We don't avoid this discourse. Public architecture often has to be representational. This role allows you to organise a place, to create a reference point, something people can identify as part of their city. And such works must often be imposing. They shouldn't necessarily avoid monumentality. You can't design an auditorium as if it were a house.

DC But your work is very different from the iconic architecture we've seen in the past 15 years.

AV Though they may be relatively simple, buildings must emit a certain attitude or character. And that doesn't necessarily mean making a design unique. Character is a difficult concept, which I think has got lost along the way. 'Anything goes' isn't the right response for every situation. Nor is the generic, except perhaps for programmes like office buildings. For us, the identity of the architecture is more important than the personality of the architect. And I'd generally prefer the public space that generates a building to become an icon, rather than the building itself.

Peter Eisenman talks to *Iman Ansari* about how the true architecture of his work resides in his drawing of it, and why—despite this—he still feels the imperative to build, in order to be taken seriously

VINGS

I. Peter Eisenman's unrealised Cannaregio project excavated Venice's non-existent past by making voids in the city following the contours of Le Corbusier's unbuilt hospital



Peter Eisenman is one of the most significant architects and theorists practising today, notable for his involvement with Derrida's Deconstructivist project and his pioneering use of computer-aided design. His major buildings include the Wexner Center in Ohio (1989), the Holocaust Memorial in Berlin (2005), and his unfinished City of Culture in Santiago de Compostela (begun 1999). His interviewer, Iman Ansari, is a practising architect, urban designer, and a lecturer in architectural theory at City University of New York.

Iman Ansari In your career you have sought a space for architecture outside the traditional and conventional realm. You have continually argued that modern architecture was never fully modern as it failed to produce a cognitive reflection about the nature of architecture in a fundamental way. From your early houses, we see a search for a system of architectural meaning and an attempt to establish a linguistic model for architecture: the idea that buildings are not simply physical objects, but artefacts with meaning, or signs dispersed across some larger social text.

But these houses were also part of a larger project that was about the nature of drawing and representation in architecture. You described them as 'cardboard architecture' which neglects the architectural material, scale, function, site, and all semantic associations in favour of architecture as 'syntax': conception of form as an index, a signal or a notation.

So to me, it seems like between the object and the idea of the object, your approach favours the latter. The physical house is merely a medium through which the conception of the virtual or conceptual house becomes possible. In that sense, the real building exists only in your drawings.

Peter Eisenman The 'real architecture' only exists in the drawings. The 'real building' exists outside the drawings. The difference here is that 'architecture' and 'building' are not the same.

IA So with that in mind, did you ever wish none of your houses was actually built?

PE No. Let me go back because you raised a lot of questions. If there is a debate in architecture today, the lasting debate is between architecture as a conceptual, cultural and intellectual enterprise, and architecture as a phenomenological enterprise — that is, the experience of the subject in architecture, the experience of materiality, of light, of colour, of space and so on. I have always been on the side opposed to phenomenology. I'm not interested in Peter Zumthor's work or people who spend their time worrying about the details or the grain of wood on one side or the colour of the material on the surface, and so on. I couldn't care less.

Having said that, it is still necessary to build. But the whole notion of 'cardboard architecture' meant that the materiality of the work was important as an 'antimaterial' statement. Probably the most important work I did in the conceptualist realm was the cardboard architecture houses. Pictures of House II, for instance, were taken without sunlight so you have no shadows, and no

reveals or things like that. And in fact one of the pictures we took of House II was in a French magazine that said it was a 'model of House II'.

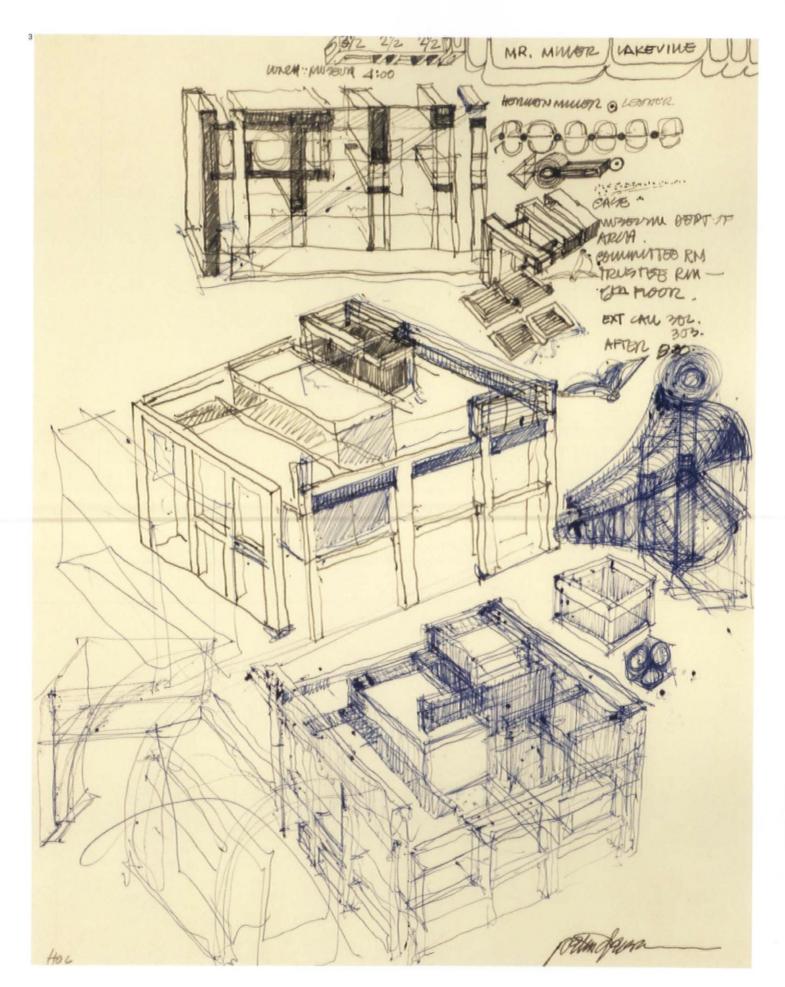
So I achieved what I wanted to achieve. which was to lessen the difference between the built form and the model. I was always trying to say 'built model' as the conceptual reality of architecture. So when you see these houses and you visit them you realise that they were very didactic and very important exercises each one had a different thematic - but they were concerned not with meaning in the social sense of the word or the cultural sense, but in the 'architectural meaning'. What meaning they had and what role they played in the critical culture of architecture as it evolved over time. So while the work was interested in syntax and grammar, it was interested to see what the analogical relationships were between language and architecture. And of course that's when I got into working with Jacques Derrida.

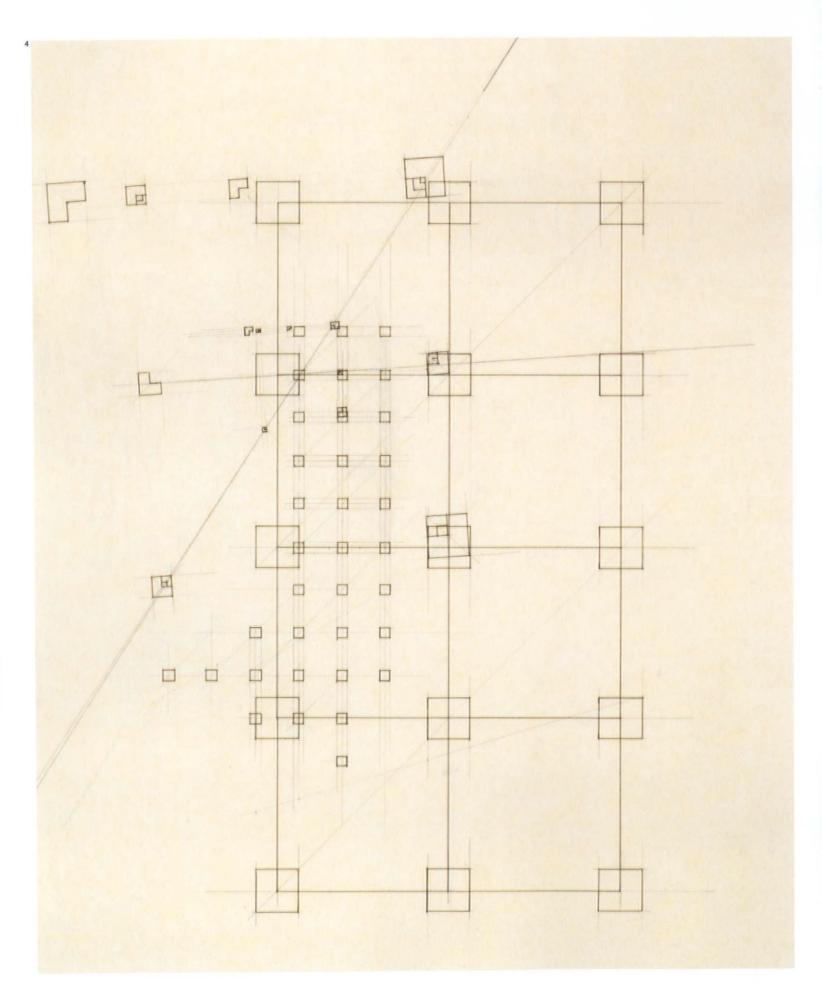
IA What influence did Derrida have on your work?

PE Jacques was important in the later stage of my work because he said that it was possible in language to separate the sign and the signified – that is, the thing and its sign. What has made architecture interesting for Post-Structuralist philosophy is that architecture is about the relationship of the sign to the signified, that the column, for instance, is the sign of the column and the column itself; or the wall is the sign of the wall and the wall itself.

2. A photograph of House II was mistaken for a model by a French magazine, a confusion that greatly pleased the architect 3. One of the 2,000 sketches that Eisenman produced for House II, which make up part of the Canadian Centre for Architecture archive. The project plays a double game of signification and structure by including both columnar and wall systems of support, either of which could be superfluous or necessary







In Alberti's Palazzo Rucellai, there is both a grid system and a wall-bearing system, which says there is a redundancy or duplication of structural systems. This is also the case in my House II where there is a redundant structural system too. I would say my projects are 'Modernist' not only in a Modernist style but also philosophically and critically, in the sense of Nietzsche, Heidegger, Derrida, and others. So when I built House II with a wall system that could support the house and a column system that could support the house, there is a sense of redundancy with the two systems. When you have this redundancy, the walls are either structural or signs. Is it possible, as in language, to separate out the sign and the wall to have what could be called 'free floating signifiers'?

This is where the world starts to become more complex in my work, and more problematic in terms of meaning. And then you get away from the house, because the house is too small to sustain an investigation at a different scale, which gets you to the architectural subject, which gets you to levels of sophistication of representation and lots of things happen.

Now going back to the houses and to conclude that question. First, I never thought that I would want to build anything but houses because I thought that the house gave sufficient room to experiment with nonfunctionalities since there is no one type of functional organisation for a house but there are architectural organisations. But that later proved to be problematic. The second thing was that I didn't believe that it was necessary to ever visit my houses. In other

4. The Cannaregio project - an excavation of architecture's repressed subconscious - was partly a response to Eisenman's own experience of psychoanalysis 5. It was also inspired by Le Corbusier's 1965 Venice Hospital project, designed to extend the road and canal networks of La Serenissima into the lagoon

words, there were houses that for the first six months or year they were open I didn't even go to see them because I thought that wasn't the important thing; the important thing was laid out in the drawing.

The Canadian Centre for Architecture, where part of my archive is, for example, has 2,000 drawings that I made for House II. I would draw and draw and draw because I never knew what I was looking for, I knew the general parameters of what I was looking for, but I had no formula for setting up how to achieve it. Each house had an idea structure behind it. They all had a different investigation and started to get into bigger and bigger ideas and include more and more things that the earlier houses dogmatically left out. So essentially, that was a very important period of my work that stretched from 1967 to 1978 with Cannaregio. In Cannaregio something else happened.

- A Can we pause here for a second before talking about Cannaregio. So do you think because these houses existed cognitively they lost their true meaning the moment they were physically realised the moment the 'real architecture' turned into the 'real building'?
- **PE** Manfredo Tafuri once said something very important to me. He said, 'Peter, if you don't build no one will take your ideas seriously. You have to build because ideas that are not built are simply ideas that are not built.' Architecture involves seeing whether those ideas can withstand the attack of building, of people, of time, of function, etc. Tafuri said history will not be interested

in your work if you haven't built anything. I think that's absolutely correct. If I had built nothing, you and I wouldn't be talking now.

- IA So what would the building mean in that context. Do you perhaps believe that the built house or the 'real building' stands as what you called the 'built-model' of the 'real architecture' that exists only conceptually?
- PE Sometimes it does and sometimes it's beyond, and sometimes it's less. When you go to Cincinnati to see the Aronoff Center, the spatial experience is extraordinary. The didactic drawing itself is another thing. But they are two different things. I had to build Cincinnati, I had to build Wexner, I had to build Santiago, which is my latest project. You have to go and see it because you cannot draw it. You cannot cognitively understand what is going on. One has to see it and experience it in a way that is very different conceptually in terms of what I was after in the first place.

There are three phases in the work. One is the purely conceptual artefacts, which, as you suggested, may not necessarily have had to have been built. Two, are the ground projects, which are at a different scale and many of them had to be built. And finally you have Santiago, which is a hybrid project because it is neither a ground nor a figure.

IA Let's talk about Cannaregio. Your early work was concerned almost exclusively with isolating and elaborating the architectural elements and operations that would ensure the autonomy and self-reflexivity of the architectural object. But in the Cannaregio



project, we witness a new order that initiated the Cities of Artificial Excavation, and characterises your work after that: the movement from structure to site or text, or better, from structuralisation of the object, to the textualisation of the site.

PE Or you could say from the linguistic operations to textual operations — because texts are quite correct about the site but they are no longer syntactic and grammatical; they are other. And if you say the early houses are analogically grammatical exercises to linguistic exercises, these are no longer analogical to language. I have lost the faith that language could be somehow an analogous model for architecture. I thought I had to find what I was doing within architecture rather than without architecture. So the reading that I'm doing, the work that I'm doing, has much more to do with the text of architecture.

And that didn't happen accidentally. The first architectural Biennale was Europa-America. Even though Paolo Portoghesi would like to think the Strada Novissima in 1980 was the first, Vittorio Gregotti's Europa-America in 1976 was. I had met Vittorio some years earlier at a conference in Spain, and he had appointed me as the head of the American section of the first architectural Biennale in Italy, which included Raimund Abraham, Emilio Ambasz, César Pelli, and a great montage of American architects.

At the same time I was supposed to be finishing the working drawings for House X. The client had dug a hole waiting for September to begin the project. I spent the whole summer in Italy and I didn't pay

'I'm not interested in Peter Zumthor's work or people who spend their time worrying about the details or the grain of wood on one side or the colour of the material on the surface, and so on. I couldn't care less'

attention to the working drawings. I came back and the working drawings were not done, and the client was furious; he fired me and refused to pay my bills.

IA What effect did that have on you?

PE I was depressed. I realised that my intellectual, or cultural, side, and my entrepreneurial side had got way out of whack with where I needed to be. So I went into psychoanalysis, and in analysis I began to learn about the difference between living in your head and living in your body, with the reality of the earth, the ground.

When Tafuri wrote 'The Meditations of Icarus' in *Houses of Cards*, he meant that Peter Eisenman was Icarus, and to be Icarus meant that you wanted to fly and to look into the sun, as Icarus did. And to look into the sun meant that you were totally out of touch with the reality of the earth and the ground. Icarus, of course, gets too close to the sun, his wings of wax melt and he falls to earth. Icarus was the son of Daedalus, who made a labyrinth that was guarded by the Minotaur. It was an interesting mythology, which had to do with the ground, digging into the ground and making marks on the ground.

Through my psychoanalysis sessions I realised that what was wrong with my architecture was that it wasn't from the ground, from inside the unconscious, beneath the surface. So the first evidence of this occurs in Cannaregio where for the first time I do a project that is totally in the ground. And it's not only in the ground, it's also urban. But it's also not real. It's conceptual; and uses

Corbusier's unbuilt hospital project as an initial context. This is in 1978.

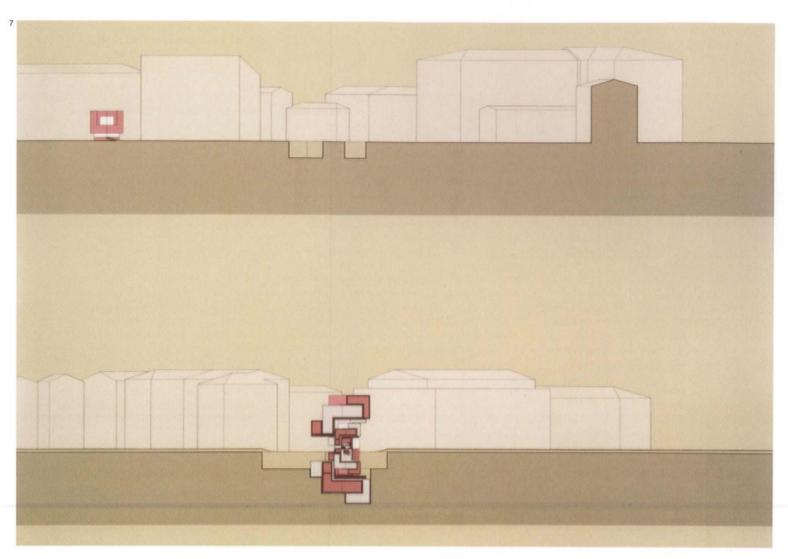
In 1980 I'm invited to Berlin to do the Checkpoint Charlie project, which includes the garden of walls. You can't walk on the ground of Berlin even though it is a project inscribed in the ground. And then I do the Wexner Center. A number of these projects fall within the concept of artificial excavations. The ground afforded me a critical dialogue with the then current (1978-80) theory of Figure-Ground Architecture: the black and white drawings of Colin Rowe and the Contextualists, work done for Roma Interotta using the Nolli map of Rome.

What I was doing was the reverse. I was attacking the historicising obviousness of 'figure-ground' and trying to make what I call a 'figure-figure urbanism'. And that of course had to do with my interest in Piranesi, and Piranesi's Campo Marzio — actually we did an exhibition at the Venice Biennale last year on the Campo Marzio. So all of these things come together. It's not all gratuitous or superficial, in a certain way it's a kind of life work for me.

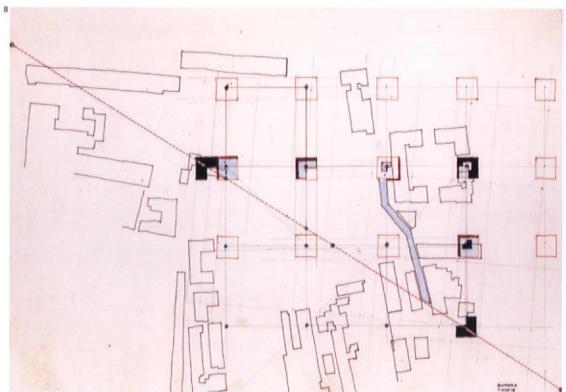
My own psychological work and my own thinking, my teaching, is of a piece. I cannot say that the first period was better or the second period was better; they were different and I was at a different stage in my life. And they all have relevance; they are both in text and in built form. I have both built and written in all three phases of my work. So that's basically how I get to Cannaregio.

IAI want to ask you about the use of Le Corbusier's hospital in Cannaregio. Here you are suddenly confronted with the idea of a site





Cannaregio:
6. A model reveals
the dispersed elements
7. These interventions
were a meditation on
presence and absence,
figure and ground
8. The ghostly grid
of Corb's hospital is
superimposed on Venice
to plot out the project



— a real site, and in fact a very rich one: Venice. Yet, interestingly we see that even then, your approach was to invent a site, in fact an 'artificial' one. And what interests me the most is how you used Le Corbusier's unbuilt hospital in Venice as point of departure, and used the grid of the hospital as a generative system in your project.

And finally when you draw the project you include the hospital with your project with no notational difference. How do you read Le Corbusier's hospital in your drawings? Were you suggesting that the hospital is part of your proposal and meant to be built along with your project? Or were you implying that your project should also remain unbuilt as Le Corbusier's hospital did? Or was it neither or both? A meaningless clue?

PE First of all, it's not a meaningless clue. But I was suggesting neither. You are reading them in an interesting way, but I didn't think about that. Here is what I was thinking about: I needed something in the site, in the context of the Derridean notion of absence and presence. To me the discourse of absence is very important in the ground projects and in the idea of the trace. Freud talks about how Rome was built on a series of traces of levels; that going into the unconscious is digging into the traces of history that have been sedimented; your own history, cultural history that you have to get at. And so Corbu offered one layer of that cultural history.

In other words, you'll see in Berlin I did the same thing with the grid of 1760, the grid of 1830, and superposition of traces, which is how Rome evolved, how Berlin evolved,

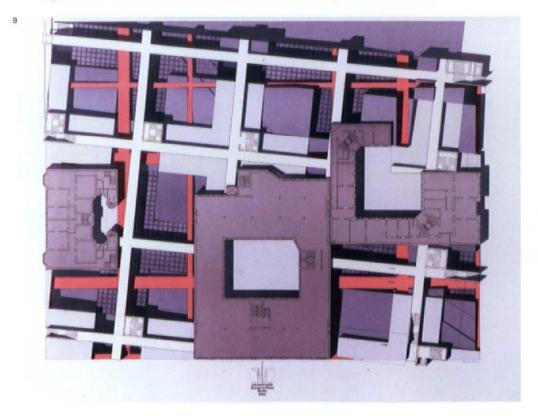
'I watch people in this office sitting and looking at these things on their screen as they roll them around in space, and I think to myself: what the hell are they doing? It is nuts, it's totally wacko' how cities evolve. I have always been interested in the evolutionary process of the physical traces left by the previous building. It didn't matter if it was built or not built, and it didn't matter whether I was going to build my project or not. What mattered was the idea of using the trace as a key, as a beginning to project something, to make a project. To me Cannaregio was the turning point in my work. It is that hinge that Derrida talks about, the hinge between the before and after. So it becomes an important project. It was necessary to find a way to make a project — because there was no programme.

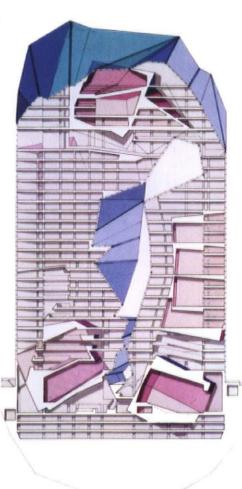
And if you notice, all the projects were different. Venice was losing population; it didn't need housing, it had an adequate housing stock; so I said, let's make holes, and that's what I did. But also, is the ground the holes or is the ground the stuff around the holes? And is the figure the ground? And the kinds of questions that these pose. And of course the question of scale came in, because I used my House IIa here at three different scales: a real scale or the house scale, and model of the house scale, and then the house becoming the model of a larger project. So the question of scale came in which had never been in my work, the question of ground came in, the question of trace came in, and many of the issues that would subsequently articulate my work are manifest in Cannaregio.

But looking back, can I say I was conscious of all these things I'm telling you? I don't think so. No matter how conscious the work seems, a lot of it was swimming under cloudy water trying to find the edge of the pool where I could get out. It wasn't so clear that I knew exactly what I was doing. I never have known what I was doing. In fact I teach the idea of project in my classes at Yale, and I still don't know what my project is. I know I have a project; I know Le Corbusier had a project; I know Mies had a project. If you said look Peter, you talk a lot about the idea of a project, what is your project? I'm still trying to figure out what my project is.

IA I think my understanding of Cannaregio and the use of Le Corbusier's unbuilt hospital as the point of departure is that the hospital becomes for you what Venice was for Le Corbusier: a site, but here it is one that is not actually there. And what that brings me to is the role of drawing. If the drawing is the site, then the drawing is there, but if Venice was the site, Le Corbusier's hospital wouldn't appear there. The Cannaregio project only makes sense as a drawing. So it seems to me that drawing in your work emerges as the fundamental medium analogous to writing in language. So with the advancement of our tools, do you think that drawing's role (that direct cognitive relationship with the drawings and the physical act of drawing) is diminishing in contemporary architectural practice?

PE I will tell you this: I cannot read a book on Kindle. I have to own a book, and I have to write in the book. When I read I take notes, I go back over it. You can see my books are full of notes in different pens and colours and times because when I read a book today that I may have read 10 years ago, I read it differently: because I'm different. I have





to take notes over time in books, so I own books. That's number one.

To me, drawing and reading are the same thing. I can't read on the computer. So when someone draws something on it, I print it so I can draw over it either with tracing paper on it or without it. You cannot make a plan in the computer by connecting dots. You have to think about a diagram or what it is you are doing. You have to think in drawing. So to me, all of my work, even the last competition that we won in Turkey, is drawn by hand first, then we give it to computer guys and they model it and then we get it back, etc.

Drawing is a way of thinking. I can't think or write ideas on a computer. I don't type on a computer. I write and if you look at my desk, it's full of paper. So to me drawing is a form of writing, and a form of reading what I write. I don't see any difference. To me drawing is not making pretty things or making representations. It's not representing anything; it is the incarnation of the thing. I'm not trying to represent something; I'm trying to make it real. And the only way it can be real is through my drawings.

Architects and architecture students today have lost the essential capacity to think through drawing. They can only think through a computer. I watch people in this office sitting and looking at these things on their screen as they roll them around in space, and I think to myself: what the hell are they doing? It is nuts, it's totally wacko. You know, what does a section look like? What does a plan look like? They don't seem interested in that.

IA In that sense drawing almost comes as an afterthought. Once you model the object or the 'thing' in 3D, then you can cut plans and sections of it.

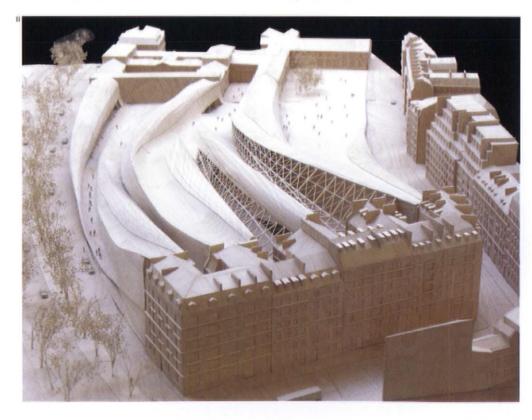
PE Exactly, but I start with the cuts. I build from the cuts.

IA You have said before that if we as architects make two or three 'canonical' buildings in a lifetime — buildings or architecture that is on the edge, that's already a lot. I want to ask you, which one of your projects do you think is the most canonic, in that it represents those critical moments in your work? Or which project do you wish to be remembered by?

PE Well, I would say Cannaregio would certainly be the first but it's not built, and you have to have a built project. Then it gets fuzzy. I can't tell about Santiago because it's not finished yet. Berlin is too off on the side. You might say my Cincinnati project. You could say the Reinhardt Haus, but again it's not built; it's a provocative project. My favourite unbuilt project was the Quai Branly museum in Paris. I think it's a fantastic project and I really wanted to build that project.

But there are so many projects — over 150 projects, and I only built about 25 of them. But here is where I think your question is wrong. I believe that some of the texts are as important as the building projects. Because I'm not just a 'building architect', I'm also a 'writing architect' and a thinking architect and a teaching architect, so to me the writing is as significant in my work as the buildings because they are both the same.

9. Eisenman's Checkpoint Charlie project for the **Berlin IBA represented** another approach to urbanism, history and absence - this time by reviving the grids of 1760 and 1830 10. The unrealised Max Reinhardt Haus was to be a 34-storey Möbius strip designed to memorialise the great impresario 11. Eisenman says his Quai Branly Museum in Paris is his favourite unbuilt project. All images are from the CCA except 2, 6, 8-11 (all from Eisenman) and 5 (Fondation Le Corbusier). Images provided by the **CCA** are from the Peter Eisenman fonds, Canadian Centre for Architecture, Montreal: cca.gc.ca/ findingaids/eisenman



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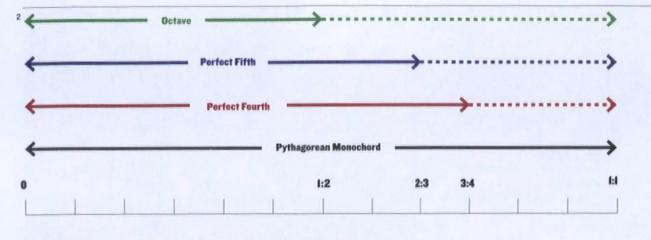
I. Notre Dame nave, the canonic view experienced as a whole. Its spatial proportions of width to height – 1/2.7 – enhance its spiritual meaning. Music is experienced over time, whereas architecture is grasped as a spatial whole

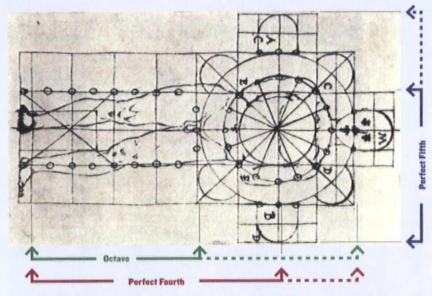


ARCHITECTURE BECOMES MUSIC

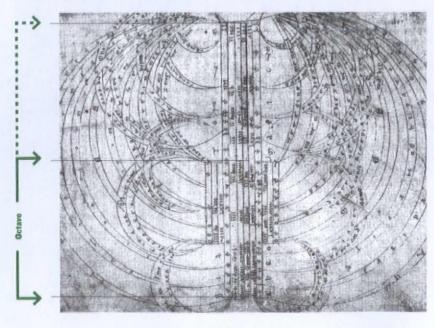
As abstract art forms based on rhythm, proportion and harmony, architecture and music share a clear cultural lineage. Now, through digital expression, architecture can attain new heights of creative supremacy

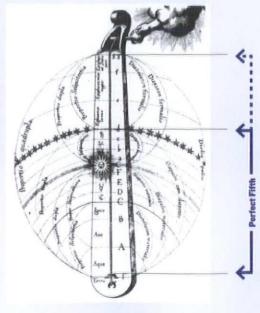
CHARLES JENCKS





2. The Pythagorean Monochord (top) like a cello tuned by God, revealed the cosmic connection between harmonic sound, whole numbers, perfect proportions, geometry and then architecture designed on the same ratios. The human body (middle) also disclosed these proportions and thus the plans of cathedrals certain lengths – were ordered to these ratios: the 'perfect octave', (diapason), 'perfect fifth' (diapente) and so on. This system of harmony was worked through for three voices during the Gothic period (lower left), and the system was itself 'perfected' in the Baroque period (lower right). With God still fine-tuning and (centre of drawing) the sun, moon, 'fire, air, water and earth' presiding over the cosmos, architecture was inevitably designed to reflect this music









'All art' Walter Pater famously observed in 1877, 'constantly aspires towards the condition of music.' Why the music envy? Because, the standard answer goes, in abstract music the form and content — or in its case the sound and sense — are one integrated thing. Pater's aphorism became a good prediction of the zeitgeist and the goal for abstract art in 30 years as the painters in Paris and elsewhere pursued a kind of visual equivalent of musical themes, and Expressionist and Cubist architects followed suit. Indeed architecture as 'frozen music' had a long history of tracking its sister, the parallel art of harmonic and rhythmic order.

Many qualities unite these two art forms — and quite a few make them different — but it is the former I find compelling today. Their shared concerns can be seen in ceremonial architecture from the ancient Brodgar Stone Circle to concert halls, in structures that heighten the senses and make one perceive more sharply and emotionally. In an era when museums and other building types emerge as a suitable place for musical ornament, and when expressive shapes can be produced digitally, architecture could reach its supreme condition once again and become its own particular kind of music.

The cosmic codes

Since at least the sixth century BC, music and architecture have been intimately joined by a cosmic connection, the idea that they both are generated by an underlying code. This order, revealed by mathematics and geometry, was first espoused by Pythagoras who lived in southern Italy, and it led to many Greek temples designed on proportional principles revealing not only supreme beauty but 'the music of the heavenly spheres' — either God or nature. The idea was so appealing that many later designers tried to capture the notion with new materials. For instance, as Rudolf Wittkower argued, Renaissance architects saw the cosmic connections in simple ratios such as 1:1 (a sound repeating itself, or the architecture of a square room), and 2:1 (the octave, a string doubled or halved in length, or in building the double-square front of a temple).

So far so simple, one could explain these analogies by vibrating strings and, as Pythagoras was supposed to have heard, a blacksmith hammering away with instruments of different size. He and others compared the harmonic results to the rhythms of a well-proportioned building, and the code of musical architecture was born. Perfect geometrical figures were equated with perfect whole numbers -1, 2, 3, 4 – and then with the perfect harmonic sounds they produced (called 'the perfect octave, the perfect fifth (3:2); the perfect fourth' (4:3) and so on.

The Greek temple epitomised such connections for another reason, it was a building type created around musical performance, where the perfect form of the stones literally reflected the sounds of dancing, of flute playing and singing in procession. Its columns and intercolumniations created a steady beat of solid/void that was particularly staccato when seen head-on: A,B. These rhythms were conventionalised and named so the architect could speak the dimensions.

He might say, 'Let us try the *Pycnostyle*, the fastest beat of intercolumniation.' The *Systyle* and *Eustyle* were

'Architecture as 'frozen music' had a long history of tracking its sister, the parallel art of harmonic and rhythmic order'

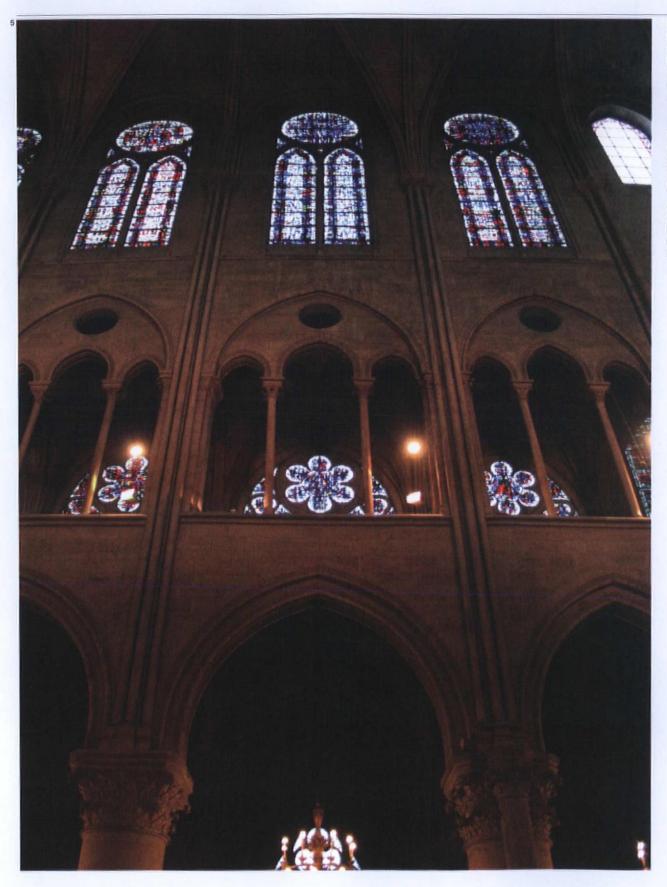
for middling speeds, and *Diastyle* and *Araeostyle* used for the slowest, stately rhythms, but he would have been something of a pedant to have gone through the list of options. The fact is that virtually no layout drawings of Greek architecture or music survive (though like the Egyptians, architects must have scratched plans on the stones before construction). We do not even know the notation systems of either profession, and it may well be that the composers of both arts 'spoke their creations' like little gods. This verbal creation was more likely in music, because it was taught as one of the seven great arts and committed to memory by hard training: geometrical ratios then united it to ceremonial architecture.

In spite of this geometrical harmony, differences between the two arts emerge which are as instructive as the similarities. When the temple columns are seen more obliquely, the ornamental fluting becomes like a solid wall of vertical rhythms, and these accelerate even further with a tighter angle. How different this is from a symphony which cannot, ordinarily, be sped up or slowed down by the perceiver; or read backwards as architecture can be from the exit; or top-down as with a skyscraper.

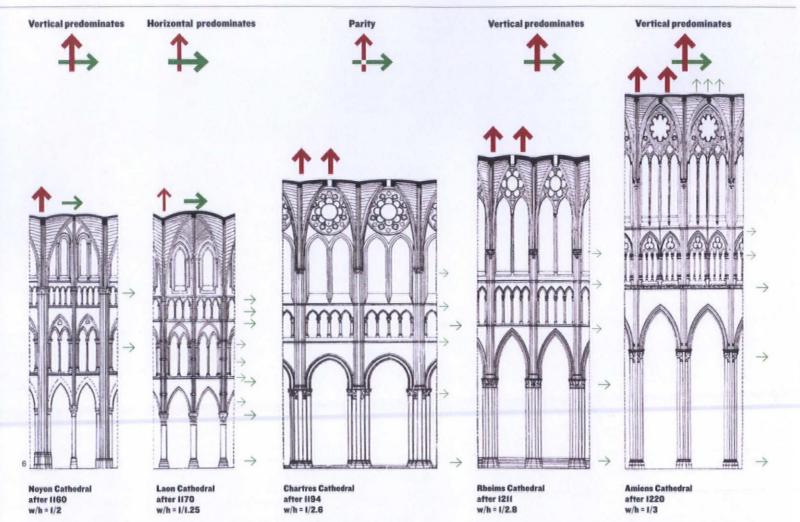
Architecture is a variably perceived art. It is correctly experienced from several distances and speeds of movement, a property exploited by Peter Eisenman with another staccato composition, his monumental field of separated cubes in Berlin, both an abstract urban pattern and a memorial. Like the Greek temple, it induces the feeling of finality by the absolute contrast between sunlight and blackness. As one explanation for the design. Eisenman described a mood of fear that he experienced when lost in an Iowa cornfield without any cues of orientation or scale. His endless, undulating ground of large concrete blocks naturally expresses this feeling of panic, when one descends into its agoraphobic abstraction. Like the Greek temple, it makes effective use of an isolated, staccato beat - Light/Dark, A/B - but now to send another message: presence/absence. This meaning is further emphasised as you see people suddenly appear and disappear randomly, as they walk through the Holocaust memorial, coming into view suddenly only to vanish. Such naturalistic meaning is as violent as a trumpet blast followed by stillness, or a shriek by silence, and it exploits another convention common in music. Just as the funeral dirge has a remorseless build-up to the inevitable declining notes, so the memorial's blank coffins thump up only to steadily trail away, like the descending line of a dirge.

When music and architecture use such natural and conventional meanings in so simplified a form they raise emotions to a high pitch. The Gothic cathedral proves the point, especially while music is being performed on the inside.

3. Temple of Concord. Agrigento, Sicily, 450 BC. This view shows the Pycnostyle in front, and a screen of flutings on the side, because of viewpoint an even faster beat. Pythagorean proportions of column to intercolumniation, front to side, and width to height (roughly 2:1 here) also determine many other relationships of the **Greek temple** 4. Peter Eisenman. Memorial to the Murdered Jews of Europe, Berlin, 1998-2005, another contrast of violent, staccato elements



5. Notre Dame interior, bay rhythm and its three superimposed levels.
Each of these horizontal areas can be seen as a different choral voice. At the time, 1240, the composer Pérotin was superimposing one plainsong chant on top of another: musical and architectural harmony developed in parallel through notation systems. The notebooks of Villard de Honnecourt, circa 1240, show the nave elevation of Reims cathedral, and reveal that he appreciated its rhythmical subtleties



6. Evolutionary series of the High Gothic over 60 years. The horizontal emphases are in green, the vertical in red, the oppositions are pushed to greater and greater pitch, as the dialectic of visual forces dissolves the wall. For instance, note the central colonnette of the Amiens triforium that is thicker, like the one Villard drew at Reims to show the vertical emphasis

By the year 1200 architectural drawing and musical notation were more common, and a few examples of both survive. The composer Pérotin, working at Notre Dame in Paris, introduced a notational system of long and short notes so he could signal basic rhythms – Dum-ti, Dum-ti, Dum-ti, Dum – just as Gothic architects were working out complex alternate bay rhythms – A,b, A,b, A,b, A. Note in this example both music and building start here on a long stressed element (Dum or A) and then skip forward on the half-beat (ti or b). Note the nave elevation of Notre Dame where these rhythms are marked in several ways, such as the engaged colonnette on every second pier (which also marks the sexpartite vault above), A,b.

The parallels between architecture and music are extraordinary. Pérotin and his musicians were working out the harmonies of three and four melodies stacked above each other. These often moved in great blocks creating harmonic chords pleasing to the ear. Architects were also stacking three or four levels (arcade, triforium, gallery, clerestory) in equivalent chords pleasing to the eye. The architectural melodies did not run in as strong opposition as the music. They were smoothed along and ran parallel in horizontal chunks; but there are decorative elements that give the architecture a subtle counterpoint.

These sub-rhythms are particularly evident if you examine the evolution of Gothic across time, as shown in the diagrams. These drawings bring out the way four levels of Noyon and Laon are synthesised into the classic three, at Chartres, and then further squeezed and stretched upwards, as the wall dissolves in ever greater light at Reims and Amiens. Little mouldings buzz along the horizontals that accentuate the melodic lines, while more and more colonnettes whiz up the verticals accentuating the harmonies. The great architectural dialectic of horizontal versus vertical forces starts here and culminates in the early skyscraper.

The musicians of Notre Dame loved the architectural polyphony, and even outperformed it. Their experiments with four voices, and simultaneous clusters of chords, are more complex than the nave elevation and much cheaper to build in music than stone. They emphasised harmonic ratios such as 3:2 (called with explicit Godly overtones, 'the Perfect Fifth') and 4:3 ('the Perfect Fourth') and drew them on lined bars as if they were the cornice lines drawn by the master builder. Again consider the analogy where it works and breaks down. The five horizontal lines of musical notation — the staff — and their four spaces between are roughly like the parallel horizontal 'melodies'

of the four-part nave elevation, reading left to right as one approaches the altar: except the musical melodies cross the five lines, while the 'chords' of architecture stay mostly locked between the string courses.

Pérotin and the musicians of Notre Dame pushed on to ever more subtle harmonic relationships of 5:4 ('the Major Third') which was more upbeat and happy than the poignant ratio of 6:5 ('the Minor Third') which became common to the melancholic laments, their *Miserere*. There is nothing exactly equivalent to these heightened emotions of happiness and sadness in the architecture except, maybe, the stained glass and gargoyles, or an outbreak of fan vaulting, or any artistic accent so essential to mood and meaning.

The phrases in scare quotes ('Perfect Fifth') are hard to learn at first because they refer first to physical notes on a keyboard and only afterwards to the underlying ratios and sounds you hear. But the insights and terms have also led to subsequent innovations in Western harmonics right up to the present, and even become standard ideas for global music. And one could point out that the jargon of architectural relationships, the 'triforium' and 'colonnettes' or today the 'spandrel' and 'I-beam' are equally esoteric, but important for the deeper effects.

This raises an important point about perception. Great music and high architecture are sometimes most appreciated when they are imperfectly understood, which is not to say that the composers of each were not aware of their craft. But it is to say the emotional experience of each is very different from the analysis, a point brought out when you enjoy a building inattentively as part of a background (the argument of the philosopher Walter Benjamin and mass culture theorists).

Again, examine the contrast between architecture and music in Notre Dame. Where do you stop, look and listen hard, as you are supposed to do with a symphony? Probably where you rest on a seat and contemplate the space of the nave as it rushes to the altar, an experience quite different from viewing the side elevations. The first are solid and stone relationships set in sequence, now it is the void and space seen as a whole, and contemplated with the entire meaning of the church (the heavenward gesture, the structure like a communal 'boat', and associations such as primeval forest). So in this holistic grasp the two arts seem opposed. We take the space in at a glance, while music is necessarily experienced in parts over time, and the two media are as opposed as light waves from acoustic waves. Such oppositions have been emphasised since the 19th century, and more of that later; but what about another positive link beyond harmonies and proportions?

'The five horizontal lines of musical notation — the staff — and their four spaces between are like the parallel horizontal 'melodies' of Notre Dame's four-part nave elevation' Above all it is the heightening of emotions which in music, and with cathedrals and concert halls, is a common goal. Musicians are often taught the six basic moods, and modes, they can stress — sadness, joyfulness, fearfulness, tenderness, love and anger — and emotional articulation could be defined as a purpose of music. With architects today it is sometimes the reverse, especially when they are taught to avoid explicit moods and attain a neutral background; or avoid any explicit meaning. But in spite of this they still respond to the funeral dirge and dance music.

The ultimate holistic experience? Sydney Smith famously gave the secular definition of heaven as 'eating foie gras to the sound of trumpets' a kind of supersynthaesthetic peak-experience to which an atheist architect added 'but only in the nave of Notre Dame', a waspish answer that brings out the power of emotional architecture. You only have to listen to monks chanting in the 'acoustic ears' of Le Corbusier's Ronchamp to hear the point; or, less grandly, to sing aloud in a tiled shower. The reverberation of overtones captures the synergy.

The cosmic codes that are performed by such music and architecture do not require beliefs so much as the ancient idea that we are tuning-forks for holistic experience. With the rise of modernity, however, this tradition of anonymous, collective design — and musical composition — was partly displaced by the named architect and composer, sometimes a celebrity. New notational systems aided this development after 1500 along with new materials, new instruments and the emphasis on the individual creator.

The plurality of new codes

In The Story of Music, 2013, Howard Goodall tells this tale of expanding virtuosity and the composers who became public figures, impresarios such as Vivaldi. As the example of Michelangelo shows, the same pattern occurred with celebrity artists and architects. Their personal styles and motifs competed with the traditional modes, which then started to feel stiff and old-fashioned. For every Monteverdi who invented new madrigals and forms of opera there was a corresponding Borromini, the author of new spatial concepts and formal moves in architecture. Competitive innovation has gone on since the 17th century and today, in architecture at any rate, we have a bloom of personal styles dominating the scene, albeit working within various modernisms. Revner Banham called Le Corbusier 'The Last Form Giver' in 1968, and foresaw the end of this tradition, but his prediction proved wrong.

From Ando to Zumthor, from Eisenman to Gehry to Hadid to Libeskind to Wolf Prix and back again; from Koolhaas to Herzog & de Meuron, or in engineering from Calatrava to Balmond; from the recent generation of digital designers, the '90s Blobmeisters such as Greg Lynn to the 2000s Parameisters such as Patrik Schumacher; from curved to angular fractals wherever you look new languages of architecture are proliferating, idiolects are defined, and form-givers flourish. Critics understandably chide these Starchitects, but the jibes and moralising have not halted their proliferation any more than did Banham, and they miss an opportunity to see the growing genre in a different way and explain it to the public.

7,8. Daniel Libeskind,
Jewish Museum, Berlin,
1989-2001, using the
natural expression of
dissonant angles,
descending lines,
discordant cuts and
slashes, and structures
breaking through
each other





'Libeskind, Gehry, Prix have composed parts of their buildings with inspiration from Schoenberg and '60s pop music; while others are pushing explicit compositional forms: Eisenman, Koolhaas and Hadid'

Besides, fame and notoriety are less valuable than the new architectural music, and this burgeoning movement asks to be criticised as such, in its own terms. Some designers have explicit music in mind: Libeskind, Gehry, Prix have composed parts of their buildings with inspiration from Schoenberg and '60s pop music; while others are pushing explicit compositional forms: Eisenman, Koolhaas and Hadid. Let us return to where architecture and music have similar intent: extreme emotional arousal.

Extreme emotion and neutrality

When he was 24, Le Corbusier experienced the Parthenon in vivid metaphors - 'a brazen trumpet that proffers a strident blast. The entablature with a cruel rigidity breaks and terrorizes ... The Parthenon, terrible machine, pulverizes and dominates everything for miles around'. Is it heroic angst or piercing beauty? A heightened response to the Parthenon often occurs - Louis Kahn also described his rapt experience here - and it partly depends on the dramatic approach and journey up to the Acropolis. Music, as we will see, has its counterpart to this drama in the progression of chords up to a climax or cadenza, or down to a 'home'. Le Corbusier's violent metaphors, the temple blasting out like a 'brazen trumpet', or gun, epitomise the response to so much Greek architecture while the opposite architectural emotion - serene, harmonious peacefulness - is evoked by the Taj Mahal, especially when seen at dawn through the morning mist.

Heroic anger and optimistic passion typify much martial music just as competitive joy epitomises the duets of Mozart, which were often written along with a libretto dramatising the battle of the sexes. Stereotype and genre lie at the base of both music and architecture - the funeral dirge taking place in a mortuary chapel, a pop concert in a stadium - and composers in both arts have to wrestle with the entropy of cliché, which always threatens to devour their reputation. Daniel Libeskind, who pushes architectural emotion towards melancholy and fear, sometimes succeeds. His Berlin Jewish Museum is the supreme example of memorialising sadness, terror, the Cool Horrific. It is even more powerful than Eisenman's great work, to my mind, because it calls on so many more contrasting tropes. The zigzag path one walks on is set against the Holocaust void one cannot enter but always cross; the slashes and cuts in the exterior grey zinc contrast with the tilt of the white concrete stumps (out of which willows emerge wafting a peaceful note).





Oppressive concrete walls set off liberating views of the sky, and so on through the play of violent diagonals versus a background of neutral grey. Libeskind, a trained musician, who has designed a series of architectural *Choral Works*, is obviously sensitive to analogies between the two fields, and the visual tropes I have mentioned have their musical counterparts.

For instance, his long thin stairway, punctured by angular struts and underscored by dark stone, is a natural echo of the mood created in Albinoni's Adagio in the key of G minor. This has a descending base-line that repeats again and again – 'going down, going down' as it were – a naturally expressive form of sadness, as stereotyped as using a minor key in the context of death.

For the museum addition, Libeskind was particularly inspired by Arnold Schoenberg's last opera, the unfinished Moses and Aaron. Schoenberg, the quintessential modern 12-tone composer, breaks off his opera at the point where Moses and Aaron are unable to complete their mission with the people of Israel: 'Oh word, thou word that I lack!' Moses laments his inability to lead the people to the promised land. The building's central void expresses this inability to speak the word, while the zigzag plan shows Aaron's determination to go forward, nevertheless. Few false notes are struck in this memorial to the Berlin Jews. The public can feel the stereotypes without the corruption of cliché, because they are transformed in slight ways and subservient to the meaning of each part in the journey.

What is the architectural opposite of angst - joyful excitement? That is one of the stereotypical moods hardest to sustain. As every wedding march hopes to achieve, as every Olympics opening ceremony is required to produce, joyful-happiness is a trickster. It comes best as an uninvited guest, a by-product of something else, typically as a result of pure, formal invention. A case in point is Sauerbruch Hutton's museum in Munich which became a dazzling work of Op Art because of road noise that had to be deflected. The functional requirement led to a visual blur that dances around in front of your eyes and even changes colour as you approach and recede. On a musical level it is a type of visual jazz, or mad pizzicato, or extreme blending of many tones called chromaticism. On a visual level it is an optical illusion of pixellations; as the observer approaches and backs off the small tones converge into larger areas of identity, like the canvasses of Seurat and the Pointillists. The digital age has an aesthetic obsession with the 'all-over blend' and the 'seamless joint', the integrated gesture.

In the 18th century, however, extreme contrast was sought. As the concerto turned into the symphony, composers such as Mozart juxtaposed joyful play versus seriousness. Underlining this opposition, the whole orchestra was set against a soloist, or — with Beethoven's signature trope — the loud flourish was followed by absolute silence. The last was something so emphatically missing as to turn a void into an architectural solid. Many architects since the 1970s have been emphasising the 'positive figural void' — particularly Michael Graves and James Stirling — but in practice no one has achieved it with such sheer cataclysmic pleasure as Wolf Prix of Coop Himmelb(1)au.

9.10. Sauerbruch Hutton. **Brandhorst Museum** Munich, 2008-11. The stripes of colour are tilted in horizontal layers to deflect the road noise from the museum and muffle it, a clever invention that won the competition for the architects and, as a by-product, created the haunting set of joyful illusions that change with the distance of the observer. The sliding and shifting between visual chords here produces a literal version of musical chromaticism, the blending of colour overtones 11,12,13. Wolf Prix, Coop Himmelb(I)au, BMW World, Munich, 2003-10. The flat roof and a simplified palette provide the major chords that hold together the swooping glissando and trumpet blast at the entrance corner. Shapes, geometries and materials morph together like the continuous slide of an electronic guitar: do these 'energy progressions of Prix amount to 'chord progressions'?

'One rhetorical flourish recurs in Prix's work, the sliding glissando. This sweeps over every material and form, blending them to keep a unifed experience while counter themes erupt'

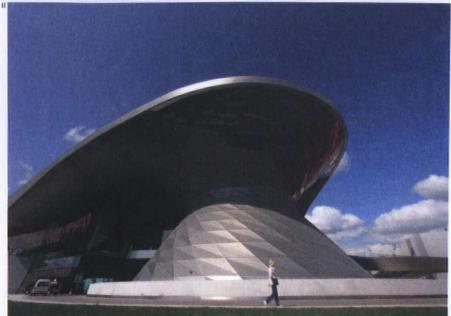
Most of his large public spaces have a highly sculptural figure absorbed into and yet contrasted with a background massing, particularly the roofline. A case in point is his BMW headquarters in Munich, a showroom amplified into a frozen swoosh of polished gun-metal. If the silver streak of automotive movement ever needed expressing it is found here. At the intersection of two high-speed roadways Prix's favourite motif of the double cone announces the main theme like a Beethoven flourish. But it is then modulated in a horizontal direction very effectively, to slide up and down in counterpoint with the flat line above. The contrasting and smoothing of elements 12 work to great effect. The building has some explicit musical inspirations, just as does the contemporary Frank Gehry's Music Experience Building in Seattle, which is based on Jimi Hendrix and '60s rock music.

'I want to build string sound', Prix has said on occasion, and one rhetorical flourish recurs in his work, the sliding glissando. This sweeps over every material and form, blending them to keep a unified experience, while counter themes erupt here and there – dissonances and violent shrieks. A 19th-century composer might have recognised the *Sturm und Drang*. Prix pushes improvisation hard as does his favourite Rolling Stone, Keith Richards, and like his exemplar, he contradicts himself.

An article on the Rolling Stones (Rolling the Sky, 1995) starts with the trumpet flourish: 'Architecture has absolutely nothing to do with music,' and then proceeds to enumerate a few good analogies such as, 'the way that Keith Richards plays rhythm guitar ... generates an energy that can be compared metaphorically with the energy progression of our constructions'. Particularly inspiring for Prix is the 'open tuning' of Richards obtained by removing the sixth string on a guitar in order to slide and glide even more, and to achieve fresh and unheard-of chords, hanging in space. The interior of Coop Himmelb(l)au's BMW-World slides around like the electric guitar and becomes another explicit metaphor for the architect. Such 'open tuning,' as it is called, turns into another of Wolf Prix's favourite ideas: the 'open space' for the Open Society. That was also the underlying dream of both the philosopher Karl Popper and the '60s student movement, and a large communal open space is found

But the opposite of these pyrotechnic gestures, an understated architecture which manages to be interesting, is just as hard to bring off as understated music. Countless architects today aim at minimalism and what was called in

in all Prix's iconic architecture.







the '60s 'businessman's vernacular'. Other competing modes of neutrality, Contextualism and the Neo-Georgian, are just as prevalent as Default Modernism, and together they raise the nagging question of conformity in architecture and whether there is any musical equivalent (except muzak)? Not Philip Glass, nor John Adams; and I cannot think of any equivalent today of the two Bachs, who knew how to compose superior background fugues that transform mathematical patterns.

Creative background art raises another perplexity. Architecture has a required flip-mode that seems to be unique, and appreciated for so being. It is admired for being an artistic foreground but, with a shift in perspective, it flips into the background and becomes valued as urbanism. This change is not demanded of sculpture, or painting (unless a Tiepolo ceiling), or music (unless performed for special circumstances). The flip mode as contextual counterpoint will be considered next, but there are several designers who have built a background contextualism that still remains interesting, and relevant ecologically: Alison Brooks, Bill Dunster at BedZED, and above all Alan Short, who has worked at impossibly constrained sites with low budgets. For instance, his building for Slavonic studies, in a traditional London brick context, produces a low-key music. It manages to squeeze extra floors and numerous eco-requirements into a streetscape while also giving an understated rhythmical complexity that enlivens the long city block: vertical, horizontal and even diagonal patterns of movement.

'It is Herzog's 'visceral impact' of the large contrasting blocks of colour and material — indeed all the primitive themes — that are reminiscent of Stravinsky's violent musical contrasts'

Meaning, rhythm and force

Architecture and music thus are not only supremely emotional, at moments, but semantic and meaningful at other times. It has probably always been so, but since at least the 16th century, music explicitly has employed pictorial and programmatic themes referring to nature's moods, such things as rain storms and mountain ranges. Musical genres, as mentioned, developed their special themes for weddings, funerals, making love and war, all the modes and stereotypes that have been transformed from the time of the troubadours to the Beatles. Such pictorial and symbolic music reaches its greatest height with early Stravinsky, although he later disputed the idea.

His Sacre du Printemps, 1913, uses Russian folk tunes and martial drumbeats to personify the aggressive rhythms of nature and city life. Here he collages themes together as discordantly as any Cubist, and uses dissonant accents like a 12-tone composer. But unlike the atonal musicians, Stravinsky keeps a compulsive forward movement to his ballet music, by shifting emphasis from one agent to the next - from rhythm to theme to progressing chords. Music must provoke our expectation to want the next moment. Call this latent desire the 'time-imperative' of the dramatic arts, those that unfold in a sequence of time. Information Theory has shown how one momentary perception builds up an expectation of the next moment, and although this forward movement can be resisted and frustrated for short periods, boredom sets in when there is no overall pattern or narrative. Stravinsky showed with Sacre that the time-imperative could be satisfied by a quick change from tonality, to rhythm, to tune, to orchestration - any driving pattern as long as the force goes forward compulsively.

With his *Rite of Spring* plucking violins in pizzicato, rhythms pick up the stirrings of primitive nature as it grows in springtime. This first section is named by the composer as *Adventure of the Earth*, and the Earth has never been more saturated with sexual energy as it incessantly rebounds into life. The French horns and cellos blow and saw in synchrony with a steady beat—chum... chum... chum... chum... chum... chum... chum... chum... chum... chum... chum...

14. Alan Short's School of Slavonic and East European Studies, London, 2004-6. The background brick architecture of London was mandated, but this contextual architecture was given subtle articulation for ecological and semantic reasons - to create new rhythm of exhaust stacks and double-walled insulation, and to relate to the Slavonic traditions 15,16. Herzog & de Meuron's CaixaForum. Madrid, 2003-08. Preserved brick facade sets the A/b bay rhythms which are taken up as harmonic chords in the top rusted iron addition and set against the vertical garden and void at the base. Reading horizontally gives some basic melodic lines, while reading vertically reveals both harmony and dissonance. **But the large contrasting** blocks of colour and material are like the strong Stravinsky chords, the violent instrumentation of The Rite of Spring







by violent contrasts up and down like a pagan ritual, with screams followed soon by the soft reassuring note of a single flute. The whole *Sacre* is pictorial, which is one reason that West Side Story, many James Bond themes and much movie music has derived from it. For my money *The Rite of Spring* is simply the best abstract *and* figurative, cosmic and traditional music ever composed.

But Stravinsky might have disagreed. He famously wrote, in his 1935 autobiography, a classic version of the abstractionist dream that has been quoted many times: 'I consider that music is, by its very nature, essentially powerless to express anything at all, whether a feeling, an attitude of mind, a psychological mood, a phenomenon of nature, etc ...' In effect, music is essentially just notes, chords and complex sound experienced over time. On a reductive level and for a creative artist in any field, such formalism has a truth and is understandable; but as Stravinsky perfectly well understood (and mentioned), it is not how listeners hear music. Perception is doubly-coded by form and content, and it is why learning and intelligence grow by connections between the two areas.

I emphasise the point of double-coding (common to all semiotic systems) because it challenges Walter Pater's aphorism — the singular unity of form and content he finds best expressed in music — and because many architects still labour under Stravinsky's (and Kandinsky's) hope for abstraction.

Jacques Herzog has said, 'A building is a building. It cannot be read like a book. It doesn't have any credits, subtitles or labels like a picture in a gallery. In that sense, we are absolutely anti-representational. The strength of our buildings is the immediate, visceral impact they have on a visitor.' Visceral impact they do have, but Herzog & de Meuron's buildings are indeed at the same time 'read like a book', and many other things besides including rhythmical music. Consider their CaixaForum in Madrid, a contextual collage of surrounding buildings and an old brick electricity station on the site.

Strong horizontal contrasts divide the collage into three basic voices or four or five melodies (depending on the reading). Rusted cast-iron crowns the top, the middle is brick, and the bottom is a black, voided ground floor, which amounts to a violent Beethoven silence. The basic A/b bay rhythm unifies the volumes and blank windows vertically, and this vertical emphasis is amplified by the volumes at the top. At this restaurant level the building opens up with mashrabiya grills, a recollection of Spain under the Moors, but in musical terms it is a cadenza culminating each chord (and giving a background buzz, what is called a musical 'drone'). Patrick Blanc's Vertical Garden to one side is also stressed with an upwards and diagonal emphasis. But it is Herzog's 'visceral impact' of the large contrasting blocks of colour and material indeed all the primitive themes - that are reminiscent of Stravinsky's violent musical contrasts, at least to me. And like other readings between architecture and music, this will show some themes in common and some differences.

As often pointed out, a scientific analogy between two things is good if it is reduced to one or two qualities of comparison, whereas a cultural analogy can be better for revealing many parallels, as long as the differences are

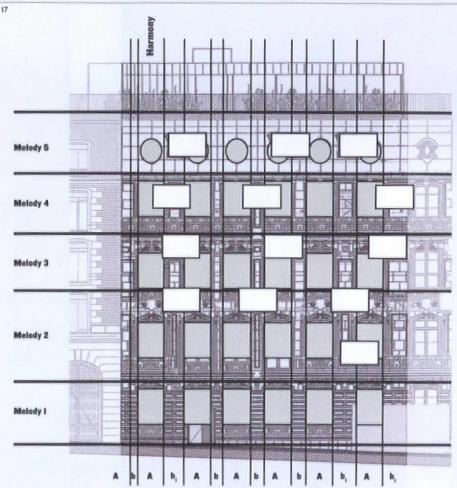
acknowledged. With columnar and window architecture, with buildings that have structural bays and tectonic articulation, the rhythmic parallel to music is narrowly scientific and precise. While it is true relationships change as you move through a building, you can stand still and read the facades of a bay like a musical score, one of the great pleasures of traditional architecture. Even more musical in rhythmic complexity and delight is the Grand Canal in Venice, which can be experienced as one long symphonic transformation of related themes.

Edouard François, at the Hotel Fouquet, Paris, has been forced by building codes to adopt traditional elements, but he has transformed them into new syncopated rhythms. While the conservative arrondissement demanded a Haussmannian architecture of five storeys, the hotel management demanded an eight-storey structure with picture windows for tourists. It sounds impossible, but the contradictions are threaded through each other to erupt in an automatic print-out. The result is contextual counterpoint, at once beautiful, funny and truthful.

What makes it more contrapuntal is that the five superimposed voices are worked through vertically as interesting harmony and dissonance. It is worth studying the analytical diagram to appreciate the skilful syncopation. The horizontal divisions can be seen as five melodic lines, and the vertical bays as harmonic stresses. In medieval and Baroque music, counterpoint is appreciated as the weaving of voices so they first answer each other and then harmonise in a key or cadenza. Also with François's facade the simple bay rhythm of A/b/A/b is emphasised by the superimposed blind windows on three floors, the top oeil de boeuf, and the repeated wall spaces between.

So far so traditional, but then the expected steady beat de-dum, de-dum of melody 1, on the ground floor - is answered by the syncopation of the picture windows on the first floor. These are out of phase with the A/b rhythm, sliding across the b-bay creating a kind of de-dum (ti-slide) or glissando. This is an extraordinary move, and to further emphasise the contradictions required of him, the building is interrupted, amusingly, at the ends. Because the hotel is inserted into a pre-existing context at several points, François starts and ends his rhythms with a half bay (one-half A). This transitional joke is like the architectural 'cut-line' on a drawing. It announces gently 'the Haussmanian wallpaper starts here and ends over there'. It sets the theme for the other interruptions: the picture windows, the fire hydrants, the cash points, the large utilitarian doors and windows of the rusticated ground floor. These functional necessities are

'Music must be experienced in a linear squence, while architecture is taken in three-dimensionally at a glance, or holistically, as Gottfried Semper averred'





17.18. Edouard François. **Hotel Fouquet, Paris,** 2004-6. Most visible is rhythmic syncopation between the mandated repro-style and the modern picture windows. Five melodic voices are in Contextual Counterpoint. like the CaixaForum. This architectural genre starts with the work of Venturi and Stirling in the 1970s, but here in Paris it reaches greater subtlety. Note the shades of grev, black and silver; they add harmonic overtones to what might have been the boredom of prefab repetition

also carried out in tones of silver and grey; and the Haussmannian patterns are continued but now in metal. How droll, the consistency of style with inconstant material. It gives us a new oxymoron 'High-Tech syncopated with Beaux-Arts' – beautifully tooled and consistent as a new form of architectural music.

Are musical chords like space?

The parallels I have been pointing out between music and architecture - rhythm, emotion, meaning and the stereotype of genre - are well known and accepted. One comparison, however, is contentious: the equation between the spatial and time arts. Music has always been known as an art of time, whereas only in the last 150 years has architecture been claimed as the art of space, even more than sculpture. From Sigfried Giedion to Bruno Zevi (by way of Frank Lloyd Wright and Le Corbusier), most critics and architects have insisted on the point. But there is one big mismatch. Music must be experienced in a linear sequence, while architecture is taken in three-dimensionally at a glance, or holistically, as Gottfried Semper averred; and it is even moved through as a series of whole pictures. Architecture does not move in time, even Futurist architecture does not move. This initial divergence between music-time and architecture-space becomes all the greater because they are experienced through wholly dissimilar organs; and also light waves versus sound waves. But consider the counter argument.

All percepts are made one after another. In particular, we read a space or a painting with shifting eyes that move in time. This fact begins to bring the two arts back together, a connection made deeper by the holism of experience itself and the further truth that a time-dependent expectation underlies all dramatic experience.

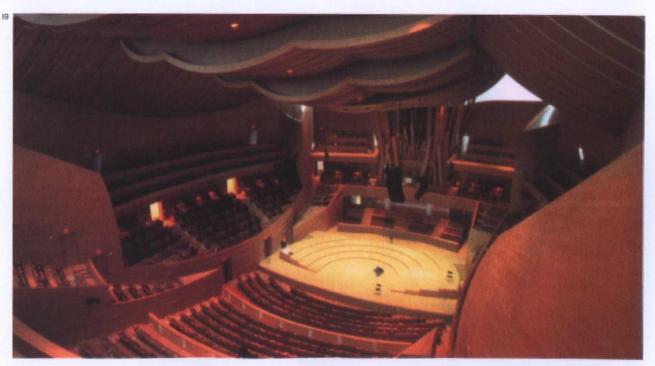
We project the future onto the present, the next phrase or chord onto music, the next room inside a building – all the arts aspire to this condition of drama.

At the neurological level, further parallels exist between time and space experience. Cognitive studies have shown we are a bit like bats, especially when moving in a dark environment with reflective surfaces. When sounds bounce off highly reverberant materials, we can 'see through hearing', especially if we clap our hands, a fact well-known to the blind. As brain-scans have shown recently, music opens up the equivalent three-dimensional world inside our heads, the area of sight. Stereophonic systems exploit this aspect of hearing, as they open up a room to our imaginative projection — a picture of space or the plan of a building; or the structural layout of a symphony.

Polychoral music took advantage of this spatial sense in the Gothic period, for instance at St Mark's Cathedral in Venice where different choirs were placed across from each other. Such opposition works well for placing different instruments that seem to expand the space further in the mind, a counterpoint Frank Gehry and Pierre Boulez have exploited recently, spatial hearing-as-seeing.

The obvious place where these parallel arts meet is the concert hall, and the metaphor 'space as chords of sound' turns into an expressive, petrified music. Since the Expressionists, and then Hans Scharoun's Berlin Philharmonic Hall of 1956, the idea of acoustic generated architecture has become a dominant metaphor. Scharoun designed what he called 'vineyards of people' — and surrounded them with forms which reflected and at the same time dampened the sound. This trope has been adopted by Moneo, Piano and, particularly successfully, by Gehry at his Disney Hall. In this pulsating room, it is as if the listeners were inside a giant, wooden cello vibrating in sync with both the musical chords and the architectural

19. Frank Gehry, Disney
Concert Hall, Los Angeles,
1988-2003. With
rhythmical ranks of
reflective forms in
Douglas Fir surrounding
the 'vineyards of people',
this space is a frozen
image of acoustic curves
billowing and rippling
out from the orchestra



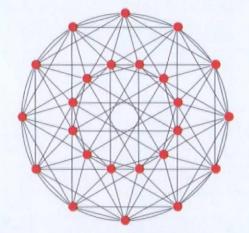
space. Similar curves are used on the outside as well. So the whole building becomes a mixed metaphor of billowing sails and acoustic reflectors, one pulled together by large, rhythmical chunks — like the simple block chords that Beethoven contrasted in his symphonies.

This 'space-music' is overpowering. It has certainly inflated critical metaphors (and mine), but is there anything more than that — that is, a deep connection between harmonic chords and architectural space? I think there is, especially when they are both used in a dramatic way, in a sequence that leads somewhere.

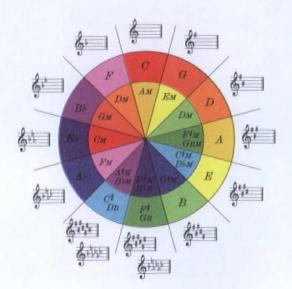
Take the typical passage through an Egyptian temple complex. This is a natural drama of discovery as elements become smaller, darker and more meaningful; or the supreme architectural experience I have already mentioned, the journey up the Acropolis to the Parthenon. Both are examples of the 'architectural promenade' that Le Corbusier made the hallmark of his work. One musical equivalent of this promenade is, for instance, a song in the key of C which is repeated, then transformed, then moved away from the base key in order to finally return. Musicians use an architectural metaphor to describe this journey - 'the tune has a sense of going home'. A typical symphony will drive an organisational idea or leading chord to its culmination, and composers refer to this overall time-structure as its 'architecture.' So the parallels work both ways.

To emphasise how powerful the movement of chords can be, Howard Goodall adopts a kind of metaphorical overkill. He speaks of how, during Newton's time, musicians conceived the law of harmonic progression as having a sense of 'gravity'. One chord is attracted or repulsed by another, as if 'magnetised'. The power of chords increases visually as triads 'meld together like good colour combinations'. So strong is the impulsion forward, it becomes passionate: 'the triad of G yearns to move to the chord lying a fifth below it, C. Adding a seventh to C will make it yearn to move to F, and so on' (p91, my emphasis). In effect, the right sequence of chords is an adolescent driven by hormones. Taste is inevitably changed by this force. Newly attractive 'chains of chords' are discovered by Vivaldi and then dominate a period, or with Purcell, a country. So our hearing is affected and structured by learning the sequences, until they are finally consumed by fashion and then become predictable and finally boring. But they still relate to natural harmony, not far from the Pythagorean ratios that begin the story.

Conveniently for my argument, these 'laws' of harmonic progression, or The Circle of Fifths as it is usually known today, has a vivid architectural and chromatic structure. Such analogies, 'the harmony of the heavenly spheres' (and 'the music of the colour charts') are quite complex and worth exploring at greater length, by a musician, painter and scientist. Some believe, as Pythagoras thought in the sixth century BC, they extend into current cosmology, even Superstrings where some explanatory diagrams look like Mersenne's.

But here it is the simpler comparison that is at stake, the way composers and architects both use their 'magnetic force of forms' to create drama. If spatial progression is equivalent to the harmonic progression through chords, 

20. Diagrams showing the Circle of Fifths, taken from The Architecture and Colour of Music. The major 12 keys start with C at the top (and progress or regress five piano keys), while the minor scale is on the inner circle, and some harmonic overtones apparent in the ratios. The Mersenne Star (top) was drawn in 1648, but the more regular harmonic relationships were only fine-tuned geometrically (or 'tempered') by JS Bach later, in the early 1700s. Note the mixing of colours, a chromatic scale, yet another metaphor like the geometric one 21, 22. Le Corbusier, La Tourette, France, 1953-61. Pure volumes in proportion to each other and dissonant; regular harmonies and rhythms set against atonal and serial window verticals designed by Xenakis; Classical squares, cubes, pyramids juxtaposed with discordant slashes and diagonals



'One musical equivalent of the architectural promenade is a song in the key of C which is repeated, then transformed, then moved away from the base key in order to finally return'

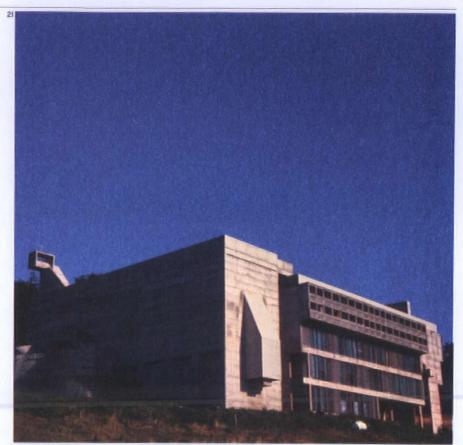
it leads to the idea that architecture might be in certain keys, or have a tonal centre, or underlying proportions. This idea certainly occurred to Le Corbusier (whose brother was a musician) and in well-known lines repeated throughout the 20th century he extols the virtues of harmonic proportions and 'architecture as the masterly, correct and magnificent play of volumes in sunlight'. That is, a tonal architecture of pure forms in proportion to each other. In the chapter of Towards a New Architecture called, aptly, 'Architecture, Pure Creation of the Mind', he repeats the Pythagorean assumption that we are tuning-forks, and ones well-tempered to proportions that are beautiful. These ratios are the ones 'we feel to be harmonious (his emphasis) because they arouse, deep within us and beyond our sense, a resonance, a sort of sounding-board which begins to vibrate ... (187) ... the axis which lies in man, and so with the laws of the universe ... (196)'

In effect for him it is feeling not reason that is the judge of harmonious forms, as we experience the architectural promenade in space-time. One of Le Corbusier's most dramatic sequences is at the monastery of La Tourette which teeters on the side of a hill. Here the route takes us on both a classical and modern journey through formal tonalities and atonalities. Designed with Iannis Xenakis, the mathematician and 12-tone musician, it has pure forms seen in opposition, and visual chords that are both proportional and dissonant. On the upper side of the hill, the monks' cells over the entry create the simple and strong rhythms - solid/void, A/B - a classical rhythm that extends into the proportions of the parts, and this then holds the 'cornice line' around the site. But the descending volumes, and undercroft of the complex, take on entirely different character, a surprising curved, Gaudiesque tilt against the hill.

Xenakis, the atonal composer, was in charge of setting the rhythm of the lower windows, the 'ondulatoires', the glass and concrete verticals that buzz away tightly; then open up, like one of his serial compositions. These walkways are in brilliant counterpoint to the heavy cells above, with their remorseless dark beat.

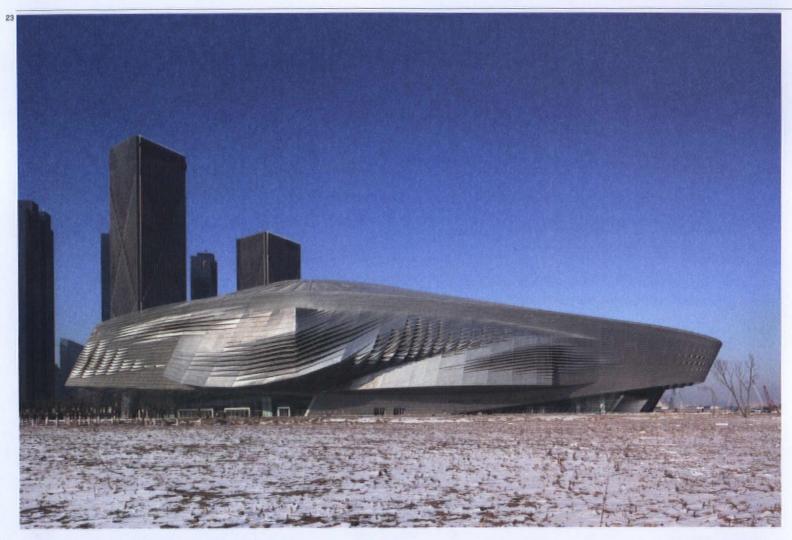
But it is the culmination of the route which brings these themes to a climax. Here the buildings split apart, volumes move against each other in violent opposition, a concrete chimney smashes up to one side of a horizontal theme, a bridge jumps over the cornice, a blank wall stops the whole composition — and zoom — the eye leaps through the leftover void to the horizon beyond, a clear return to the cosmic view of architecture (and music).

In one sense, this architectural promenade summarises the debate between traditional tonal architecture and





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atonal Modernism, to the benefit of both. Xenakis, a risk-taking composer and good architect who built the Philips Pavilion for Le Corbusier, did not achieve popularity as a musician, the plight of other atonal Modernists such as Schoenberg and Webern. The reason often given is that, during an extended serial performance, very few have the concentration to perceive the underlying architecture. This may be true, but as La Tourette demonstrates, it is not the lack of tonality per se that is the problem; or the dissonance, or any particular Modernist form or theme. Rather, I believe, it is the lack of local momentum, the way randomness destroys the all-important 'time-imperative'. During any performance there must be chaotic moments, and boring ones to relax the mind and allow forgetfulness. But their duration has a limit - shorter than John Cage's four minutes and 33 seconds of silence - before the listener gives up. Some expectations must be created, whether by rhythm, tonality, themes, melody, or anything (including gesture and silence) for the mind and body to anticipate the next moment, the near future.

In this sense, the epigram of Walter Pater is turned on its head: 'music constantly aspires to the condition of architecture. The art of building has an easier time of showing its drama, because it can be inferred as a whole in a single glance. Viewers are more in control of perception than listeners at a concert, especially those hearing random, serial music who have no idea where they are going. The two arts may be equally abstract, equally modern and discordant; but the spatial ones allow a perceiver's participation and control in a way the time arts do not.

Consider a recent example of the iconic architecture now being built in Brazil, India, Russia, and on the Oil Route to China: Wolf Prix's latest essay in a cloud-like, singing metal. The grey forms are not much like anything seen before, except perhaps a whale. One can infer window-lighting where the gills and fins push out, and the pregnant bulge signals a huge public space, and maybe the theatre and opera house inside; and, unusual for a total abstraction, one can see where to enter: the front door is in front.

Like so many swooping constructions of Zaha Hadid and so much digital architecture in general, much of the surface is seamless and without cues as to up and down, base and top, gravity and flying. Thankfully, many fractal forms for lighting divide up the skin and give that scaling

23, 24. Coop Himmelb(I) au, Dalian Conference Centre, China, 2008-12. A continuously changing surface that rises and falls and bulges in the middle to include a theatre and opera house. Organised like block chords of music that open up and close, it is reminiscent of both Wagnerian chromaticism and the tonal melding of Philip Glass and John Adams



'The two arts, building and music, may be equally abstract, equally modern and discordant; but the spatial ones allow participation and control in a way the time arts do not'

so necessary for architecture. The interior shows the same mixture of fractals and continuous curves, except now in different white harmonies. As visual music one can compare it to the swooping chords that Wagner used, and those of '70s composers such as Philip Glass and John Adams. There is tonality but it is always melding, there are rhythms but they are always morphing.

Unlike the other buildings here I cannot say if it works well, because I have not seen it. But that it works dramatically to sustain interest, as it continuously rises and falls and erupts, I have no doubt. It again proves the point that architecture can aspire to the condition of

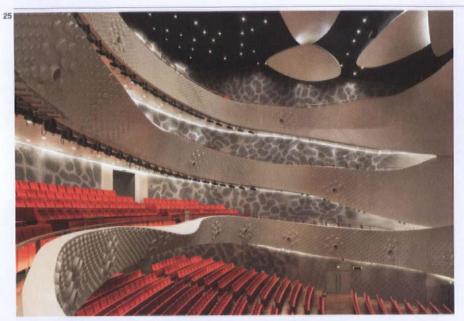
music because it too can be almost entirely abstract. But, when it gets rid of the usual distinctions between ground, wall, window and roof — as Blobmeisters have been attempting for 30 years; when it subtracts the usual cues of drama, then it reminds us of the time-imperative that cannot be escaped. It must reintroduce powerful new forces to set up new expectations. Otherwise, it will be too disorienting to hold our interest. Whatever else this 'whale' of a building does, as it cuts old anticipations it sets up strong new ones, and becomes a different type of music.

Pleasure of anticipation

The idea of such a time-imperative may be unexpected and alarming. But it is based on the truth that the body is as much a futurist as the mind. We project forward the next hour, minute and second to anticipate the flow of information, and that can be a matter of life or death. In sports it is well known that our body anticipates the pitch of a baseball, the slap of a hockey puck, the serve of a tennis ball much faster than we can think about it, and the reaction is often most skilful when most brainless (or on auto-pilot). It is often said that if you ask a centipede in which order it moves its hundred legs it freezes.

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25. At the heart of the Dalian Conference Centre is a traditional horseshoe shaped auditorium with a capacity of 1,600 seats. The classic auditorium is reinterpreted for the modern era, with riotous decor and acoustically pimpled surfaces. Here there is tonality, but it is always melding; there are rhythms, but they are always morphing

Quick automatic anticipation of the next microsecond is essential for walking and survival.

But of course the arts and sciences depend on thinking and feeling which have a much longer time-horizon, thousands of years, where expectations are built up in the complex web of interconnected culture. That is why it is impossible to fully appreciate either Gothic architecture or Relativity Theory, without knowing something about the codes and stereotypes that lie behind these cultural forms. And that idea is alarming for an age which believes everything is transparent, or can be quickly understood, or will become more so with all-glass architecture (the fantasy of the Expressionists and so much 'democratic architecture' today).

The implications of the time-imperative differ between the spatial-arts and time-arts, as I have mentioned, although all perception is in space-time. To reiterate, music is less perceiver-controlled than architecture because it cannot be inferred in a glance, and has to be experienced over a longer time frame before you guess how it will play out. Maybe, as with a conversation you are following, the inferences carry over about 20 seconds. The ability to follow a musical theme, or a verbal argument varies, but I remember when Information Theory and neural processing were first discussed together in the 1950s that general limits were set. The psychologist George A Miller published a famous paper called 'The Magic Number Seven, Plus or Minus Two'. This became a formula for thinking about thinking: that you could process seven plus or minus two bits (or chunks or objects) in your short-term, or working, memory. While no universal measure of this processing is accepted, the idea of such limits is commonplace.

For listening to music this attention span of 'now' (that is, the flow of music as perceived and anticipated in the short-term memory) will vary as one becomes excited and then bored. Forgetting bits of a composition is necessary for being elated when they later come back, as one's

auto-pilot perceives in its special thrill of recognition. The same is true in the architectural promenade, when one finally reaches the anticipated climax of seeing the Parthenon up close, and then is released into the cosmic view. But, whereas one can guess much of the whole promenade from the first view, the same is not true with the time-arts. These are more tyrannical — only their author knows the plot beforehand — and therefore music must continuously enforce new expectations, immediate goals, all the more strongly. I think Stravinsky's Sacre du Printemps proves the rule.

All perception has an element of goal-direction, as we project forward the next instant. Aristotle claimed that 'Man is a goal-seeking animal. His life only has meaning if he is reaching out and striving for goals.' This has its parallel in the arts which, as they unfold, generate their own goal. The time-imperative means that if our attention is not grabbed every now and then by both pattern recognition and the expectation of the new, we will not be engaged.

Putting together these thoughts, and the analogy between music and architecture, leads to further conclusions. The basic means in common between the two arts consist in rhythm, harmony, emotional intensity, meaning, the reliance on stereotype (or genre) and the progression of chords (or the comparison to an architectural journey through space). Many other details and figures are shared, such as chromaticism and glissandi, the use of overtones and morphing. Architectural and musical ornament can sometimes be more important than structure, and boredom and background are necessary for both arts.

But music is not for the most part background (except in shopping centres and muzak) and has no exact equivalent for the foreground flip of architecture into background urbanism. Music, as a time-art, is also much more controlling and authorial, and not meant to be experienced backwards or shift in speed with the perceiver. Countless more differences separate these two arts — utility and cost — but they are both routinely perceived as abstract arts, where form and content are one. This perception may be false from a semiotic viewpoint, because we know all communication is doubly-coded, but the experience of this illusion is no less convincing for that.

NOTES ON SOURCES

Rudolf Wittkower, Architectural Principles in the Age of Humanism, (1949, 1988) is still the standard look at the Renaissance use of Pythagorean harmonies in architecture.

I have also made much use of EH Gombrich, The Sense of Order, A Study in the Psychology of Decorative Art (1979) and its last chapter 'Some Musical Analogies'. It is as dense and rich as a late Beethoven quartet and for architects interested in ornament repays reading with a pen in hand. Howard Goodall, The Story of Music (2013 and BBC programmes) is a most informative overview with as many provocative insights as one can find in a history of music. Le Corbusier's view of the human as a superior tuning-fork is in Towards a New Architecture, 1927 (translated by Frederick Etchells), pp. 187, 196.

Geraint Franklin has provided some helpful comments, and I have been helped in the diagrams here by Megan Burke. Some of these historical sources can be found on Google Images.



REVIEWS

Academic painter

NIALL HOBHOUSE

Massimo Scolari: The Representation of Architecture, Skira, Milan, £42

As the great tide of Modernism receded in the late 1960s and '70s there was discovered, wandering among the debris on the shore, a mutant generation of architect-seers. They were to make their reputations (and careers, indeed) in architecture by the energy with which they resisted actually building anything very much.

The list could be a long one, and always disparate. Among the architects who did fundamentally change the idea of architecture – by preaching where they (often aggressively) refused to practise – are Aldo Rossi, Colin Rowe, John Hejduk, Cedric Price and Manfredo Tafuri. It was left to the luckier

inheritors of this territory — Eisenman, Prix and Koolhaas among them — to discover that the market would allow real buildings to be made out of a strong theoretical antipathy to built form.

The question is where to place Massimo Scolari in this short history of the central architectural discourse of the period? For a start, if the history told above is not so much glib as wrong, then the fat new volume of his own miscellaneous writings, and of appreciations by his friends, seems frankly superfluous. We can hope that the immense body of watercolours, each obscurely titled and dense with abstract meaning, may yet have some cultish afterlife; they could at least be by nobody else.

But the book makes a larger claim, of the artist-architect as an agent in a history-that-really-matters. It carefully fosters an image of Scolari as the last true voice of the unhappy band of non-builders: stern, rigorous, incorruptible by

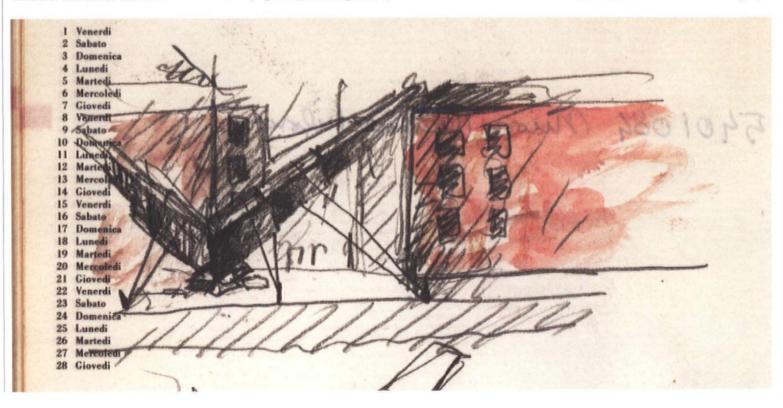


Above: a model based on one of Scolari's typically esoteric watercolours, shown below

the market. Again and again, this is presented as the only possible position for the architect in an age where active practice is impossible. And yet — and this might be the crux — there seems to be no consensus in what is said here about either the meanings to be attached to individual works, or about the nature of Scolari's critique of the profession or of its intellectual problems. We understand just that he is aufully critical.

The impression is that the watercolours are something onto which the commentator can at will project any personal polemic position. So Leon Krier understands him as protesting against a time in which it is impossible to build, and Peter Eisenman as engaged in an enquiry into the stability of geometric forms.

It is hard to see how both could be right – it is more as though each had gratefully left his theoretical conscience in Scolari's safe-keeping



while they engaged with the world in more practical ways.

Other observers read the architecture as incidental to the existential questions raised in the paintings; some interpret what they understand as a tragic appreciation of the failure of the Modernist project as a nostalgia for Classical forms; others again deny all nostalgias.

Most define Scolari by listing what he is not but might-be-confused-with being. Scolari himself seems at times comfortable with having casually assumed Aldo Rossi's cloak, and then anxious to put distance between himself and the Master.

Rossi is, of course, the inescapable point of comparison — but if Scolari is indeed covering the same ground, then his imagery is very much less plangent; if the enquiry is different, or has moved on, then in which direction? Nobody quite says what seems after all the most likely, that Scolari's work in watercolour is very

Below: the project was realised at the 1991 Venice Biennale as a sculpture, Wings precisely, even exclusively, selfreferential. Or that it comes servedup without irony; so that the more 'finished' the sheet, the more impenetrable its meaning.

The most useful clue comes in a strange unsigned document at the end of the book. It may be by the architect himself - although we have to hope it is not - and it takes the form of an extended curriculum vitae, complete with photographs of him in the best company and the record of his achievements as skier, fencing champion and aviator. An astonishing, masonic roll-call of friends and teaching engagements reassures us that from about 1968 he was just about everywhere, and 'frequented' (an odd usage) just about everybody. Plenty of nostalgia here, of its kind.

Perhaps then the best way of understanding the watercolours is as his way of getting us all to go on guessing; Massimo Scolari, international architect of mystery.

Gray matters

ANDREW AYERS

Eileen Gray, Centre Pompidou, Paris, until 20 May

Eileen Gray last hit the headlines in 2009 when the Yves Saint Laurent/ Pierre Bergé collection went under the hammer: her Satellite hanging lamp (c1925) fetched €2.9 million, an Enfilade lacquered sideboard (c1915-17) fetched €3.5 million, while her Dragons armchair (c1917-19) went for a staggering €21.9 million, making it the second most expensive piece of furniture ever sold at auction. One of the reasons for these astronomical sums must surely be the rarity of her pieces (which were either unique or made in very limited numbers), which no doubt also helps to explain the obscurity into which she fell after the Second World War, and which has afflicted her to a





certain extent ever since. For it is only now that the country in which she lived for over seven decades is finally honouring her with a retrospective, 37 years after her death. In architectural circles she is essentially known for her first building, the Villa E.1027 at Roquebrune-Cap-Martin (see also Overview p14), which she co-designed and built with the Romanian architect Jean Badovici in 1926-29. But architecture was a discipline to which she turned late in life (at the age of 48) after a successful career as a designer, and although she planned many other buildings, her architectural oeuvre remains generally unknown.

Born into a wealthy aristocratic family in Ireland, Gray enrolled at the age of 22 at the Slade School of Fine Art, where she studied painting. It was during this period that she first learnt lacquer work - on her own initiative, outside school hours - an art of which she would become a master in Paris, where she moved in 1902. Although painting finally gave way to the decorative arts around 1907/08, she never stopped producing images, and one of the merits of the Centre Pompidou exhibition is the section devoted to this little-known aspect of her production. In 1910 she opened both lacquer and weaving workshops, and in 1913 exhibited for the first time at

the Salon des Artistes Décorateurs. After a short hiatus during the First World War, she resumed her career as a furniture maker and also became an interior designer, decorating the apartment of the milliner Mme Mathieu Levy (aka J Suzanne Talbot) in 1919. From 1922 to 1930 she ran a Parisian gallery, mysteriously named Jean Désert, where she sold her furniture and objects, and continued to exhibit. E.1027 was followed by Tempe à Pailla (1931-35), a house she designed alone for her own use. Her career seems to have come to a halt just before the Second World War; aged 67 when the conflict ended, she would spend the rest of her long life in semi-retirement, although the creative urge never left her, and it was in the post-war period that she produced many of her building designs. Her third and final architectural realisation was the renovation of an old stone building (Lou Pérou, 1954-61), which was her summer residence until her death.

Organised chronologically and thematically, the Centre Pompidou exhibition aims to retrace her output as a continuous, if somewhat heterogeneous, whole, rather than splitting her production in two (decorative arts/architecture) as has sometimes been the tendency in the past. It opens with her lacquer objects and furniture, followed by the fittings and furniture she sold at

Above: the living room of E.1027 doubled as a boudoir, the sofa pulling out to become a bed. On the left is Gray's Bibendum chair, inspired by the Michelin Man Below: her lacquered Dragons armchair represents an exotic earlier phase of her work, with its roots in the Aesthetic Movement of the fin de siècle. She would later decry these pieces as 'theatrical'



Jean Désert, her interiors (including exhibited ensembles and the apartment she realised for Badovici), E.1027, Tempe à Pailla, Lou Pérou, her architectural portfolio carefully compiled between 1956 and 1975 - and finally her collages. paintings and photographs. As the exhibition's commissaire, Cloé Pitiot, points out in the elegant catalogue (have a magnifying glass handy for the tiny images), three quarters of Gray's production is currently in non-institutional hands, so hats off to the Centre Pompidou for gathering together so many privately-owned pieces (minus the YSL ones, which must have been a relief to the insurers).

The principal display strategy is what the curators quaintly refer to as 'period rooms', in fact a collage technique whereby giant blow-ups of period photographs of her interiors (none of which survives) provide the backdrop to related furniture and objects, emphasising her work as a true ensemblier, a total-environment designer. Interpretation is sparing, and the show gives no clue as to what prompted Gray's switch from luxury 'Art Deco' production to highly avant-garde pieces in tubular steel, although in this she was like other designers of the time inspired by the new idiom, most notably Pierre Chareau. She also shares with Chareau an intimate, interior approach, which Caroline Constant, in an article on Gray, has described as 'non-heroic Modernism'.

Commenting on Chareau's Maison de Verre, its curator Mary Johnson has said that in opposition to the buildings of Le Corbusier and co, 'rather than a manifesto for a way of life proposed from without, it is an embodied exploration of the art of living as discovered from within', which exactly summarises Gray's subtle emphasis on the materialisation of manners and morals. (As Olivier Cinqualbre points out in the catalogue, Gray and Chareau's career trajectories also share strikingly similar traits.) While Gray's three completed building projects are given extensive space in the exhibition, her architectural portfolio is reduced to a slideshow, which makes analysis of it almost impossible for visitors.

The obscurity surrounding Eileen Gray is in large part her own doing: tastefully, aristocratically discreet, she destroyed much of her correspondence and carefully

stage-managed the archives she did leave behind. Ironically (impishly?), this has left the field wide open for all sorts of speculations and interpretations around the themes of feminism, sapphism, gender studies, and did-she-or-didn't-she (with Badovici, with the singer Damia, to name just two). Scholars have even wondered whether it was in fact she who designed Badovici's house in Vézelay. Her reserve comes across fully in her work, with its many screens, shutters and other veiling devices. The elegant, sparingly mounted exhibition at the Centre Pompidou tackles none of these issues head on, alluding to them only obliquely in a manner Gray would surely have condoned. After seeing the show, you certainly feel more familiar with her work and career, but the mystery behind them remains as tantalising as ever.

Under the sheltering sky

LINDSAY BREMNER

From Camp to City: Refugee Camps of the Western Sahara, Manuel Herz, Lars Müller, ETH Studio Basel, £45

Manuel Herz's magnificent From Camp to City: Refugee Camps of the Western Sahara is the result of an extensive study of the six refugee camps of the Western Sahara in south-west Algeria. The Western Sahara is one of the few occupied, non-self-governing countries in the world. Traditionally, it was an area populated by Sahrawi, a nomadic people related to Berber culture. It was colonised by Spain in the 19th century and, after deposits of phosphates were discovered in the mid 20th century, exploitation and urbanisation began. In 1975, Spain started to withdraw from the colony, only to be replaced by force by Morocco, which still occupies the territory. The Sahrawi were forced to flee into south-west Algeria and settled by UNHCR in camps near the town of Tindouf.

The central thesis of the book is that these refugee camps, if viewed from the lives of their inhabitants, are proto-cities. 'One aim of this research is to shift the vocabulary used in the framework of refugee camps from one which revolves around technicalities towards one that understands these settlements as environments having some, or many, urban qualities.'

Herz pushes against the three predominant conceptions of refugee camps: that they are humanitarian spaces in which lives are saved, or spaces of control where refugees' lives can be administered and supervised by other institutions, or places of destitution and misery (usually at the same time). While these might be true, they are formed from an outside, mostly Western, perspective. They are not about how refugees understand their own environment or live in it. Using the tools and vocabulary of an urbanist. Herz moves beyond these paradigms of humanitarianism, control and misery to understand the camps as proto-urban spaces of responsibility and freedom.

During the winter and spring of 2011, he and his team of staff and students from the ETH Studio Basel set out to understand and document how the refugee camps of the Western Sahara were used and shaped by refugees themselves. The research was driven by urban questions: how do people live in the camps? What kind of work do they do? What kind of recreational activities do they pursue? How do they move about? How are the camps produced by the agency of those who live in them? They found neighbourhoods, markets, local styles, culture and the materialisation of difference. The camps served as 'urban transformers' for their residents, enabling them to make the shift from nomadic, tribal traditions to quasi-urban ones. They were motors of urbanisation, preparing the refugees for urban lives after the camps. In them, the Sahrawi developed institutions that

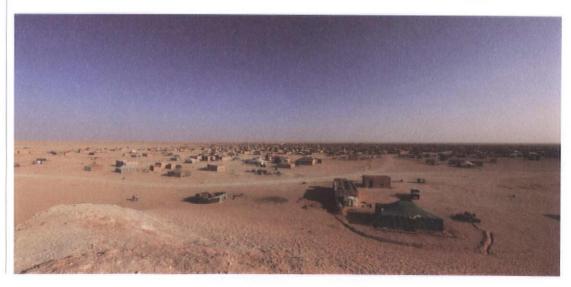


Above: a barber shop in Camp El Aaiún – does the establishment of familiar businesses housed in solid structures transform the camp into a permanent city? Below: Camp Smara. 'Tents are not merely used for their utilitarian purposes, but to visibly proclaim a demand to return to the homeland'

could be transferred to their own country once the conflict was over. From the lens of their inhabitants, the camps were quasicities, expressions of urbanity, ready to be taken elsewhere at any moment.

The book is filled with extraordinary crisp, clear maps and photographs that convey this urban condition. They are divided into topics: planning and living, commerce, work, health, education, moving, recreation, leisure and administration. A very real sense of a sparse, fragile, urbanity, inserted between the vastness of the desert sand and the vastness of the desert sky, emerges. This is preceded by a photographic and narrative history of refugees and refugee camps more generally, and the governance of refugees by the League of Nations' Commission for Refugees from 1921 and the United Nations UNHCR from 1950.

Herz is careful to point out that his study, instead of going from the general to the specific, works from the specific to the general. By paying careful attention to the particular, an alternative reading emerged within the dominant discourse on camps. This goes a long way, I think, to moving us from seeing refugee camps through the lens of Giorgio Agamben's 'camp' to seeing them through the lens of Foucault's 'heterotopia', as taken up by Kevin Hetherington in The Badlands of Modernity: Heterotopia and Social Ordering (1997): 'Heterotopia [are] spaces of alternate ordering. Heterotopia organise a bit of the social world in a way different to that that surrounds them. That alternate ordering marks them out as other and allows them to be seen



as an example of an alternate way of doing things.'

Heterotopia are not outside society, but sites of social experimentation and transformation. Hetherington locates them within a broader Modernist project wherein alternative modes of control and modes of freedom are imagined and implemented. Instead of functioning as states of exception, they are cutting edge arenas where 'modernity's control-freedom dialectic is played out' (to quote Philip Steinberg's The Social Construction of the Ocean of 2001). In refugee camps, this dialectic lies in the tension between the spaces of control designed, laid out and administered by international aid agencies ('other' spaces) and the practices of everyday life of their residents ('regular' spaces). Through this, a distinct heterotopia, an alternative ordering of space emerges. It is unstable and can be abandoned at any moment should conditions change. Part of this construction is a utopian ideal that may be seized upon by actors wishing to make it a site of social emancipation. In the Western Saharan camps, this heterotopic project has been put to use by residents to transform their tribalbased traditions into a quasi-urban, emancipated society. Herz describes them as 'proto-cities' in which the Sahrawi state is 'prefigured'.

Clique within a clique

JESSICA KELLY

The Independent Group: Parallel of Art and Life Institute of Contemporary Art, London, until 9 June

The men who set up the Institute of Contemporary Art (ICA) after the war - one of whom was JM Richards, a former editor of this magazine - intended it to be a meeting place for a specific clique of people. They wanted to create a space where 'modern' artists, architects, writers and musicians could congregate and discuss issues concerning contemporary culture. This history of the ICA as a home for various generations of cultural cliques is a theme in the current Parallel of Art and Life: The Independent Group exhibition. The members of The Independent Group - Richard

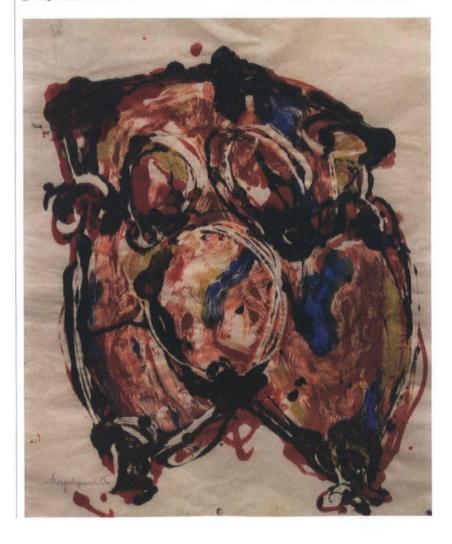
Below: Magda Cordell's painting Untitled (Woman) of 1955 evinces a debt to Jean Dubuffet, whose art brut was admired by The Independent Group. Cordell was born in Hungary, fled to Britain during the war, and ended up teaching sociology at the architecture school of Buffalo University, New York

Hamilton, Nigel Henderson, John McHale, Eduardo Paolozzi, William Turnbull, Magda Cordell, Peter and Alison Smithson, Lawrence Alloway, Reyner Banham, Toni del Renzio and Frank Cordell – met at the ICA.

Lawrence Alloway suggested that The Independent Group members had little more in common than their dislike of the 'establishment attitudes' of the ICA founders. However, between 1952 and 1955 they used the Institute as the site for informal discussions and later, a more organised series of seminars and several exhibitions — thus fulfilling the aims of the founding members. For this reason it's perhaps more useful to think of them less as an 'Independent' group than as a clique within a clique.

Most histories of The Independent Group neglect the different interests and activities of the individual members, focusing instead on single issues, particularly the birth of Pop Art. This narrative of the group as the 'fathers of Pop Art' simplifies the otherwise complicated history of the group's activities. It also overlooks

the role of the women in the group. A painting by Magda Cordell is included in this current exhibition to emphasise the too-often ignored role of the wives of the 'fathers of pop'. The curators of the exhibition offer a view of The Independent Group beyond the mythology of Pop Art. Among the original art work and archival material in the exhibition there are hints at the members' mutual interest in popular culture science fiction comics, books about Hollywood movies and a collage of magazine photographs in John McHale's Telemath painting but there is an emphasis on the differences between the members. This idea of finding unity among difference was the theme of the original Parallel of Life and Art exhibition in 1953 (the catalogue of which is in the exhibition), organised by Peter and Alison Smithson, Nigel Henderson and Eduardo Paolozzi. The exhibition focused on the aesthetic links between conventionally unrelated objects skyscrapers and vegetable cellular tissue, Machu Picchu and a Dublin



bus garage, for example. Like the assembled photographs in Parallel of Life and Art, the members of The Independent Group are separate individuals who created links between themselves, specifically to differentiate themselves from the conventions of the previous generation. By returning to the idea of The Independent Group as a collection of differences, the current exhibition moves away from the myths that surround the group and considers their pragmatic and self-conscious identity as a new cultural clique.

Energy: zero impact

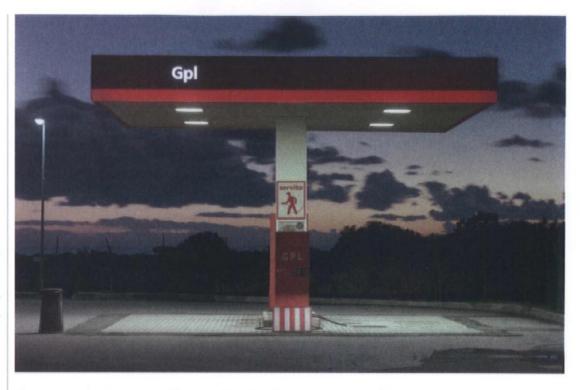
ZAIRA MAGLIOZZI

ENERGY: Oil and Post-oil Architecture and Grids, Gallery 1 and Architecture Archive Centre, Maxxi National Museum of XXI-Century Arts, Rome, until 29 September

More than three years since the Maxxi opened in its new Zaha Hadid building, current exhibition *Energy:* Oil and Post-oil Architecture and Grids is only the second to be entirely conceived and curated by the museum's curatorial staff (rather than imported from elsewhere). There were high expectations for this exhibition to be the standard-bearer of the Maxxi's cultural approach.

Curated by Pippo Ciorra, the show examines the impact of energy on architecture and on the landscape; on the past (Italy's heritage) and the future (of architecture). From the oil boom to renewable energy, there are three sections: Stories (recounting the past), Frames (investigating the present) and Visions (exploring diverse hypotheses for the future).

Stories, curated by Margherita Guccione and Esmeralda Valente, is the most Italian section. Apart from some rare exceptions, it is hard to find masterpieces or cutting-edge architecture here. There is a focus on postwar Italy, with 80 historic drawings and projects of road and motorway architecture, most of them from the archives of Eni SpA, the largest Italian oil and gas company and also the main partner of the exhibition. The result is confused and the presentation of the selected projects unexciting. This section hobbles the show, preventing it from crossing Italian borders.



Above: photographs of Italy's energy infrastructure by Alessandro Cimmino are some of the most striking components of the exhibition The second section Frames is curated by Francesca Fabiani. It seems detached from the rest of the show, unfairly relegated to a tiny corner at the end of the exhibition. Here, the remarkable pictures of Italian photographers Paolo Pellegrin, Alessandro Cimmino and Paola Di Bello capture the impact of the oil industry on the Italian landscape. These images get to the essence of the architecture and its context better than any words could.

The core of the exhibition is Visions, both in terms of scale and the curator's intentions. Seven architectural firms were invited to make proposals for the third millennium's energy distribution, illustrated by site-specific installations. Among them, Guillermo Acuña Arquitectos Asociados (Chile) presents an installation reflecting 'virtual interaction' with the energy of Santiago de Chile; Lifethings (South Korea) envisages a refuelling clinic; MODUS (Italy) depicts a futuristic motorway to supply energy along its length; Noero Architects (South Africa) works on a fishing village that generates its own energy; OBR Open Building Research (Italy) exhibits an interactive installation with energy coming from pedalling; Sou Fujimoto (Japan) has conceived a service station as a forest and TERROIR (Australia/Denmark) combines local identity and advanced technology to create sustainable energy.

The responses are as varied as they are distant from the curator's brief, leading to some pleasingly unexpected interpretations. But asking an architect to create a site-specific work depicting his or her vision of a future energy distribution station, although clever, has its shortcomings. On the one hand, it has the merit of overcoming the long-standing dichotomy between architecture and the way it is displayed. On the other hand, the approach seems reductive, because such a wide-ranging topic as energy cannot be considered through one specific object. Visions demonstrates exactly this: the impossibility of thinking about a single element when it is not part of a more complex system. So most of the proposals are disconnected from the central theme, and weakly outlined instead of being deeply analysed and clearly proposed to the viewer.

On balance, the work featured is valuable but at the same time parochial. Even if the seven architectural firms of *Visions* are from all over the world, two of them are Italians, and those are not exactly pivotal. There is too much local work for the show to have much international relevence, or for it to make a decisive step forward in the contemporary debate. Sadly, it also fails the institution: this is no clarion call announcing the Maxxi's arrival on the global stage as a truly world-class museum.

PEDAGOGY

Politecnico di Milano, Italy

MATTHEW BARAC

With 1,400 lecturers, well over 1,000 administrative staff, and a student population fast approaching 40,000, the word 'university' feels insufficient to describe the Politecnico di Milano, an institution that is not only the main educator of architects in Italy - more than 20 per cent of those on the national register graduated from here - but also ranks among the largest schools of architecture in the world. Founded in 1863 as an advanced technical institute for engineering, the Politecnico began teaching architecture two years later. In the 1990s, capitalising on Milan's status as a global design hub, an industrial design programme was added; this

soon expanded to form a faculty of design, offering courses including interiors, graphics and fashion.

Few alumni roll-calls are as illustrious: Giuseppe Terragni, Achille Castiglioni, Giò Ponti, Aldo Rossi, Vittorio Gregotti, Carlo Aymonino, Giorgio Grassi, Renzo Piano - the younger among them colleagues or students of Ernesto Rogers, who took up a post at the Politecnico in 1962. Rogers exerted a powerful influence over mid-century debate, not only as a teacher but through editorial roles at Quadrante, Domus and Casabella, periodicals which underpinned the emergence of a polemic connecting the strict lines of Italian Rationalism with Tendenza efforts to reconcile with history.

Among the inheritors of this critical discourse is Cino Zucchi, Chair Professor of Architectural and Urban Design at the school. Having completed his studies at the 1. Photomontage by recent graduate Mattia Cipriani showing his Milan-based contemporary art museum as a jagged formation of buildings with shady alleys slotted between 2. Stark, imposing planes of béton brut act as backdron to external exhibition spaces for sculptures and installations 3. The narrow, winding promenade within a tight urban context recalls the archaeological remains of **Mura Spagnole fortifications**

Politecnico in the late 1970s, Zucchi - and many of his peers - carry the weight of the Rogers legacy. But current students, who have a different relationship with technology, appear comparatively unencumbered by tradition: 'this generation, born with the computer, has left behind any transition-phase embarrassment. The best of them are totally aware of the global dimension'. Globalisation has brought diversity and diversification; an increase in foreign students and 'a relative explosion of teaching styles that cannot be led back to the weakened, but still present, humanistic Italian tradition'.

Convened with colleagues
Beatrice Borasi and Silvia Beretta,
and supported by a team of design
tutors, Zucchi's studio addresses the
contemporary crisis of urban identity
which is problematised, in studio
briefing documents, as 'the conscience
of the city'. Architecture's autonomy







a concept inherited from the
 Neo-Rationalist thinking of Rossi and others – is interrogated in the tension between historical artefacts and the fusion of culture and commerce that characterises most public buildings today. This tension signals an opportunity for reconciliation or, at least, for mediation. But, as in the debates during the Tendenza years, the obvious answers raise doubts.
 Borasi sums up the ambivalence of this dilemma: 'the words tradition (tradizione) and betray (tradire) sound very similar in Italian'.

Mattia Cipriani's proposals for a contemporary art museum comprise exhibition spaces and administrative, archival and educational accommodation on a Milan site defined by 15th-century Mura Spagnole fortifications. New, giant walls of concrete reassert the memory of a space alienated from its historical urban logic, defining the building's

4. Davide Ravasio and Massimiliano Savino's intermodal station for Tirana shares formal themes with Cipriani's work. In this rendering, an intersection of outdoor spaces is carved out between the station's principal buildings 5. Mixed-use crystalline towers overlook an urban park occupying communal space between the scheme's various pavilions

perimeter. Penetrating this facade, a labyrinthine promenade guides visitors through the interior, as if they were picking their way through rock formations cut by erosion, producing an architecture of episodic events.

Produced jointly by Davide Ravasio and Massimiliano Savino, a project in Tirana, Albania, for an intermodal station - a mixed-use facility for changing from one form of transport to another - adopts similar themes of excavation, sedimentation and landscape. Occupying a parklike zone between rail and road infrastructure, housing and a hospital, the ambitious hybrid scheme distributes offices, retail units, a hotel and passenger transfer hubs in a multi-layered chain of events across the site. Geomorphic forms shape external and internal spaces for everyday commerce, alluding to the historical motif of the Ottoman marketplace (čaršije).

The Politecnico's pedagogical model, building on a critical mass of students and academics, provides a fresh perspective on how those who take ownership of their studies learn more effectively. By contrast with the trend towards pandering to student desires – a symptom of consumer-led education this approach returns us to a world in which the academy is a competitive talent pool. Given the high enrolment numbers, students who don't take up the reins themselves are unlikely to benefit from what faculty members can offer. Sometimes, Zucchi drily notes, even the best students 'get lost in the machine-gun shooting of crossreferences and bizarre quotations'.

In our age of portfolio careers and uncertain prospects, 'educational quality should be defined by the level of autonomous thought it generates in the student'.





REPUTATIONS

Walter Gropius

PAUL DAVIES

Reyner Banham predicted bafflement in any attempt to sum up Walter Gropius. That seems an odd thing to say about such an apparently straightforward architect. Until you try it, that is.

Gropius loved a party. He was a dancer, he was a lover, they say he couldn't draw, and he was 'probably the most influential architectural pedagogue of all time' (James Stevens Curl). He tops and tails many books usefully; for Tom Wolfe he's that silver prince retrospectively responsible for something all wrong, for Pevsner he's the glorious god of the future.

Gropius was born of an illustrious dynasty of architects, but he admitted he had difficulty drawing, working in Behrens' office alongside Mies and Le Corbusier. This was a minor limitation. Perhaps out of necessity he relied on collaboration, which he then elevated to an art form; total cooperative design from teaspoons up. This is how we might understand the psychological genesis of the Bauhaus, which he instigated and directed first in Weimar, then in Dessau, from 1919 to 1928. Under Gropius, the Bauhaus embraced not only the new industrial design we all know, but also new sexually and socially progressive politics we are still apparently not sure about. However, there were definite hangovers, for instance Gropius stated that in the Bauhaus there would be no difference between the 'strong' and the 'beautiful' sex, and believed women thought well in two dimensions, and men in three.

Gropius had gone through a real washing machine of life before he put architecture through the mangle. He survived as a sergeant in the signal corps in the First World War, being both buried under rubble and dead bodies, and shot out of the sky with a dead pilot. He was awarded the Iron

Cross twice. He'd also survived being married to Alma Mahler, reputedly the most beautiful woman in Europe, between her stints with composer Gustav Mahler, Oscar Kokoschka and novelist Franz Werfel before 1920.

He met Alma when he was 27.
She was in rehab after touring with
Mahler, and was prescribed dancing.
She saw him as some Wagnerian
teutonic knight. The sex made
her giddy. Gropius was besotted;
he stalked the Mahler residence
hiding under a bridge. Their affair
sent Gustav onto Freud's couch.
When Walter and Alma were finally
married, secretly, in 1915, Kokoschka
was so upset he resorted to a specially
made Alma love doll.

Gropius shared a life-long antipathy with Mies. They died within months of each other. Mies considered Gropius's greatest achievement the Bauhaus as a name and an idea. Certainly Gropius's ability to attract such a diverse collection of artists to teach there in the first place, and then get them to embrace some apparent new objectivity, was miraculous. Paul Klee said he only signed up because the vegetables were cheaper in Weimar than Munich. Whatever the circumstances, Gropius's team, starting out as transcendentally spiritualist and living on garlic mush, ended up, by iteration and via Gropius's inner grit, the epitome of ruthless pragmatism within a decade. Meanwhile, Alma was a raving anti-Semite who fancied Jewish men.

Despite the name, the Bauhaus was never primarily an architectural school, even in Dessau by 1926, the department occupied one modest room, and Gropius and his partner Adolf Meyer supported their poverty-stricken students by employing them just along the corridor. However, it is a building so razor sharp in intellect it can be reduced to its door handles. Gropius described it totally without hyperbole.

Others didn't. The cultural dissemination of the Gropius machine

'Gropius had gone through a real washing machine of life before he put architecture through the mangle'

Walter Gropius 1883-1969 Education

Apprentice in the office of Peter Behrens where he met Mies van der Rohe and possibly Le Corbusier Educator

Founded the Bauhaus School of Design (1919-1928) Founded The Architects' Collaborative (1945) Key moment

Flod Nazi Germany under the pretext of a temporary visit to Britain with the help of architect Maxwell Fry (1934) Key buildings

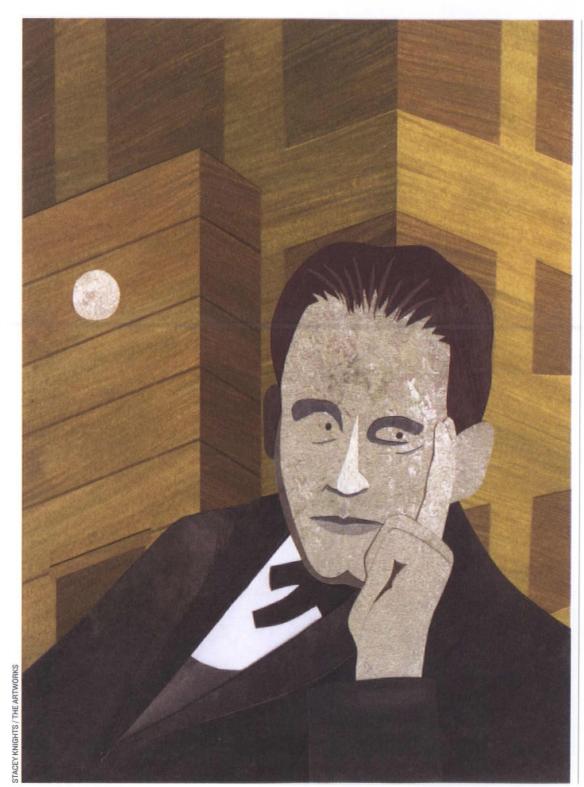
The Fagus-Werk Factory,
Berlin (1911)
The Bauhaus School of
Design, Dessau (1919)
The Gropius House,
Lincoln, Mass (1938)
The Pan Am Building,
New York (1958)

'Architecture begins where engineering ends' aesthetic actually features plenty of hyperbole, including his own during the Alma years. Pevsner by 1936 already considered his prewar Fagus factory aesthetically sublime, as good as the Gothic, noting the chill, but appreciating it as a response to the machine age and necessarily anonymous. By the '80s Reyner Banham was delighted to point out that the Fagus factory was in fact yellow, was a 'skin job' and still full of comfy decorative trimmings. He put the machine aesthetic down to the Americans.

However, the Bauhaus building rings with the clarity of man's dynamism against nature and the pinnacle of that something between everything and nothing that seems the totally modern. Gropius sat in his directorial office in the middle of a pin-wheel plan on a bridge over a road. He incorporated the road a conceit maybe, but this building would seem the embodiment of concepts drawn out of, and rejecting, all turbulent, mystical, creativity, general and personal; the built manifestation of modern humanism. It is ridiculous only in its optimism and its cutting straightforwardness.

But he didn't sit there for long. Thinking the institution secure, and with further opportunities to build, Gropius passed the directorship to the communist Hannes Meyer in 1928. It proved very hard to fill his shoes. Meyer was theoretically more astringent than the urbane Gropius, and the political climate worsened. By 1930, Gropius had ushered in Mies for the final years.

Gropius had discreetly divorced Alma by 1920. Of her conquests she apparently declared that nothing tasted as good as the sperm of a genius. She didn't like his designs or the reek of garlic and the one thing Gropius couldn't collaborate on was music. Gropius, ever the gentleman, allowed himself to be caught with a prostitute to expedite their divorce. Even when his rival Werfel was in danger from the authorities, Gropius



sought him out to warn him. Amid personal tragedy (their daughter, Manon, died of polio at 18, and a second child, born prematurely under excruciating circumstances, was Werfel's) Gropius remained decent.

He irritated Mies with his endless idealism. The ethos of the famous Bauhaus parties soon found form in the Total Theatre (1928), intended to shake spectators from their lethargy. But he was championed by student Sigfried Giedion who was well versed in the destiny of metal tubing to supersede stuffed upholstery. Giedion penned the monograph Walter Gropius: Work and Teamwork in 1954. In it Alma Mahler all but disappears. Gropius had married his second wife Ise (co-author of many of his texts) in 1923.

Gropius's instincts were unsurprisingly for prefabrication. Mies thought the prefabs he contributed to the Stuttgart Weissenhof in 1928 were interesting (but he didn't say good). In England, by 1934 Gropius slotted neatly into Isokon and did some pleasing houses with Maxwell Fry. By 1936, even Mies had lost patience with the Nazis, and the pair found themselves competing for US professorships. Gropius won Harvard. He went on to build his own house in Lincoln, Massachusetts (1938), run a further co-operative practice (TAC), and work as a consultant on his largest piece of prefabrication, the 9,000 concrete panels of the Pan Am building.

I lost out on Bauhaus door handles on eBay recently. They looked great, but really it was the spirit, the myth, some would say the propaganda of the Bauhaus that I let slip. Everybody wants a bit of that total theatre. Generations of educators have been affected in such a way. On his death in 1969, Gropius wanted not tears, but a party. The great pedagogue, that charming man and gallant fighter, an idealist whose work should genuinely be considered as a sum greater than its individual parts, still wanted a good time for all.

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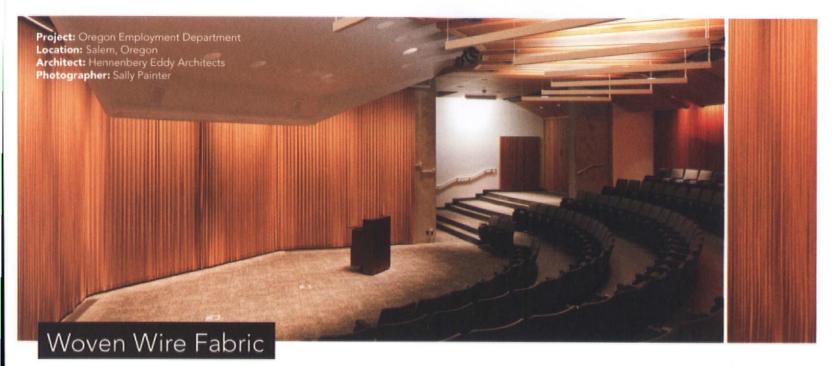


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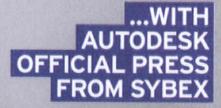
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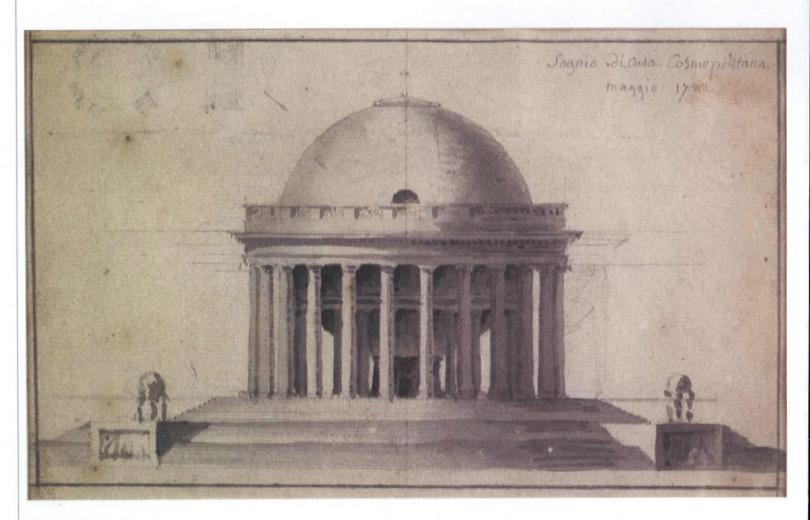
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FOLIO



Antoine Laurent Thomas Vaudoyer, Sognio di Casa Cosmopolitana, 1782

A small sketch study in pencil, ink and wash, dating from the elder Vaudoyer's time at the French Academy in Rome, for his 'maison d'un cosmopolite': a vision of a domestic temple to universal knowledge that began to circulate widely in print and drawn form from 1785 and was ingrained in the architectural discourse for much of the early 19th century.

Vaudoyer's was the best known and perhaps earliest of many late

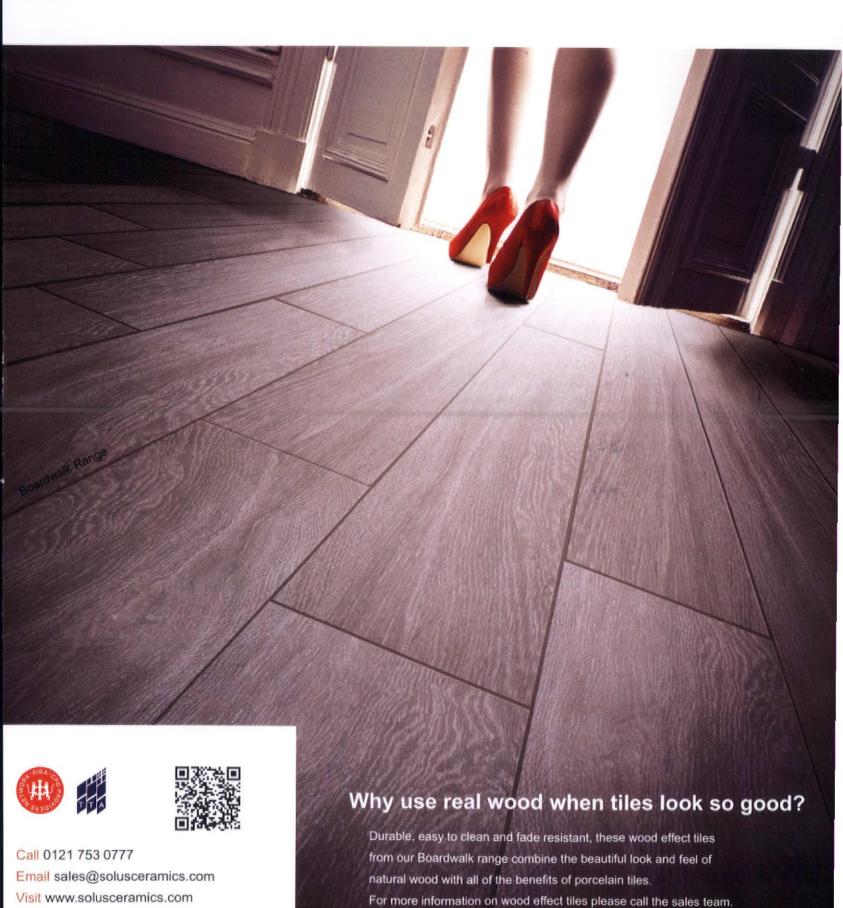
Enlightenment speculations on spherical dwellings and memorials that might capture an entire cosmos of natural science. Vaudoyer lays astronomical and astrological features on its outer surfaces, and organises the interior spaces to capture not just the range of human knowledge, but the varieties of mood, sense and feeling that mark our universal condition.

It is earily prescient of today's cosmopolitan and digital era in which we have access in the single space around us to that vast range of knowledge and ideas of which Vaudoyer was 'dreaming' and to the endless possibility of engaging our emotions with them.

Nicholas Olsberg



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