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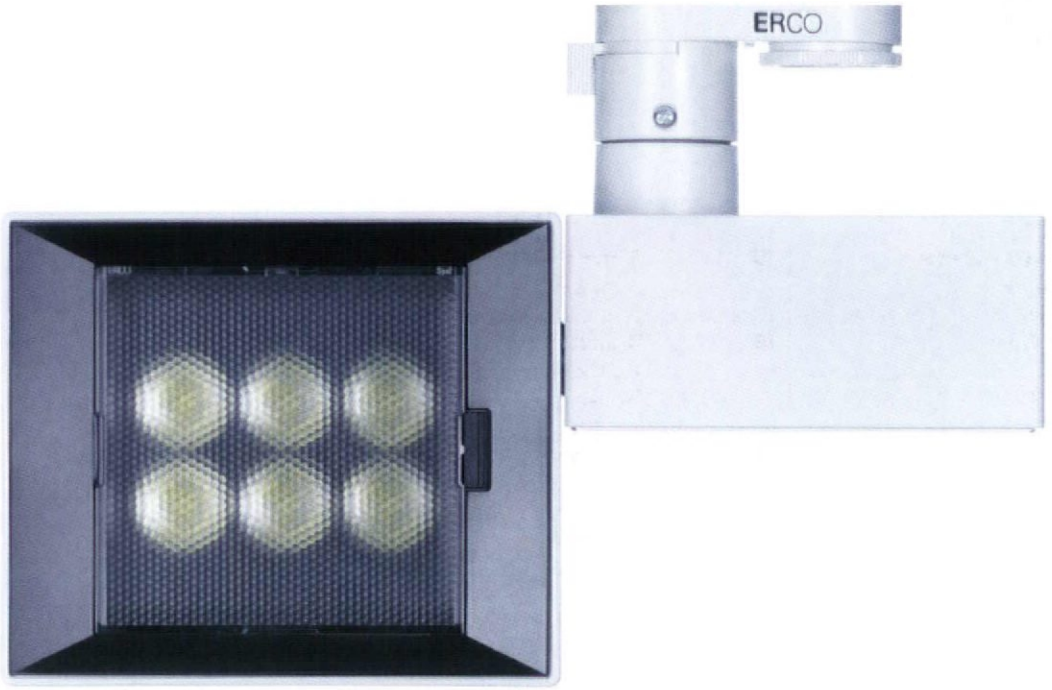

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The Architectural Review
Issue number 1380
February 2012
Volume CCXXXII
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Sero sed serio

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Cover: Luc Boegly

CONTRIBUTORS

Khaled Asfour is associate professor of architecture at Misr International University in Cairo and holds a doctorate in architectural theory from MIT. Born in Giza, he discusses the changing role of the vernacular in Egypt in relation to sustainability

Cany Ash pioneered the first urban farmers' markets in New York. Today she runs the London practice Ash Sakula Architects and this month co-writes a double review of Brentwood School in Essex and Spa School in London for AR's schools edition

Andrew Ayers is author of *The Architecture of Paris* and a regular contributor to these pages. In this issue, he critiques the thoughtfully detailed new school by AAVP Architecture in Saint Denis, Paris

Matthew Barac is a senior lecturer at London's South Bank University and also our Pedagogy correspondent. He writes on the uncommonly strong connection to high-density Asian cities that underpins the teaching style at RMIT University

Peter Blundell Jones is professor of architecture at the University of Sheffield. This month, he revisits a Lucien Kroll school in Caudry, France, which in 2002 was hailed by *The Architectural Review* as a significant leap forward for green architecture

Peter Buchanan is a London-based architecture critic, writer and lecturer. Former deputy editor of *The Architectural Review*, he leads the AR's return to campaigning with the second instalment of our series the Big Rethink

Peter Cook is known to our readers – and around the world – for Archigram, the Bartlett, and now his studio, Crab. This month, he ponders the death of drawing from his train carriage *en route* to the Drawing by Drawing exhibition in Copenhagen

Peter Davey was editor of *The Architectural Review* for the best part of a quarter century. He has written numerous titles, including *Arts and Crafts Architecture,* and has been knighted in Finland. This month, he critiques a refreshingly original book on John Ruskin by Lars Spuybroek

Dennis Gilbert photographed Lucien Kroll's Caudry school for Revisit. Since the 1980s, he has been photographing classic 20th-century buildings and in 2005 was awarded an honorary fellowship to the RIBA for his contribution to architecture

Rhys Gwilym is a Welsh film-maker and an architectural critic. A first-time contributor to these pages, he inspects the New Orleans rebuilding project, *Make It Right,* which is backed by actor Brad Pitt

Gillian Horn is a partner at Penoyre & Prasad. Once project architect for Sarah Wigglesworth's innovative Straw Bale House, she is well placed to review the practice's new school in Wakefield

Christian Kühn is professor of architecture at the Institute of Architecture and Design in Vienna. For Typology Quarterly, he discusses the changing role of architecture in education and examines four outstanding schools from the last decade

Raymond Lemstra is an Amsterdam-based artist whose work makes reference to the illustrative nature of primitive drawings and sculpture. In this issue, his fine graphite rendering of Alison and Peter Smithson adorns Reputations

Louise Noelle Gras is an art historian and was editor of *Arquitectura/México* from 1976 to 1980. For this issue she writes an obituary to her great friend and colleague, the Mexican architect Ricardo Legorreta

Steve Parnell is the former contributing editor of *The Architects' Journal* and holds a doctorate on the role of the architectural magazine. In this issue he considers the legacy of Team X members and a life-long architectural partnership, the Smithsons

Luigi Prestinenza Puglisi is a seasoned Italian architectural writer and critic based in Rome. He is author of many titles, most recently *New Directions in Contemporary Architecture*. For this issue, he reviews *RE-CYCLE*, the first architectural show to have been produced by curators of the MAXXI Museum in Rome

Joseph Rykwert is one of the leading authorities on the history of architecture and art. He is an accomplished educationalist, having held many university teaching posts in Britain and the US. He is Paul Philippe Cret Professor of Architecture Emeritus and Professor of Art History at the University of Pennsylvania. Here Rykwert reviews *Da Vinci's Ghost* by Toby Lester

Robert Sakula worked in Mexico and Monte Carlo before returning to the UK to partner up with Cany Ash and found the practice Ash Sakula Architects. An awards assessor for the Civic Trust, he co-writes our double review of two UK schools

Patrik Schumacher is a company director of Zaha Hadid Architects, where he completed the MAXXI Museum in Rome. Author of *The Autopoiesis of Architecture*, in this issue he condemns the current trend in student work exemplified by the RIBA President's Medals

Rupert Sheldrake is a biologist and writer on contemporary science. Author of *The Science Delusion* and former research fellow of the Royal Society, he writes this month's Broader View, in which he questions modern science's materialistic view of the world

Richard Weston is professor of architecture at the Welsh School of Architecture. An esteemed architectural historian and author of the award-winning *Modernism,* in this issue he draws on his fascination with form in nature to review Michael Pawlyn's *Biomimicry in Architecture*

Austin Williams is lecturer in architecture at Xi'an Jiaotong-Liverpool University in Suzhou, China, and author of *The Lure of the City: From Slums to Suburbs*. This month, he scrutinises the moralising environmentalist movement and Roger Scruton's latest book, *Green Philosophy*

THE ARCHITECTURAL REVIEW

EDITORIAL

Editor
Catherine Slessor
catherine.slessor@emap.com
+44 (0)20 7728 4592
Deputy Editor
Will Hunter
will.hunter@emap.com
Art Editor
Jon Morgan
jon.morgan@emap.com
Editorial Assistant
Phineas Harper
phineas.harper@emap.com
+44 (0)20 7728 4589
Design Consultant
Simon Esterson
Production Editors
Nicola Homer
Julia Dawson
Digital Editors
Simon Hogg
Tom Ravenscroft
Editorial Interns
Masha Kuzmenko
Parvinder Marwaha
Research Assistant
Georgina Ward
US Contributing Editors
Michael Webb
Mark Lamster
Associate Editor
Rob Gregory
Editorial Director
Paul Finch

PUBLISHING

International Account Manager
Bharat Joshi
+44 (0)20 7728 5261
bharat.joshi@emap.com
UK Account Manager
Alan Carter
+44 (0)20 7728 4560
alan.carter@emap.com
Business Development Manager
Nick Roberts
+44 (0)20 7728 4608
nick roberts@emap.com
Business Development Manager
Ceri Evans
+44 (0)20 7728 3595
ceri.evans@emap.com
Marketing Executive
Kate Keogh
+44 (0)20 7728 3932
kate.keogh@emap.com
Commercial Manager
James MacLeod
+44 (0)20 7728 4582
james.macleod@emap.com
Italian Advertising Sales Milan
Carlo Fiorucci
+39 0362 23 22 10
carlo@fiorucci-international.com
US Advertising Sales New York
Kate Buckley
+1 845 266 4980
buckley@buckleypell.com
List Rental
Jonathan Burston
+44 (0)20 8995 1919
jburston@uni-marketing.com
Director of Architecture and Media
Conor Dignam
+44 (0)20 7728 5545
Group Managing Director
Natasha Christie-Miller

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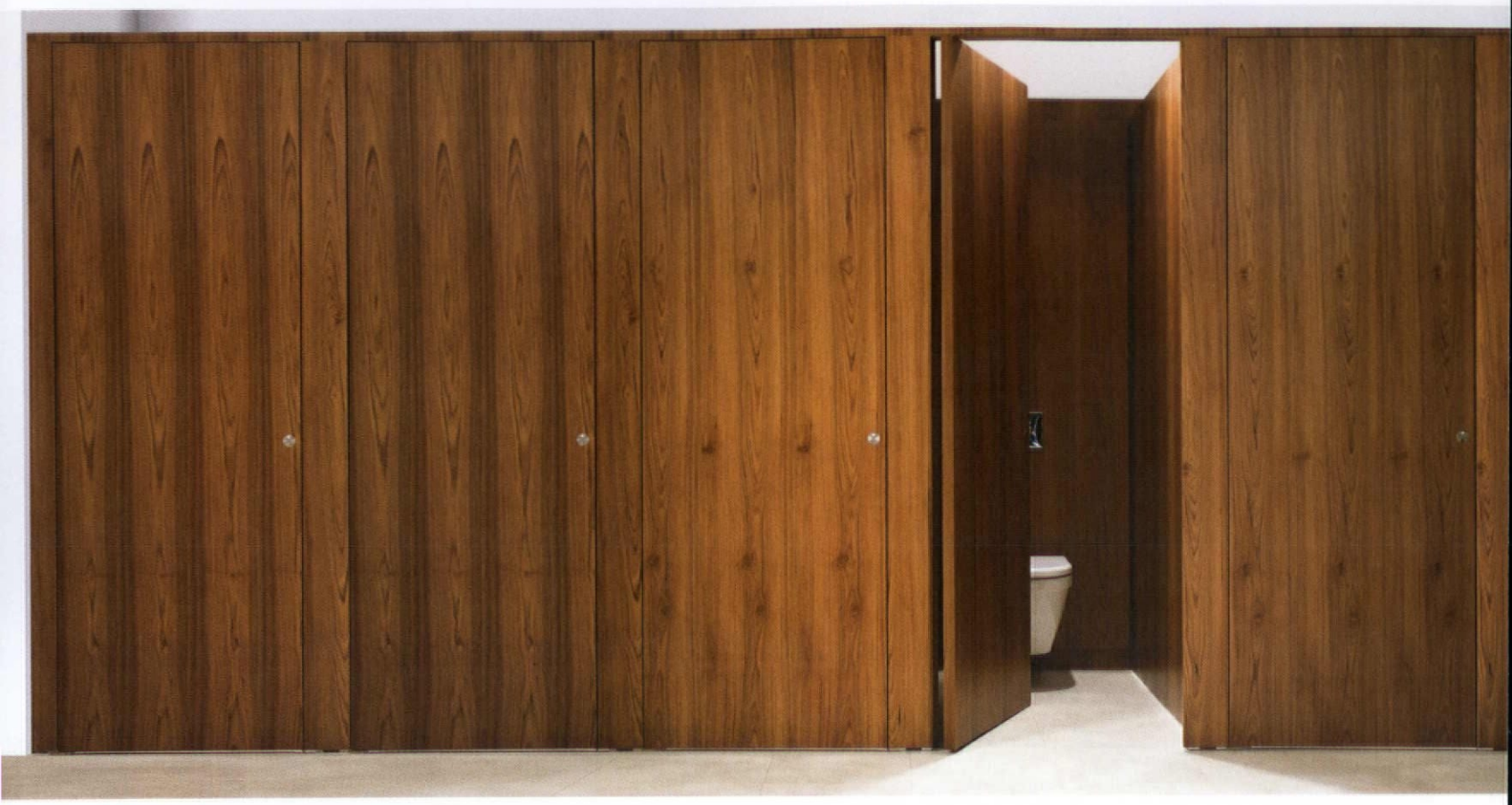

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For nearly a century, Formica® laminate has defined the look and performance of modern interiors. Now, building on years of exterior cladding success in European markets, Formica Group remains at the leading edge of building envelope technology and aesthetics. The development of VIVIX, an innovative exterior lightweight rainscreen cladding system, redefines the landscape of contemporary construction for both new build and renovation projects.

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Design and application

VIVIX provides solid phenolic, engineered exterior facade panels with decorative surfaces on both sides. Developed in consultation with leading architects and colour consultants, VIVIX panels are available in plain colours, featuring sophisticated neutrals and striking accents, as well as nature-inspired abstract patterns and rich woodgrains.

The VIVIX range offers the possibility of creating many different visual effects in a cost-efficient way. VIVIX panels can be used for cladding an entire building or simply highlighting individual architectural features. The versatile panels can also be used for other kinds of exterior applications such as balconies, soffits, decorative screening and fencing, or to accent an entrance, emphasise different floors or departments, or simply to create a distinctive and eye-catching pattern that makes a particular building stand out.

Recently, VIVIX was specified for the exterior of La Pobla De Vallbona, a sports centre in the Spanish city of Valencia, designed by AC Architecture. VIVIX was selected because of its innate versatility, flexibility and durability. 'The material was the ideal option for this project, where we wanted durable materials together with technology that maximised energy savings,' says architect Emilio Conejero, principal of AC Architecture.

'VIVIX panels allow architects to balance considerations of appearance, design, maintenance and cost efficiency when choosing exterior cladding,' says Simon Wild, European Marketing Director of Formica Group. 'As part of a ventilated rainscreen facade system, the panels offer a range of finishes and patterns, creating exteriors that can be either understated or flamboyant.'

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Formica Group continues to innovate and lead the market in decorative laminates. A visionary approach to product development coupled with the application of advanced technology enables Formica Group to devise and manufacture products that continue to inspire and excite the market. Working closely with architects and designers, the company is ideally placed to offer innovative products that respond to market needs and complement current design trends.

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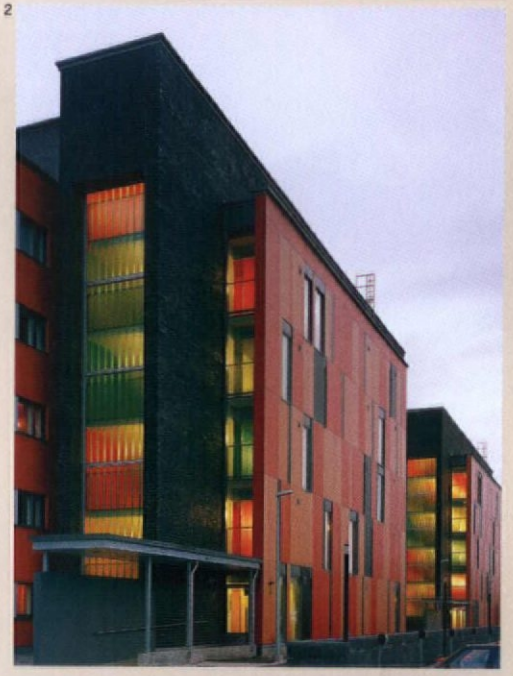

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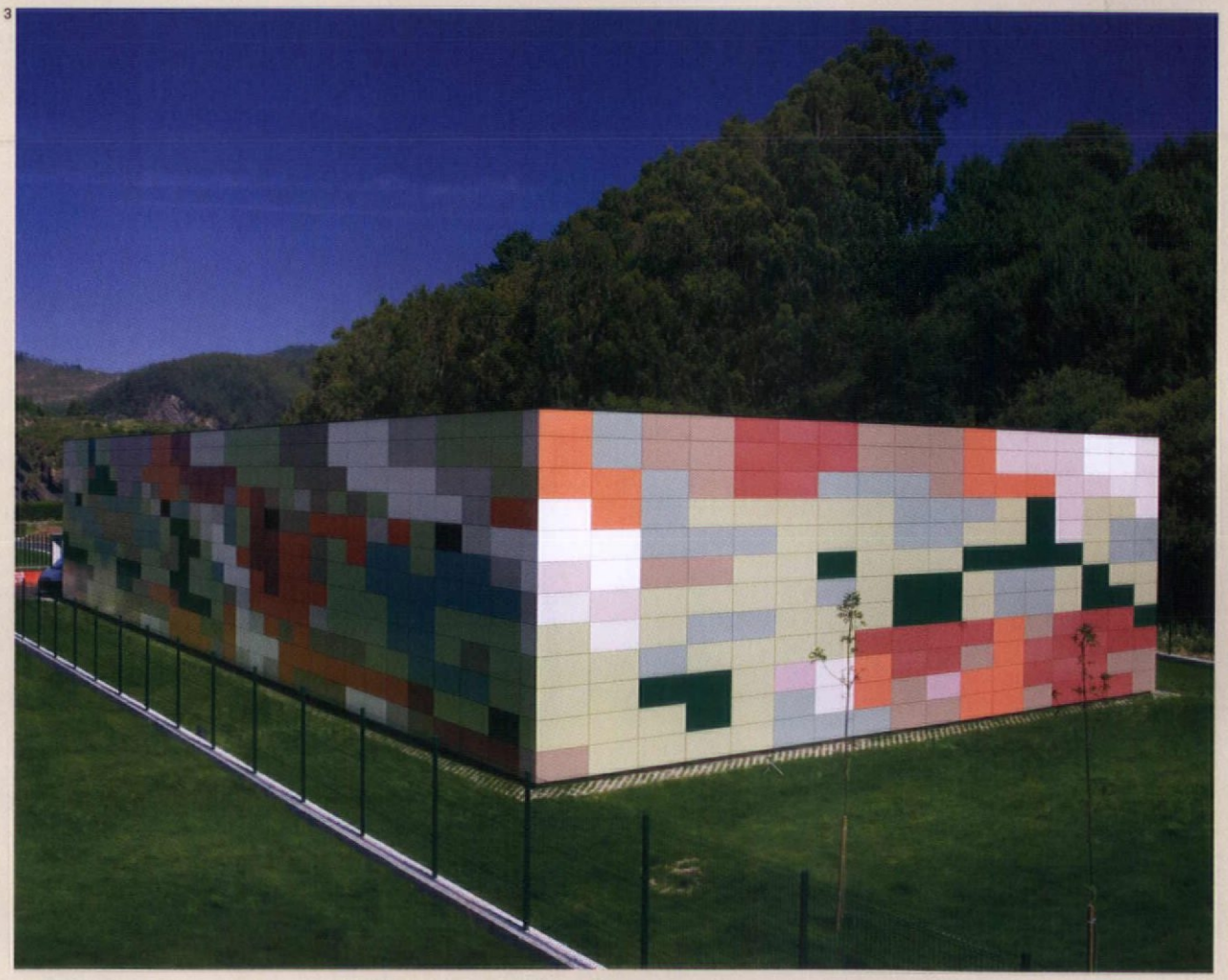

1. Recent projects where VIVIX® architectural panels have been specified include the exterior of a sports centre, La Pobla De Vallbona, in Valencia, Spain, by AC Architecture. VIVIX was chosen because of its versatility, flexibility and durability. 'It was the ideal option for this project, where we opted for long-lasting materials with technology that maximise energy savings,' said architect Emilio Conejero.

2. VIVIX panels can complement or add interest to office buildings, public, cultural and sports facilities, transportation centres, industrial buildings, educational facilities, residential developments and more through the use of colour blocking.

3. Resistant to impact and abrasion, VIVIX panels are not only weather-resistant and enhance a building's life span, but they can also contribute to a building's thermal efficiency.

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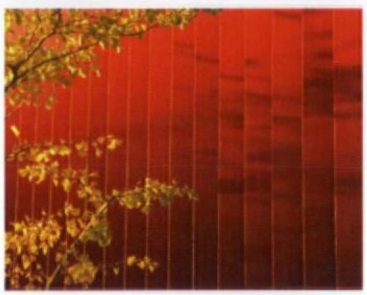

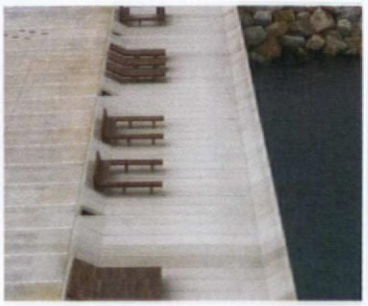

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STORYTELLING
BOONSERM PREMTHADA AND MOLO DESIGN

Tuesday 7 February 18.30

Bangkok based, Boonserm Premthada's design approach is one of adventurousness and artistic daring- particularly in the application of materials. The Kantana Film and Animation Institute's bold use of brick creates spaces that are at once dynamic, yet monastic. Boonserm talks about the inspirations behind the project and the challenges of creating this distinctive new learning environment in the tropics.

Enclosed by ribbons of twisted steel, Molo Design's Nebuta House draws on Japanese building principles to create a new home for a national tradition. Nebuta Matsuri is a form of storytelling in Japan during which heroes and creatures from myths come to life as colourful, large-scale, illuminated paper lanterns (*nebuta*). Canadian practice Molo dicusses this unique cultural project and the challenges of how to balance the milieu of the city and the sheltered, comtemplative interior.

WATERSIDE
CREUSE CARRASCO ARQUITECTOS AND JOSE MARIA SANCHEZ GARCIA

Tuesday 14 February 18.30

Creuse Carrasco Arquitectos are a practice whose work is concerned with creating social space and intervention. Their remodelling of the harbour at Malpica, a remote fishing village on Galicia's 'Coast of Death' in north-eastern Spain, is inspired by place and landscape. Creuse Carrasco discusses the Malpica project, which provides facilities for the fishing fleet, while creating a dynamic new set of public spaces aimed at reversing the fortunes of the village and creating new visitor appeal.

Madrid based Estudio de Arquitectura José María Sánchez's new centre for rowing located on the Alange Reservoir in south-west Spain is a striking new building addressing nature yet barely intruding into it. It provides elite training and competition facilities and brings together nearby facilities in a straightforward way. Jose Maria Sanchez presents this and other projects demonstrating the practices approach to lightness and material refinement.

HABITATS
ZIGZAG ARQUITECTURA AND CHINTHAKA WICKRAMAGE

Tuesday 28 February 18.30

Established in 2005, Zigzag Arquitectura have worked extensively in design and research. Recipients of several awards, they discuss their new social housing scheme in Mieres, northern Spain, which inventively reworks an urban archetype. A generic courtyard block has been reassembled to create new and varied compositions distinguished by bold geometries, while managing to remain humane in its scale.

Chinthaka Wickramage draws on the rich vernacular tradition of Sri Lanka while working to respond to modern day requirements. A new community centre in Thalalla built to a budget of £34,000 restores essential services to a community devastated by the 2004 tsunami. Wickramage discusses the project and an approach to building which adopts the ancient Buddhist tradition of *tam pita viharas* (construction supported on pillars), so that it can withstand the effects of flooding.

Editorial view

Radical new understandings in science, energy and the economy must be embraced by architects

How does architecture connect with the larger realities of essential humanity? Human civilisation is in a constant state of flux, and from medieval cathedrals to the Villa Savoye, architecture has reflected the prevailing spirit of the age. But as Peter Buchanan argues in the second part of the AR's Big Rethink (p82), the technocratic certainty of modernity, with its emphasis on linear progress, disconnection from place and the subduing of nature, is now regarded as fundamentally discredited (despite its technological legacy), not least because of a perilously unsustainable reliance on fossil fuels.

Now a new epoch is emerging, based on radical scientific discoveries that challenge and reconceptualise former assumptions. Newton's vision of a mechanistic universe is being superceded by the idea of a living, organic universe, a complex, evolving and elusive organism that is still not fully understood and indeed may never be. But the repercussions of such a paradigm shift are already evident, as leading scientist Rupert Sheldrake demonstrates in *Broader View* (p20).

The socio-cultural structures and certainties of the Industrial and Information Ages are giving way to the more nebulous Conceptual Age, with its emphasis on creativity and empathy. And the Third Industrial Revolution presages new approaches to energy use, communications and the power of corporatism. This epochal change prompts speculation about architecture's changing relationship with humanity and the planet. Rather than the current culture of globalisation, with its emphasis on consumption, planned obsolescence and nomadism, there is a need to rediscover notions of common endeavour, long-term stewardship and genuine sustainability (as opposed to publicity-seeking greenwash).

How can architects respond to this shifting landscape? As Patrik Schumacher observes (p16), though architecture has its own discourse and unique societal responsibility, it evolves in tandem with other subsystems, such as the economy, politics, the mass media and science. Within this co-evolution, innovative architecture can be as much a catalyst for progress as these other economic and cultural forces.

Drilling down further, some sense of how this change might be manifested can be gleaned in the critiques and analyses of schools that feature in the issue. In particular, *Typology* (p59) examines the development of schools, and how built form has articulated the social ambitions of different historical epochs. The stern edifices of Victorian schools spoke of rigour, religion and discipline, fitting their charges for the Machine Age, while the schools of the Modern Movement prepared pupils for life in the growing services sector. Now, a new generation of buildings cultivate a sense of informality and connectivity, creating the potential for encounter and the challenges of the knowledge economy. Even at this scale, the mechanistic is giving way to the fluid; the school as universe, the cosmos in microcosm.

Catherine Slessor, Editor

Overview

LONDON, UK

A waste of young talent

Irony, allegory and dystopia – *Patrik Schumacher* sees no future for the type of hopelessly unrealistic education lauded by the British architectural establishment

The submissions to the current RIBA President's Medals demonstrate once more that architectural education in Britain is operating in a parallel universe. The (best?) students of the current generation as well as their teachers seem to think that the ordinary life processes of contemporary society are too boring to merit the avant-garde's attention. Instead we witness the invention of scenarios that are supposedly more interesting than the challenges actually posed by contemporary reality. The points of departure for the majority of projects are improbable narratives with intended symbolic message or poetic import. Accordingly, the resultant works are statements or allegories rather than designs.

This is evidenced by the emphasis on evocative, atmospheric imagery, with little or no demonstration of how the visualised spaces organise and articulate social life processes and institutions. For instance, the Bronze Medal (first prize in the Part 1 category) proposes to place 'an acoustic lyrical mechanism' into a quarry in Bangalore. 'The building is played by the wind, acoustically transforming the abrasive sounds of quarrying.' The Silver Medal (first prize in the Part 2 category) presents itself in the form of a dystopian science fiction movie in which Brixton is transformed into 'a degenerated and disregarded area inhabited by a robot workforce'. The robots are supposed to symbolise immigrant labourers; they are meant to represent racist exploitation. One of the runner-up projects presents itself with sarcasm as a 'genetically engineered "nature factory" for luxury goods, masquerading as a revamped "eco-industry"'. Like the Robots of Brixton this 'nature factory' is not a design but an ironic allegory intended as critical commentary.

RIBA Silver Medal first prize: the Robots of Brixton by Kibwe Tavares

The other projects in this category that have been selected and highlighted by the *RIBA Journal* (by publishing them with a project description) 'engage' the following 'topics': an algae monitoring facility, a retreat for Echo from Ovid's *Metamorphoses*, and a storage building based on the fictional narrative that all citizens would deposit personal things into safety boxes throughout their lives in order to be later confronted by their past. Although there is rather less explanation about the other entries, the project titles (eg, Pyrolytic Power Plant, Tsunami Alert Community, Hydrodynamic Landscape, Mushroom Farm, Guild of Tanners and Butchers) as well as the dominance of atmospheric (mostly dark, cloudy, poetic and dystopian) imagery suggests a similarly idiosyncratic, unreal understanding of what constitutes a worthy design brief. The last two years were also similar: the 2010 winner was a 'shipwrecking yard' and the 2009 winner proposed 'motorised coastal defence towers acting as a warning device to mankind with respect to climate change'. Again, these are not designs of spaces intended to frame social life, these are narratives and messages pushed by evocative imagery.

There is no doubt that creative imagination and skills are in evidence here. However, it is difficult to see what such works achieve and contribute to the advancement of the discipline of architecture. The RIBA's director of education, David Gloster, seems to endorse what I criticise here: 'The ability of the best work to create its own world while still reflecting everything that has been going on around its authors was captivating.' Gloster also welcomes what he considers to be 'a pronounced political edge' and he takes this as an indication that 'students haven't given up on architecture as catalyst for change'. I believe that

architecture co-evolves with other subsystems of society like the economy, politics, the mass media, science etc. In this co-evolution innovative architecture can be as much a catalyst for progress as innovations in science, the mass media, or in the political system. However, I doubt if the invention of other worlds as arenas for imaginative design is the way to achieve this. I also doubt that architecture could be a site of radical political activism. I believe that architecture is a *sui generis* discipline (discourse and practice) with its own, unique societal responsibility and competency. As such it should be sharply demarcated against other competencies like art, science/engineering and politics.

Architects are called upon to develop urban and architectural forms that are congenial to contemporary economic and political life. They are neither legitimised, nor competent to argue for a different politics or to 'disagree with the consensus of global politics' (as David Gloster suggests). 'Critical architecture' commits the fallacy of trying to substitute itself for the political process proper. The result might be a provocation at best, but often ends up as nothing but naive (if not pompous) posturing. Success in the world is not to be expected from such pursuits. The demonstration of creative imagination and virtuoso visualisation skills is not enough to merit an award. Should we not expect the best students and teachers at the best architecture schools to make a serious contribution to the innovative upgrading of the discipline's capacity to take on the challenges it might actually face via its future clients and commissions?

I consider the best schools to be a crucial part of the avant-garde segment of the discipline charged with the permanent innovation of the built environment. It is here that systematic research and serious design experiments can be conducted in ways that are more principled and more forward looking than would be possible within professional practice on the basis of real commissions. Academic design research allows designers to select and focus on specific aspects of the built environment, and abstract from other aspects. Academic design research – and a Part 2 project could play this role – is not a full simulation of a real project with all its concerns. Thus neither the design brief, nor the design solution of an academic thesis project, have to be pragmatic in a straightforward way. The realism I mean is of a more subtle order. It calls for an optimistic probing of our contemporary world with respect to the opportunities it offers and considers the vogue of otherworldly narratives as counterproductive.

More RIBA President's Medals 2011 winning projects at architectural-review.com/folio

NEW ORLEANS, USA

Pitt's pet project fails to deliver

Rhys Gwilym

Housing construction decline is everywhere, and everyone is desperate for a good news story. But even so, it seems odd that there should be so much praise given to a US project that has constructed a mere 50 houses in five years. That's about 40 people being housed every 12 months. The fact that this paltry new-build statistic relates to New Orleans' Ninth Ward, the city region most devastated by Hurricane Katrina, makes it even more tragic. It was here in 2005 that some 4,000 people lost their homes, and, at this rate, the last person will be rehoused in a hundred years' time. Maybe this project is celebrated because it makes the official US construction statistics look dynamic by comparison: just 471,000 single-family homes were started in 2009, representing a mere one third of those that were erected way back in 1978.

CORBIS

Brad Pitt tries to make it right in New Orleans with plans for 150 affordable homes

The Make it Right Foundation is headed by actor Brad Pitt. He is the man regularly referenced in the press as Frank Gehry's acolyte and is the architectural dynamo responsible. He founded Make It Right in December 2006 to build a total of 150 affordable homes and he's one-third of the way there. Calling in favours from friends – and those wanting to be friends – Pitt has commissioned a ragtag army of starchitects to design large family homes that will also be 'green' and 'storm resistant'. They are also described as safe and healthy homes inspired by William McDonough's ubiquitous 'Cradle to Cradle' brand. Each house is based on the traditional shotgun layout: narrow, deep houses, although instead of linking one room to the next, these modern versions have been provided with corridor separation between rooms.

Adjaye Associates, Gehry Partners, Shigeru Ban and Kieran Timberlake are among the many big names pledging their support. Adjaye has three schemes on site, each a development from the one before, seemingly using the site as an experimental playground in order to learn from elementary mistakes in the previous layout. The architects sketch a notional design for the plot and hand it over to local builders to make it work (as distinct from: make it right). As a result they are poorly detailed, with flashings nailed to timber upstands, waterspouts discharging onto enclosed staircases, minimal threshold and cills, and high maintenance exteriors. Throughout, the detailing is shoddy but cunningly disguised by the quirky architecture.

The Lower Ninth Ward's housing development was set aside for returning black servicemen after the Second World War. It was the first time that black people were allowed to own their own homes and to pass them down through their families. Rather than being created as a ghetto (as it is regularly portrayed), its origins were, in fact, reasonably enlightened. While Pitt's laudable ambition has been to recreate that sense of community, it is he who seems to have created the ghetto, albeit an attractive one.

This is because each home is an individual ark. The central focus of the house is the rooftop refuge: a flat-roof designed to be above the worst-case water level. Here people can stand safely waving to emergency helicopters, rather than balancing precariously on pitched roofs as they did back in the day. This project – this architecture – is based on an explicit paranoia about the environment. In the past, New Orleans was known as 'an inevitable city on an impossible site', summing up the desire to transform a location fraught with

Thom Mayne's Floating House sits above the ground, ready to float in a flood

natural hazards into a place of tremendous urban potential. However, these homes are the opposite. Rather than being a project premised on a new generation of infrastructural flood defences that will preserve and protect the entire community, each I'm-All-Right-Jack house will preserve the lives of individual homeowners. Thom Mayne's Floating House admirably sums up the concept. This is a community of Noahs.

Conceptually, these homes are more indicative of hurried emergency dwellings than the dawdling programme of works on display here. In one sense, at least someone is doing something, but it is symptomatic of the inadequate housing ambitions at federal and national government level that it has been left to a celebrity's whim to construct these fetishistic homes.

OBITUARY

Ricardo Legorreta 1931–2011

Louise Noelle Gras

With the death of Ricardo Legorreta on 30 December 2011, contemporary architecture lost one of its leading lights. He was a Mexican proud of his heritage yet enthusiastic to embrace international commissions and the technology of the future.

Born in Mexico City on 7 May 1931, Legorreta studied architecture at Universidad Nacional Autónoma de México (UNAM). He started his professional life working with José Villagrán García – a pioneer of Mexican Modern architecture – and was his partner 1955-60. Initially he flirted with industrial architecture, where he felt at ease solving the requirements of manufacturing processes. He then turned his attention to private houses, the interiors of which he considered an integral part of the process, where he brought his experience in the design of furniture and accessories to bear. His spaces are imbued with warm textures and colours, with natural materials like terracotta, wood and textiles, and with refined details displaying indigenous craftsmanship; all delicately balanced between austerity and generosity.

The main characteristics of his style result from the gifted way he assembled wall planes, using light sparingly and appropriately. The exterior result is of marked and powerful vibrant volumes, with a horizontal tendency that protects generous internal spaces: kind and welcoming, yet belonging very much to the locale.

Among his many hotel projects, Legorreta's Hotel Camino Real in Mexico City (1968) is a masterpiece, it combines an intimate nature with the complex corporate needs of the hotel industry.

Over the last two decades works relating to culture and education were at the forefront of his output. Libraries included the Universidad Autónoma de Nuevo León (1994), in Monterrey and the Centro Nacional de las Artes in Mexico (1994), as well as the Central Library, in San Antonio, Texas (1995). For his higher education institutions, the designs incorporated state-of-the-art means of transmitting knowledge without, however, neglecting the importance of easy student interaction. Examples include the Graduate Business School in Monterrey (2001) and the campus 'Santa Fe' in Mexico City (2009), where he also built the facilities of the Graduate Building for the Economic Faculty at the UNAM (2010).

In the Middle East he designed for the Qatar University at Doha, the Texas A&M Engineering College (2007) and the Carnegie Mellon College of Business and Computer Science (2009) as well as student housing and the campus centre at the American University in Cairo (2009). In the UK Legorreta is perhaps best-known for the museum for fashion designer Zandra Rhodes (2001) in Bermondsey, London, where he adapted a former warehouse building with his trademark flamboyant colours.

Legorreta's work stemmed from an in-depth understanding of the values of architecture and the mastery of technique. He was inspired by both Luis Barragán's proposals and the ideas of Louis Kahn. He founded Legorreta Arquitectos with Noé Castro and Carlos Vargas 1963, and this became Legorreta + Legorreta in 2000. The practice continues to be run by his son Victor.

Museo Laberinto de Ciencias y Artes: Ricardo Legorreta builds in his native Mexico

ONLINE THIS MONTH

The architect Isi Metzstein died on 10 January, aged 83. Under the umbrella of the Glasgow practice of Gillespie Kidd & Coia, he co-authored some of the most remarkable examples of modern architecture in postwar Britain. A former student of Metzstein's, Clare Wright has written an appreciation of his life, which can be found at architectural-review.com/IsiMetzstein

The AR is media partner for Saturated Space, a research group focusing on colour in architecture. The first event is taking place at the Architectural Association in London on Tuesday 7 February, with a range of speakers including Louisa Hutton and Peter Salter. The events are free to attend and further information can be found at architectural-review.com/SaturatedSpace

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Broader view

Liberating science

Today's architectural practice is profoundly shaped by dogma that has dominated science since the late 19th century – and yet this influence remains largely unquestioned within the profession. As part of the AR's Big Rethink, *Rupert Sheldrake* exposes the 'credibility crunch' in modern science's materialist view of the world. In the Campaign essay on page 82, *Peter Buchanan* starts to explore the implications of this fundamental shift

The 'scientific worldview' is immensely influential because the sciences have been so successful. The prestige of science shaped Modernism, and still dominates most of its postmodern descendants. Yet in the second decade of the 21st century, when science and technology seem to be at the peak of their powers, when their influence spreads all over the world and when their triumph appears indisputable, unexpected problems are disrupting the sciences from within.

The 'scientific worldview' is based on the claim that all reality is material or physical. There is no reality but material reality. Consciousness is a by-product of the physical activity of the brain. Matter is unconscious. Evolution is purposeless. God exists only as an idea in human minds, and hence in human heads.

These beliefs are powerful not because most scientists and their followers think about them critically, but because they don't. The facts of science are real enough; and so are the techniques that scientists use; and so are the technologies based on them. But the belief system that governs conventional scientific thinking is an act of faith.

Here are the 10 core beliefs that most scientists and their followers still take for granted:

- Everything is essentially mechanical. Dogs, for example, are complex mechanisms, rather than living organisms with goals of their own. Even people are machines, 'lumbering robots', to use Richard Dawkins's vivid phrase, with brains like genetically programmed computers.
- All matter is unconscious. Even human consciousness is an illusion produced by the material activities of brains.
- The total amount of matter and energy is always the same (with the exception of the Big Bang, when all the matter and energy of the universe miraculously appeared).
- The laws of nature are fixed.
- Nature is purposeless.
- All biological inheritance is material, carried in the genetic material, DNA, and in other material structures.
- Minds are inside heads and are nothing but the activities of brains.
- Memories are stored as material traces in brains and are wiped out at death.
- Unexplained phenomena like telepathy are illusory.
- Mechanistic medicine is the only kind that really works.

Together, these beliefs make up the philosophy of scientific materialism, a belief system that became dominant within science in the late 19th century, and is now taken for granted by most educated Europeans. From the 17th to 19th centuries, science was based on mechanistic dualism: the universe was a machine, and so were animals and human bodies, but human minds and God were immaterial, part of a separate spiritual reality. Materialism took mechanism further by denying anything immaterial: everything is material or physical.

For more than 200 years, materialists have promised that science will eventually prove their assumptions that living organisms are complex machines, minds are nothing but brain activity and nature is purposeless. The philosopher of science Karl Popper called this stance 'promissory materialism' because it depends on issuing undated promissory notes for discoveries not yet made. Despite all the achievements of science and technology, materialism is now facing a credibility crunch that was unimaginable in the 20th century.

In 1963, when I was studying biochemistry at the University of Cambridge, I was invited to a series of private meetings with Francis Crick and Sydney Brenner in Brenner's rooms in King's College, along with a few of my classmates. Crick and Brenner had recently helped to 'crack' the genetic code. Both were ardent materialists. They explained there were two major unsolved problems in biology: development and consciousness. Crick and Brenner were going to find the answers within 10 years, or maybe 20. Brenner would take developmental biology, and Crick consciousness. They invited us to join them.

Both tried their best. Brenner was awarded the Nobel Prize in 2002 for his work on the development of a tiny worm, *Caenorhabdytis elegans*. Crick corrected the manuscript of his final paper on the brain the day before he died in 2004. But the problems of development and consciousness remain unsolved. Many details have been discovered, dozens of genomes have been sequenced, and brain scans have become ever more precise. But there is still no proof that life and minds can be explained by physics and chemistry alone.

The fundamental proposition of materialism is that matter is the only reality. Therefore consciousness is nothing but brain activity. It is either like a shadow, an 'epiphenomenon', that does nothing, or it is just another way of talking about brain activity. However, among contemporary researchers in neuroscience and consciousness studies there is no consensus about the nature of minds.

Leading scientific journals like *Behavioural and Brain Sciences* and the *Journal of Consciousness Studies* publish many articles that reveal deep problems with the materialist doctrine. The philosopher David Chalmers has called the existence of subjective experience the 'hard problem'. It is hard as it defies explanation in terms of mechanisms. Even if we understand how eyes and brains respond to red light, the experience of redness is not accounted for. In biology and psychology the credibility rating of materialism is falling fast. Can physics bail them out?

BETTEMANN/CORBIS

William Blake's *Newton* (1795) shows the natural philosopher absorbed by reductive scientific thought: he cannot see beyond the rules of his compass to the creative world beyond

Physicists face several intractable problems of their own. The most ambitious unified theories of contemporary physics, string and M-theories, with 10 and 11 dimensions respectively, are untestable. Many scientists and philosophers of science regard untestable theories as unscientific. Untestable theories now dominate theoretical physics.

Since the beginning of the 21st century, it has become apparent that the known kinds of matter and energy make up only about four per cent of the universe. The rest consists of 'dark matter' and 'dark energy'. The nature of 96 per cent of physical reality is literally obscure.

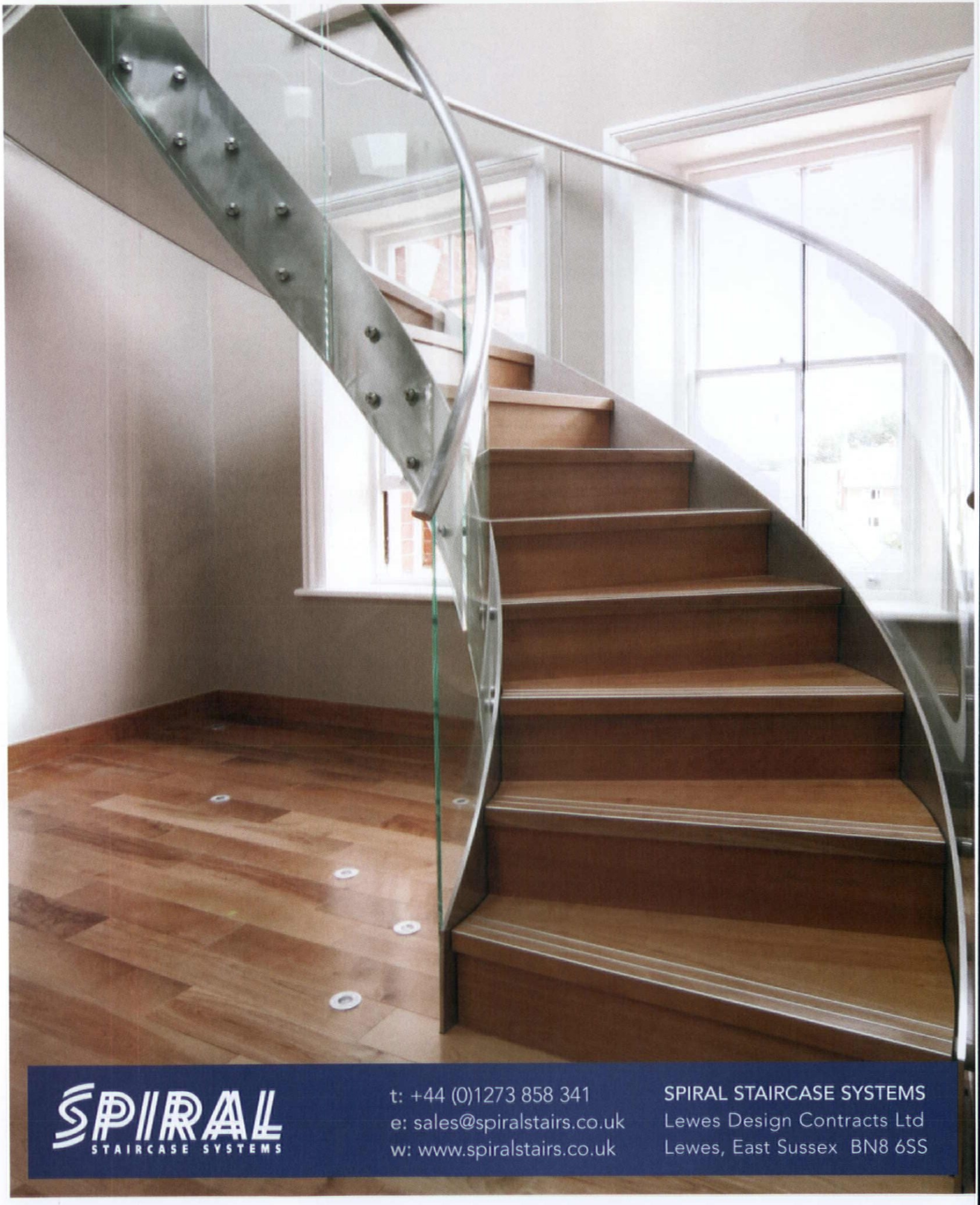
If the laws and constants of nature had been slightly different at the moment of the Big Bang, biological life could never have emerged, and we would not be here to think about it. Did a purposeful intelligence fine-tune the laws and constants in the beginning? Most leading cosmologists prefer to keep any hint of God out of the discussion and hypothesise that our universe is one of a vast number of parallel universes, all with different laws and constants. We just happen to exist in the one that has the right conditions for us. The problem is there is not a shred of evidence that these other universes exist.

Scientific materialism provided a seemingly simple, straightforward worldview in the late 19th century, but 21st-century science has left it far behind. Its promises have not been fulfilled, and its promissory notes have been devalued by hyperinflation.

In my new book *The Science Delusion* (Coronet), I turn the dogmas of materialist science into questions, and show that the sciences open up to all sorts of new possibilities when we stop pretending that we already know the answers.

The sciences of the future will be shaped by the recognition that natural, self-organising systems – including atoms, molecules, crystals, cells, organisms and societies of organisms – are processes rather than things. They are organisms, not machines. They are animate, not inanimate, with mental as well as physical aspects. The entire universe is like a developing organism.

Architecture inevitably reflects the worldview of the society in which it takes place, and a change in scientific worldview is bound to have far-ranging consequences. We face unprecedented problems that modern science and technology have themselves helped to create. As the sciences are liberated from the materialist ideology, who knows where they will lead, and where societies, economies and architecture will go?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View from...

CORBIS

Scenes of popular elation in Cairo marking the first anniversary of the Egyptian pro-democracy uprising in January

Cairo, Egypt

As Egypt advances towards democracy, opportunities open up for a more environmentally responsive architecture, observes *Khaled Asfour*

'Bread, freedom and social justice' was the slogan of Egypt's recent and still ongoing uprising. While freedom and justice are easily understood, bread is a big mystery. It not only implies the provision of daily sustenance, but also decent shelter, which many Egyptians still do not have. This is because there is nothing in national building codes and nothing in architectural practice that requires clients and architects to take environmental issues seriously.

Typically, external brick walls are 100mm thick with no insulation; glass panels are large and single-glazed; window frames are not airtight; and traditional wooden shutters that used to act as a protective layer on facades are no longer employed. So while a decent standard of living is first on the protesters' wish list, few professionals know how to achieve it.

Mamdouh Hamza, a leading engineer and a prominent activist in the uprising, has led the way in pushing for more environmentally responsive practice. This can be seen in the design of a new headquarters in Smart Village, Cairo, in which solar panels cool the building during seven months of the year. The system depends on water heated to 90°C by 2,000 square metres of solar panels on the roof. Hot water passes through absorption chillers in the basement, reducing its temperature to 7°C through chemical reaction. Chilled water is then pumped to all the floors to cool the interior. Double-glazed cladding panels with a low-emissivity coating and argon gas filler will reduce solar gain by 40 per cent compared with normal glass. Such measures, familiar enough in Europe, make the building a benchmark in Egyptian sustainable design.

Less dependent on high technology and more inspired by vernacular building techniques is Block 36 in Westown, Cairo, by Shahira Fahmy, another architect taking a stand against mediocre Egyptian architecture. The block is not the usual cramped condominium with flats stacked like sardines in a tin can. Instead, duplex apartments are arranged in an interlocking plan that creates interstitial terraces with dual aspects over the central courtyard and streets. During summer, the open terraces encourage air to penetrate the flats, reducing humidity and heat build-up. Rather than being mindlessly repetitive, facades are a variable sequence of solids and voids, making the building more responsive to climate and context. Outer walls are 400mm thick with extensions to neighbouring voids in the form of wooden screens to filter indirect light and protect privacy.

Emad Farid and Ramez Azmi are part of another group of architects who aim to reconceptualise traditional methods and materials for the modern age. Commissioned to design a hotel in the 800-year-old settlement of Shali in Siwa Oasis on the edge of the Sahara Desert, they renovated five historic houses to create 14 rooms round a courtyard. Methods and forms of construction replicate those of the surrounding citadel, and the Albabenshal Hotel has become a major tourist attraction because of its sense of authenticity and connectedness to place. Such integration encourages wider economic and social regeneration as local inhabitants set about renovating previously abandoned houses into cafés and shops for the tourist trade.

Successful examples of adaptive reuse encourage engagement with vernacular principles and underscore their unparalleled ecological and economic benefits. Yet when all this started by implanting a boutique hotel in a ruined historic cityscape, nobody imagined it could have a wider cultural resonance. Clearly Egypt's uprising is still in the making, but it presents the opportunity to transform built form and urban environments. However, it will require rebellious architects not just to protest in Tahrir Square but to set examples for the community to see, understand and then follow.

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Viewpoints

PETER COOK

Has the steady march of progress been detrimental to the art of drawing?

The parallel emotions of fascination and frustration infect the minds of many architects right now. The latter is an obvious result of today's economic woes, but the former is more complex.

For too long we have heard various takes on the 'end of Modernism', yet find ourselves falling back on its very foibles. It still holds a certain fascination, as does the exponential burst of digital wonders hold an even more breathless fascination. Just as, over the last 50 years, did the idea of the robot, the invincibility of concrete, the sheerness of plate-glass or the deviousness of certain French philosophers.

If we cynically (or in fear) wait for each one of them to move in or out of our way we remain pawns in their several games. So, what to do? We can retreat into the vegetable patch, the healthy country walk, the gloom of red wine, the endless reconstruction of a clapped-out little building in a semi-accessible location.

Or we can do a drawing. We can use this as a palliative, as an inspiration, as a daydream, or as an extension of our creative activity without the constraint of client, site, budget – or even materiality. Yet such an activity is under attack from a certain wing of the digital thought-police and still gets sniped at by the architectural theorists who sneer at anything that smacks of self-expression. The computer can lead us away into a new land of inevitability and logic, say the first group, following that with dark hints that any deviation from the true and consequential process is over-indulgent.

The set-up of the forthcoming Yale symposium entitled 'Is Drawing Dead?' (9–11 February) positions the old drawing-makers on 10 February and the digitals the day after.

Academics like artificial situations, since many of them have pulled out of the creative game. So a few of those of us who are heading for Yale will enjoy a certain muddying of the waters: just to make them uncomfortable? Or because we actually value the mandate of the drawing to delve, dream, speculate, manipulate, posit, doodle, or dart in an unexpected direction? One or two of us don't much care whether the drawing itself is covered in lead and sweat, caressed by layers of sedimented watercolour, is a partly Photoshopped manipulation, is caressed by the soothing characteristics of Maya, or dragged at extra speed through a printing machine.

As a teacher I found that the first generation of kids who chirped about their prowess on the computer (but were often eye-dead) were quickly overtaken by a second generation who did have talent, moving effortlessly from pencil to mouse and often back again.

I sit writing this on a train that runs across most of Denmark, from west to east. At one time this would have been unthinkable: since the various islands were once satisfied by their completeness and generated a breed of sailors who relished the heroism and craftsmanship of crossing the water. Now we simply glide along. At one time writing was for the study, travel was for the vessel. Now I simply flap down the table, flap open the laptop. I can look out of the window (are we now on Thule, or is it Zealand already?). The kaleidoscope of the visible overlays my train of thought. When I arrive in Copenhagen I will see an extraordinary exhibition of drawings by Lebbeus Woods, Peter Wilson, CJ Lim and others, honouring our sadly lost friend, Svein Tønsager.

Such an exhibition reminds me of the 1980s when many European towns had architecture galleries, where we celebrated ideas. You will note that I cite ideas, rather than draughtsmanship, though that will also be in evidence. The few remaining galleries seemed to have taken up a more rhetorical, programmatic stance, making it harder for the talented meanderer, the graphicate speculator to have a voice. Sandwiched between these two events lies a particular – and not so fragile – culture, waiting to be picked up, dusted and sent back into the mainstream of ideas.

'Spare us a pencil, guv.' Things might get worse, but paper is still cheap, if you're not too fussy. Little old shop premises are sitting empty in every city. Architects, young and old, have strange and unfolding ideas. Including deviant ideas. And someone can be sitting at a fold-up table while working on a thesis, just stopping the drawings from getting nicked.

Not such a bad idea? Could be a part of the Academy of the Future; but that one is for another day.

LAST WORDS

'Zaha Hadid emerged to an unfair commentary on her looks and person, but forged new ground in what a female architect might be.'

Flora Samuel writing in *The Architects' Journal*, 12 January

'Not a single person was willing to commute to the cities, even though they were a 40-minute drive away. Not long, but too long to get home for lunch.'

Jonathan Meades in *Radio Times* on French attitudes to work

'It's a very nice idea, but I wouldn't have thought West Bromwich was big enough to be a capital city. It's a bit pie in the sky for me.'

Sandwell mayor, Joyce Underhill in the *Birmingham Mail* responding to the AR's proposal to move Westminster to West Bromwich

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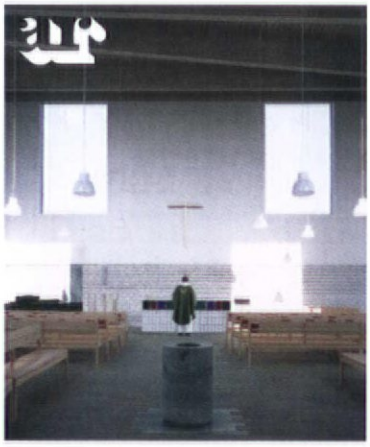

Gordon Murray defends Steven Holl's Glasgow proposals in the face of criticism from William JR Curtis

William JR Curtis on Mies van der Rohe (*Reputations*, AR December) was both incisive and illuminating. His sentence on Mies's understanding of materials opened new lines of thought; a wonderful writer. But it is unfortunate that this acuity appears flawed in his assessment of the Glasgow School of Art Campus and the resolution proposed by Steven Holl, by his undoubted love of Glasgow and CR Mackintosh (*Overview*, AR January). He highlights the dilemma of any ongoing critical appraisal of our historic estate. Rem Koolhaas focused on the issue at the last Venice Biennale in 2010. Always an acute observer of the future in the present, in the OMA room in the Italian Pavilion of the Giardini he suggests in his own polemic: 'The current moment has almost no idea how to negotiate the co-existence of radical change and radical stasis that is our future.'

In this vacuum, context becomes the means by which we evaluate the importance of a new building rather than in any critical assessment of its own impact and intrinsic merits. Mackintosh's building is undoubtedly world class. What is troubling is the argument presented to support or diminish the significance of any shift in context. Rafael Moneo in his 2003 acceptance speech on the occasion of his RIBA Gold Medal encapsulated the dilemma – his 'hand of poker' analogy – what comes after alters the meaning as much, if not more so, than what may have gone before. More significantly, that which came before is again altered in meaning. Thus context, serendipitous at best, becomes a difficult argument unless it is rooted in a real sense of place in both space and time.

Carrying that analogy through, the Mackintosh building has had a few duff hands dealt it, with the exception of the Newbery Building: one of Scotland's most elegant 'towers' from the 1960s and of greater merit than any other building on the north site including the Corner Building – the 'Vic' – whose demolition I supported. It has had its robustness challenged by a series of nondescript neighbours and has proved muscular enough. Its toughness probably even alarmed Corbusier – an essay itself. Its new neighbour, itself far from limp, should be absolved of any *lèse-majesté* at least until it enters maturity or until we all develop a new lexicon for a holistic assessment of setting, context and history as well as quality. Steven Holl has to deal with the future just as Mackintosh did.

Gordon Murray, Department of Architecture, University of Strathclyde

First thoughts on the Big Rethink

I found Peter Buchanan's first campaign essay (*The Big Rethink*, AR January) to be well written, understandable and illuminating. He definitely gave shape to my inarticulate reservations about Modernism in architecture. His observation that architecture today lacks something, 'less than a century ago we seemed to have no problem creating', is pertinent. The trouble is that most of it isn't beautiful enough, in the sense architecture (unlike a machine) should be. Yes, the best does respect the Vitruvian triad of *firmitas, commoditas* and *venustas* (or grace?) but the whole, the triangle, is not an equilateral one: the functional and structural sides being disproportionately longer than the aesthetic one. Why is this?

The problem may lie in our perception of the meaning of architecture, and the rarity of architectural talent. Architecture has a double meaning: meaning as logical structure, and meaning in the sense of significant form. The former is about logical relationships, which lend themselves to classification, systems analysis and computational power. The latter demands a more intuitive viewpoint, being about the signification, coherence and beauty of a particular form, what it gives to and takes away from a particular cultural context. Whereas meaning as logical structure requires a clear, logical mind, meaning as significant form requires talent, which is rare.

Star architects are variously talented, their abilities magnified by huge teams of assistants and consultants. They conform more to Shakespeare's triad of success in life: talent, luck and money. If you haven't got the complete triangle, you land up doing 'dull' work as a sole practitioner, or ironmongery schedules for a big name architect. And since 'acorns don't grow under oak trees', the potential pool of talent in the thousands-strong profession is whittled down to just an overworked few with 'glittering' careers. No wonder the star architects' work is inconsistent, and the nation as a whole is starved of a rich variety of architecture. We need to recognise and nurture talent, not bury it alive, if we are to rethink architecture and the design of the larger environment, in the nicely coined 'Third Industrial Revolution'.

Trevor Jones, Cambridge

The AR's 'Big Rethink' comes too late to have any really meaningful effect. Where Peter Buchanan's article has perhaps trumped similar offerings to other periodicals is in the severity and urgency of its tone and in the direct, albeit qualified, criticism of named practices; a dubious honour, but the author has probably only written what has already been said at dinner parties, cafés and lecture theatres over the past few years.

There is more to the malaise which afflicts architecture than the simple cult of the starchitect. Ultimately we must as architects and theorists admit our powerlessness in the face of larger forces. Modernism was the child of the industrial revolution,

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leading to an unprecedented break in the continuing evolution of craft techniques that had always underpinned architecture, but which had never been properly acknowledged. This meant that the technical and cultural failures of many of the products of Modernism were probably inevitable.

In Switzerland, Sergison Bates has just completed yet another 'cheap plain building with quiet unobtrusive dignity', the type which Buchanan has rightly identified as being tragically beyond the reach of most architects, but which Sergison Bates seems to have mastered. It says much about the current state of affairs in this country that practices like theirs seem more welcome on the continent than in the United Kingdom.

In the 1970s (when I was born) the unfashionable Robert and Brenda Vale carried out their autonomous house project and concluded that the continuing growth of cities (and the economic growth that underpins it) is not compatible with sustainable development. Increasingly, it's looking as if they were right, but few in the profession have really taken them seriously. Alas for the AR, Buchanan and others like them, because the horse bolted a long, long time ago.

Michael Badu, Michael Badu Architecture, London

I am glad you are launching a Big Rethink of architecture and the profession; however, I do not think it is fair to write that 'no other architectural publication is attempting anything similar'. Actually, in June 2010 we organised an international congress under the motto 'More for Less', featuring architects from five continents, and we released a book with interviews in depth of them all. In any case, congratulations for the magazine, which is one of the very few we pay attention to.

Luis Fernández-Galiano, Editor, *Architectura Viva*, Madrid

Peter Buchanan's assertion that the best design work today is coming not from 'starchitects' but rather from 'highly professional mainstream practices' strikes me as one of the most original insights of the article.

Patrick Winters, from AR website

Fantastic to start the new year with such a significant article. Without cultural evolution we are stuck in the pastiche world of matching existing Tweedledum and Tweedledee pseudo vernacular, funky facades and solar gadgetry blowing hot air. The public sector, which commissions 40 per cent of the work and gives consent to the rest, needs to be empowered and able to think more boldly about our cities and towns. We are more worried about the look of things rather than human welfare. Britain has some of the world's leading expertise and it is about time there was a cultural shift in our planning departments to use this talent so that we can evolve out of our heritage not into it.

Yasmin Shariff, from AR website

A wonderful piece that hits the nail on the head. It really is all about people and places and less about statements and ego. I sincerely look forward to the death of the 'starchitect'.

Darren Price, from AR website

Glad to read something reasonable about the future of architecture. For us lesser mortals, architecture is relatively rarely about 'making context', and much more about interpreting and enriching context. This is increasingly difficult, with tight budgets and constraints which rightly put energy efficiency at the forefront of the debate.

One issue needs highlighting though: there is not enough done about whole cost building rather than capital cost thinking. Maybe governments need to legislate more. In social housing, increased energy efficiency only interests the organisations when renters have less financial pressure on them from heating costs and so are more likely to pay on time. Construction financing that took into account the lifecycle cost reduction through improved performance seems a great way to relaunch the economy and start to deal with global warming.

Craig Comerford, from AR website

At last! A brilliant piece of independent writing, just what we want from our journals! I hope this heralds an exciting year for a new trail-blazing AR, as independent as is possible, and speaking for humanity, especially the rising tide of protest from the younger generations, and for the health of the planet.

Justin Bere, from AR website

Contretemps continued

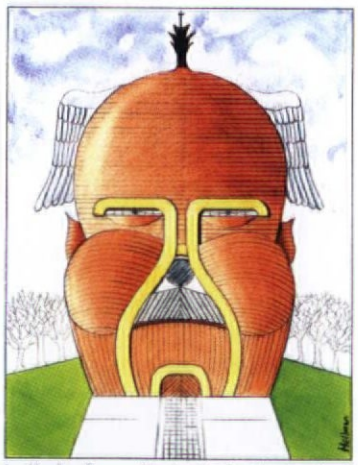
Beneath the subtle Australian humour of Joyce Malley's response to my November article on Hamonic + Masson's social-housing scheme (*Your Views*, December 2011) lurks a questionable premise. Her gripe is that she finds it too banal for inclusion in the magazine. But surely social housing has a duty to be banal to a certain extent? Don't the people applying for social-sector accommodation aspire to be housed just like everybody else? Should the AR never even occasionally stoop to consider this apparently uninteresting topic? Is Ms Malley pleading for an elitist publication that covers only the rarefied, the exclusive and the highly priced?

I suggest she visits the buildings to see for herself what effects the terraces have on sight lines, rather than relying on reading plans. Or she could look more closely at the photographs, since there's one that clearly shows how the corners of the terrace overhangs prevent views into the flats behind. The whole point of the wrap-around terraces (and *mea culpa* if this was not clear in the article) was that they offered a generosity – freedom of space, choice and movement – lacking in meanly dimensioned Existenzminimum social housing. I might also point out that Paris is not Siberia, and winters are pretty mild here (though obviously not as mild as in Sydney). Ms Malley's argument is tantamount to saying there's no point bothering with gardens in Paris as people won't use them so much in winter. (And what's that about a 'perv's paradise'? Does she think Parisians never bother to get dressed when at home?)

I don't claim Hamonic + Masson's scheme is perfect or that their design choices (or their client's programming choices) should not be called into question. But within the remit of social housing the architects did try to do something different, and covering their attempt contributes to an important debate that concerns all of us — how do we want to live?

Andrew Ayers, Paris

ARCHI-TÊTES



IMRE MAKOVECZ

Illustrating a point

I wonder if any of your readers noticed the remarkable resemblance between the drawing on page 95 of your last issue and my 1999 Archi-tête (above). Are they by any chance related?

Louis Hellman, London

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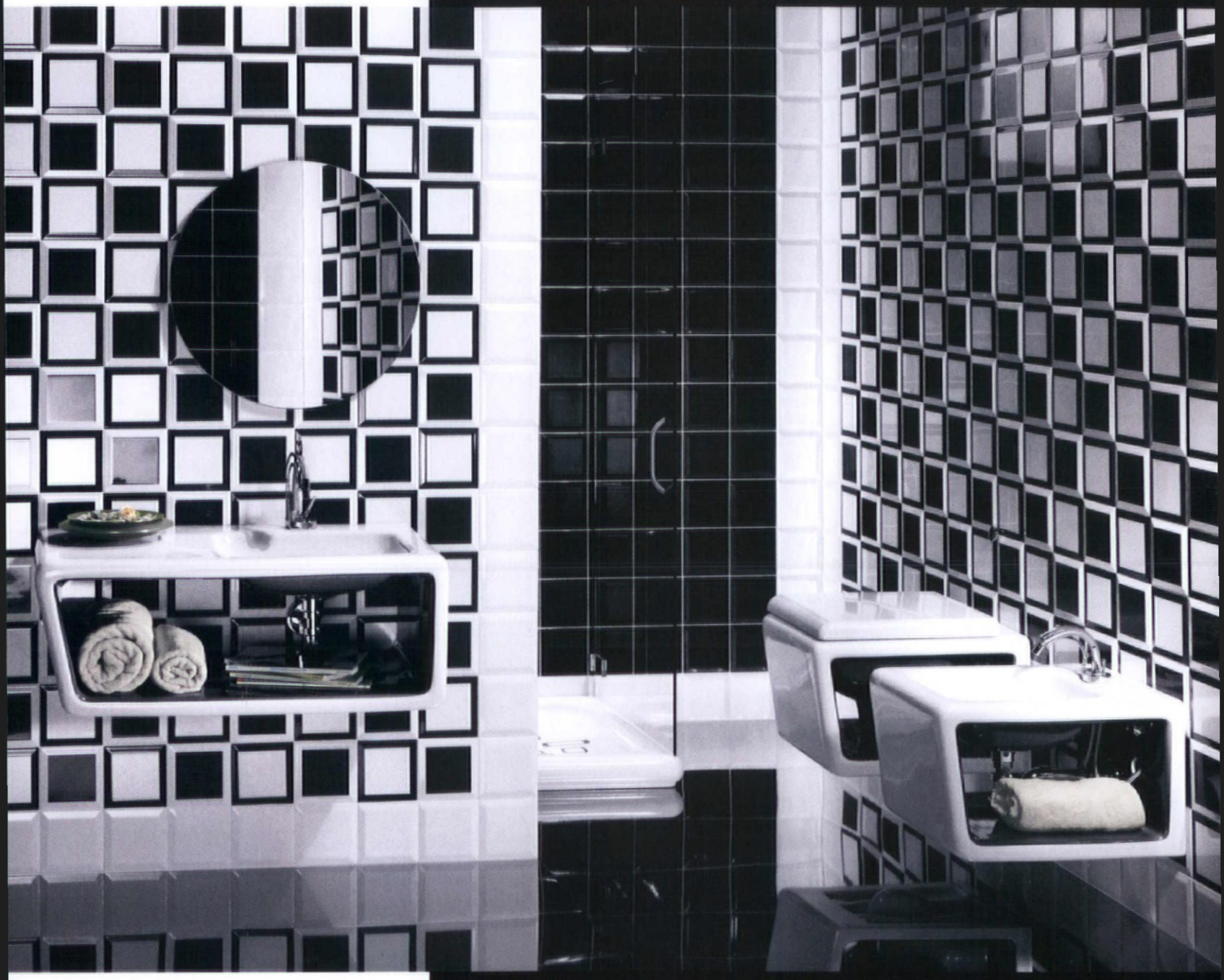

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1. (Opposite) built on the site of a former factory, the school mixes new and existing elements. A tall chimney, a remnant from the site's original industrial incarnation, presides over a new public space
2. Gold-tinted aluminium panels envelop the school's canteen and sports hall in a glamorous, gauzy veil. An existing metal-framed structure was too dilapidated to re-use and had to be demolished

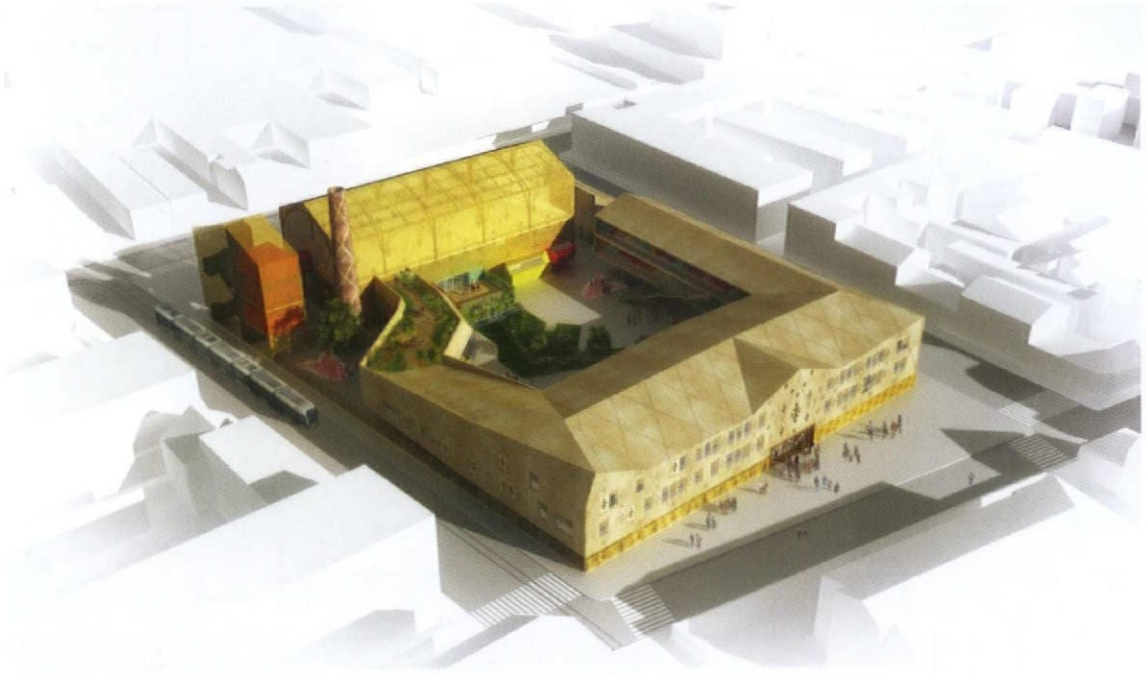
2

FRENCH TWIST

Emblematic of wider transformation in the grim flatlands north of Paris, a new school rises from the ashes of a former industrial site in Saint-Denis

Casarès-Doisneau School, Paris, France
AAVP

3



REPORT

ANDREW AYERS

Casarès-Doisneau School, Paris, France AAVP

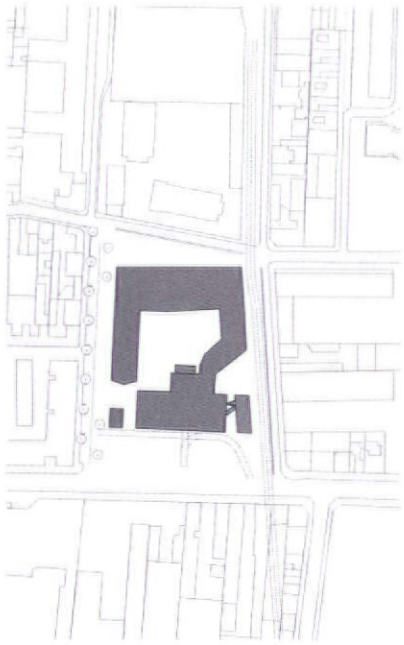
According to legend, Denis, the first bishop of Paris, picked up his head after it was chopped off on Montmartre (martyr's mount), trudged five kilometres northwards with it, collapsed, and was buried where he fell. His tomb begat an abbey, which later became the most powerful in the realm and necropolis to the kings of France. But the French Revolution put paid to all that and, following closely on its heels, the Industrial Revolution changed the region's topography forever. By the 20th century, Saint-Denis and its neighbouring *communes*, Aubervilliers and Saint-Ouen, had become one of the largest industrial sites in Europe. Particularly favourable for development, the flatlands of the Plaine Saint-Denis attracted migrant workers from far and wide, notably Spain, to the point at which the area straddling the Saint-Denis/Aubervilliers border was called 'La Petite Espagne'.

Today, while there are still Spaniards in Little Spain, the industries that attracted them have long since gone. Indeed the whole of the Plaine Saint-Denis is undergoing post-industrial redevelopment, its derelict factories making way for offices and its sub-standard housing being replaced by shiny new apartment blocks. The populations of Saint-Denis and Aubervilliers are growing fast, as is the number of children living there – a 21 per cent rise in 10 years. It is in this context that the Casarès-Doisneau school complex was built, on a former industrial site at the border of the two communes, with financing from both (a dual parentage seen in its name, given Aubervilliers already had a school with the title Robert Doisneau, which the building replaces, whereas Saint-Denis plumped for Maria Casarès, a Spanish Civil War refugee who achieved screen stardom in France). The programme called for classrooms and ancillary spaces for over 500 nursery- and primary-school pupils, as well as a sports hall for both the school and the local community. AAVP, headed by 42-year-old Vincent Parreira, was selected from 170 competition entrants.

Among the industrial edifices already on-site was a handsome 'Eiffel-type' metallic hall and a tall brick chimney. The intention was to retain both in memory of the area's working-class past, but while the chimney could be saved the hall proved too dilapidated for reuse. Nevertheless, it was decided that its volume should be replicated in the new building as a complement to the chimney, and that the area in front of it, formerly occupied by industrial structures, should be left clear in order to form a public space.

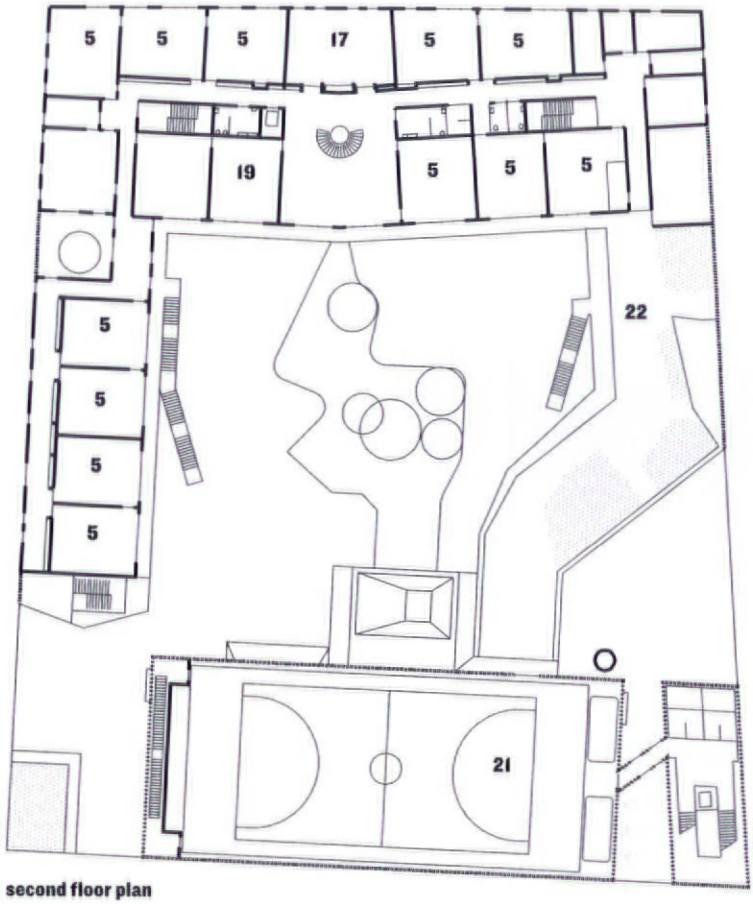
4

3. New elements wrap around the edge of the site, creating a sheltered central courtyard for use as a playground. Around the existing chimney, the buildings pull back to form a new public space
4. The landscaped playground at the heart of the complex. The school presents an impervious face to the street and opens up on to this generous central space

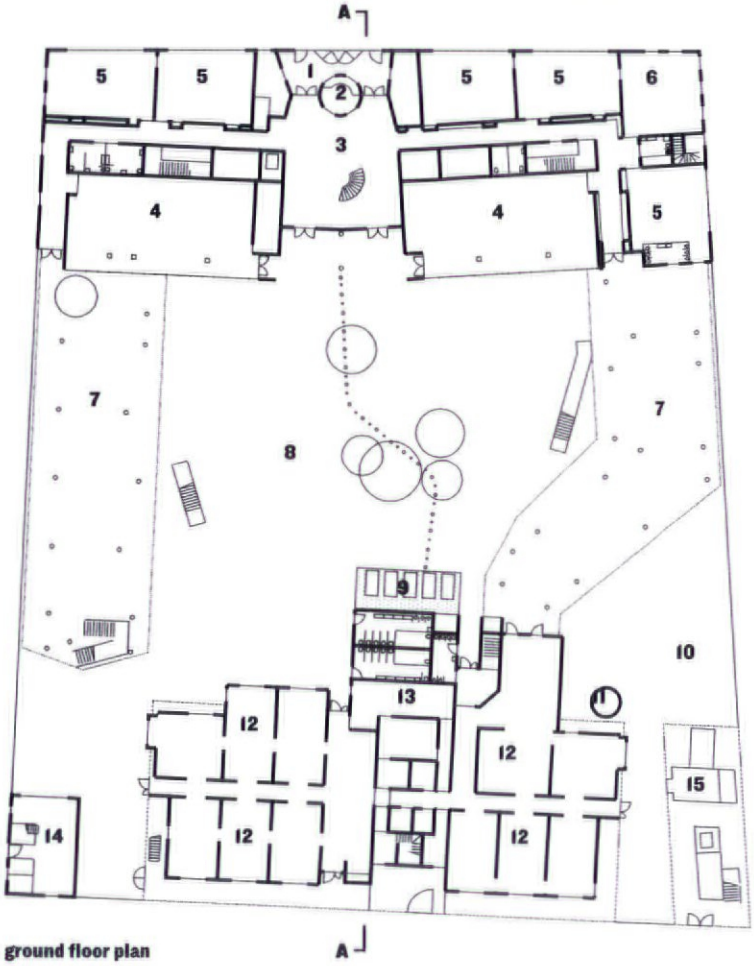


location plan

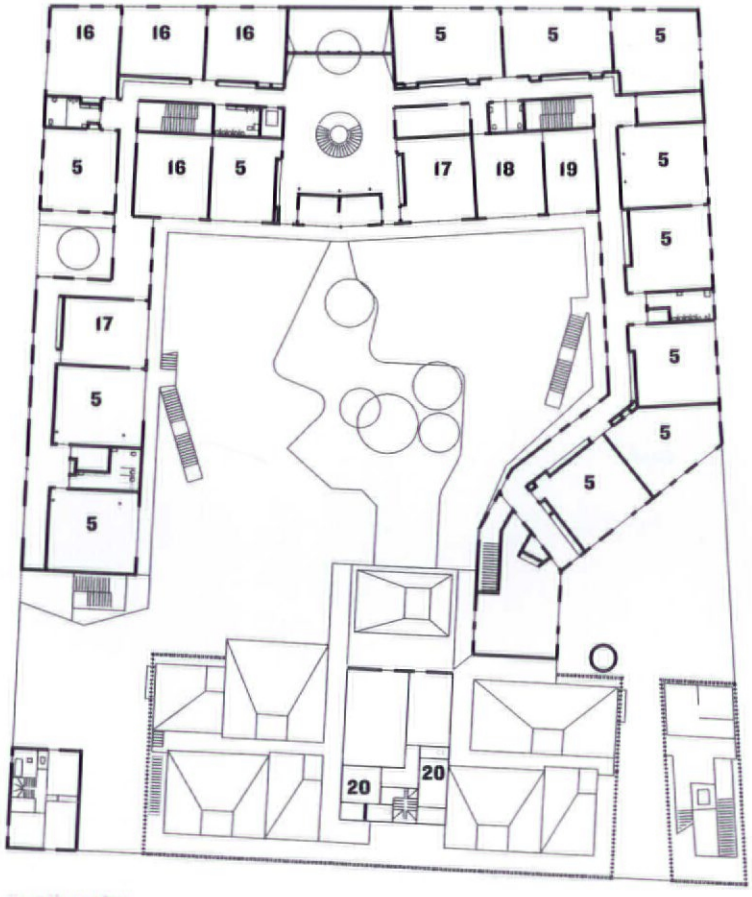
1 entrance forecourt
2 caretaker
3 entrance hall
4 group classroom
5 classroom
6 quiet room
7 undercroft
8 playground
9 garden
10 public space
11 chimney
12 dining room
13 kitchen/washing up
14 caretaker's house
15 service plant
16 activity room
17 multi-purpose room
18 staffroom
19 changing room
20 sports hall
21 roof terrace



second floor plan



ground floor plan



first floor plan

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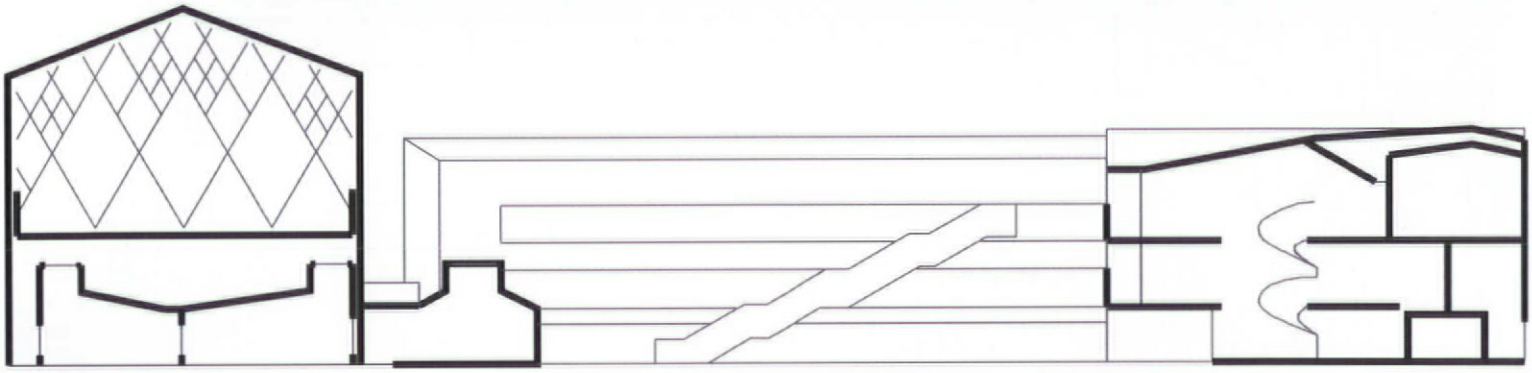


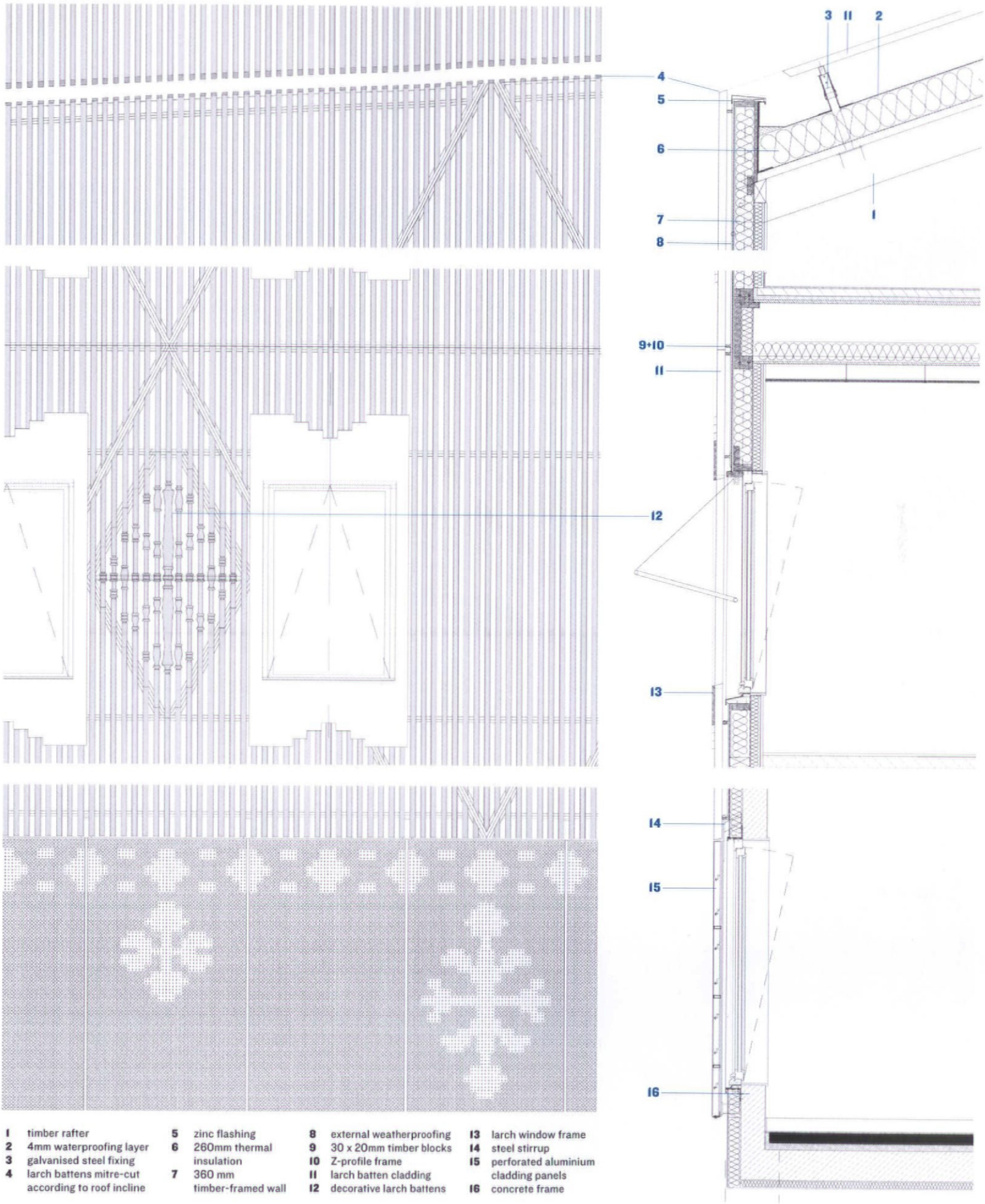
section AA

6

7

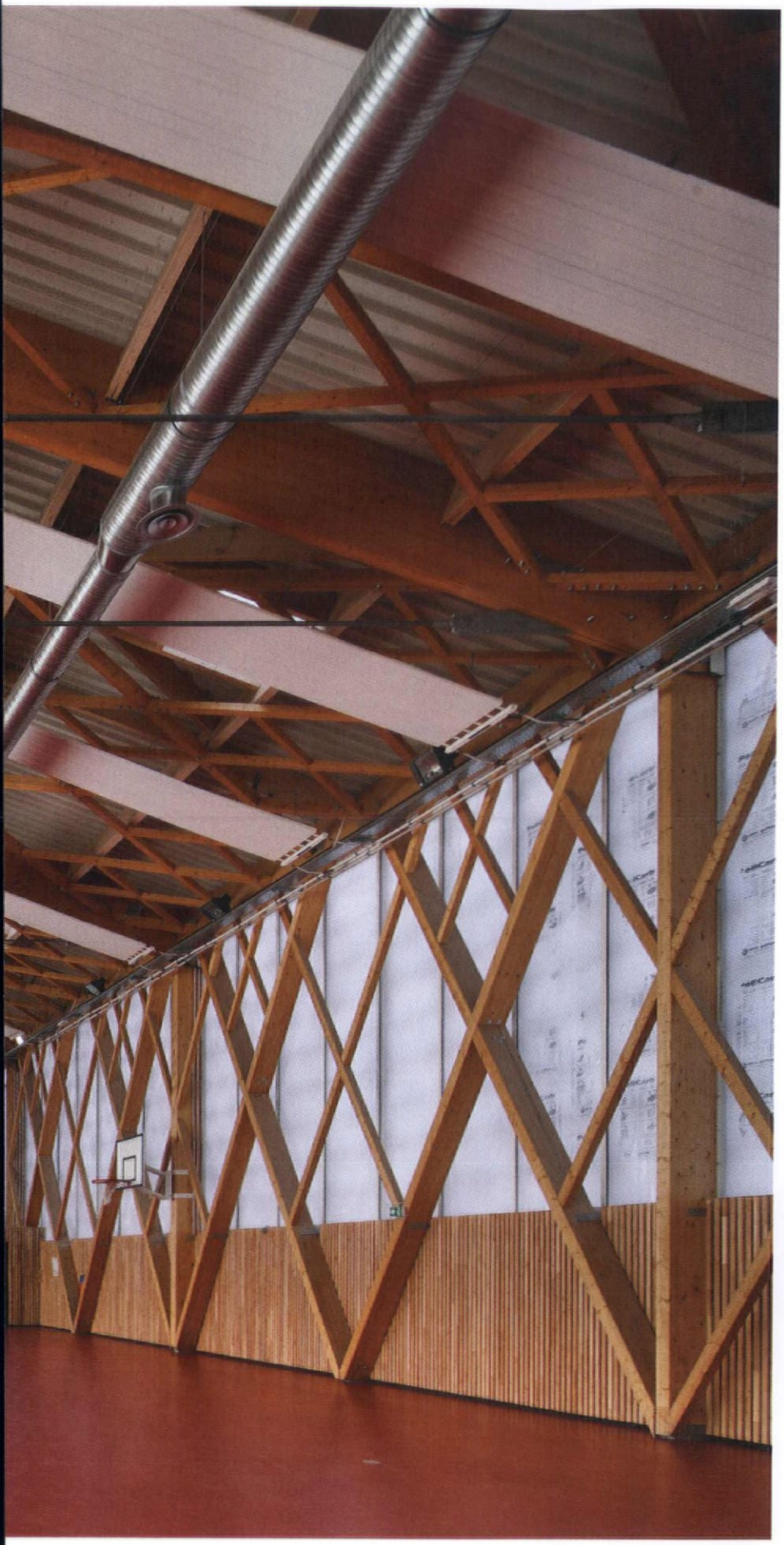
5. The main classroom block is wrapped in a slatted skin of pale larch with decorative motifs drawn from Jules Saulnier's famous Chocolaterie Menier
6 & 7. Comparative facades of the Menier building and classroom block display a kinship of ornament

Casarès-Doisneau School, Paris, France AAVP



1 timber rafter
2 4mm waterproofing layer
3 galvanised steel fixing
4 larch battens mitre-cut according to roof incline
5 zinc flashing
6 260mm thermal insulation
7 360 mm timber-framed wall
8 external weatherproofing
9 30 x 20mm timber blocks
10 Z-profile frame
11 larch batten cladding
12 decorative larch battens
13 larch window frame
14 steel stirrup
15 perforated aluminium cladding panels
16 concrete frame

8



9

10

8. The new school hall building contains dining spaces at ground level, with a sports hall above, expressively framed by diagonal glulam members. The pattern of the outer layer of aluminium mesh is subtly filtered through translucent polycarbonate cladding, like luminous wallpaper
9. The enfilade of dining rooms on the lower floor
10. A quasi-industrial staircase lined with ribbed metal cladding adds to an already varied palette of materials

Casarès-Doisneau School, Paris, France AAVP

It is this ensemble that greets visitors arriving along the main thoroughfare (the Rue du Landy).

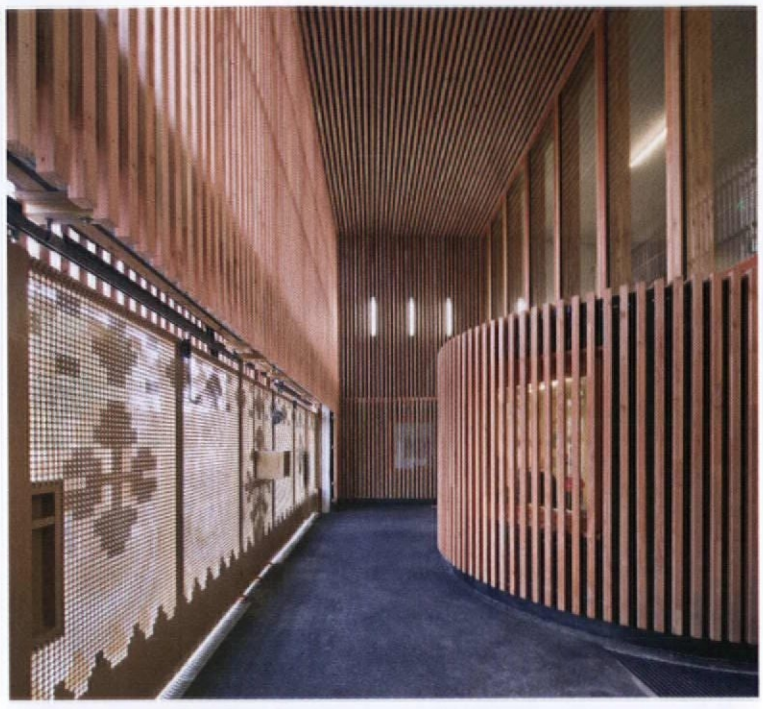
And what a greeting. Rising phoenix-like from the ashes of its predecessor, the new hall building dazzles the eye. Perforated, gold-tinted aluminium panels envelop it like an industrial-strength net curtain. Belying the simple geometry of the hall's volume, the patterned perforations add a wealth of decorative detailing, and for many casual observers evoke the moucharabies of Arab and Moorish architecture – an ingenious way, in this paedophile-conscious age, of creating a vocabulary of veiling and protection without evoking incarceration.

On closer inspection, the patterns' provenance turns out to be rather closer to home, since the perforations trace out giant diagonal crosses – which recall the bracing members of 19th-century iron structures – and decorative motifs derived from polychrome brickwork. This is a direct reference to Jules Saulnier's magnificent 1872 iron-and-brick mill building at the Chocolaterie Menier in Noisiel (to the east of Paris), conceived as a giant oriental carpet and translated here into metallic lace. As for the restored chimney, it has been tied in visually through the application of criss-crossing gold ribbons.

On its concrete-framed ground floor, the new hall building contains the school canteens, while rising above them is the wooden-framed sports hall. This dual system of concrete ground floors and wood-framed upper storeys was used almost throughout the school in a spirit of sustainable development, what the French call 'construction douce'. Inside, the sports hall reproduces a Saulnier-type structure in glulam members, and is walled with high-performance polycarbonate sheets that keep heat in while allowing light through – but not too much, since it is filtered by the external perforated panels. The panels in turn imprint their shadow on the polycarbonate, producing an effect of luminous wallpaper. Changing rooms and technical areas are housed in an adjacent metallic structure linked by flying ducts and a 'factory' footbridge.

> 'Patterned perforations add a wealth of decorative detailing'

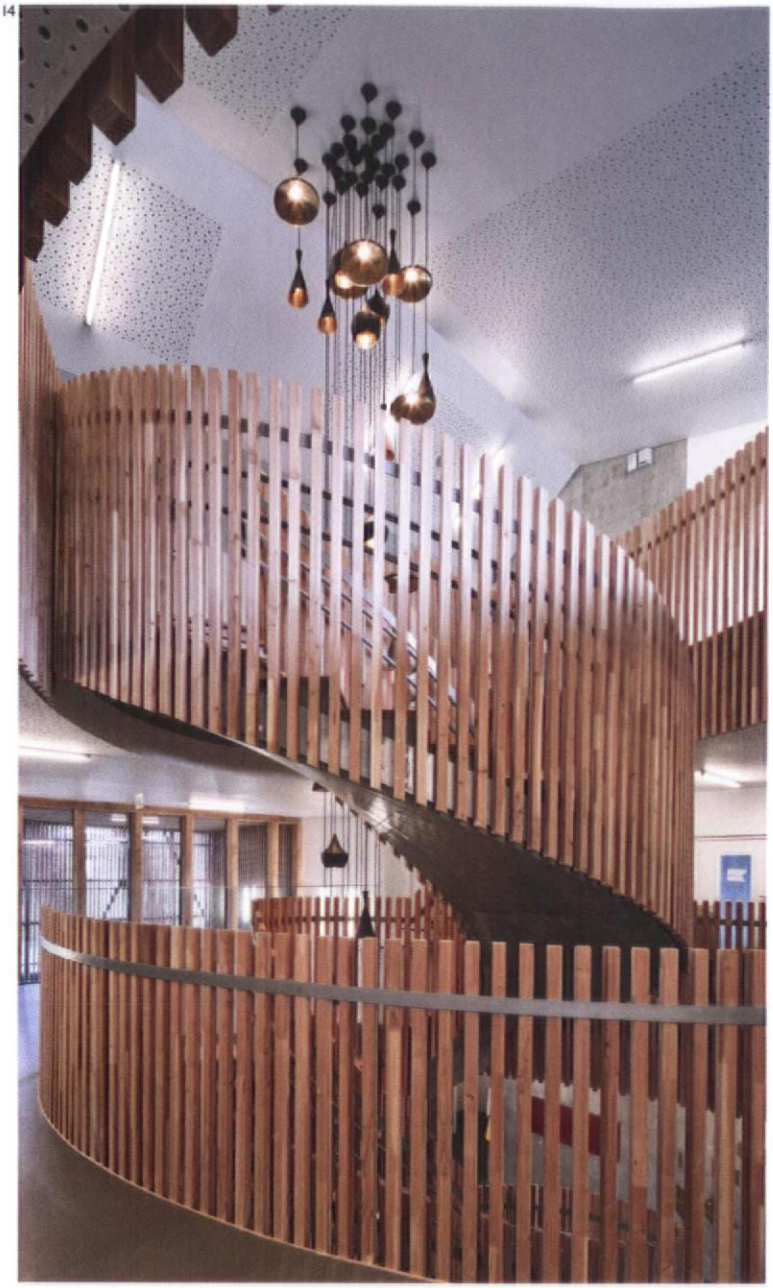
In France there is a tradition of designing urban schools as street-line-respecting buildings enclosing an internal courtyard (the playground), and the Casarès-Doisneau complex is no exception, bar a kink in the eastern flank in deference to the restored chimney. In this way the complex can be relatively closed to the outside world (in the interests of child protection) while opening fully onto the central space. The architects chose to place the main school



Casarès-Doisneau School, Paris, France
AAVP

I1. A system of timber walkways and staircases connects classrooms with the central courtyard
I2. Part of the main entrance hall
I3. The mesh veils resemble metallic lace

14

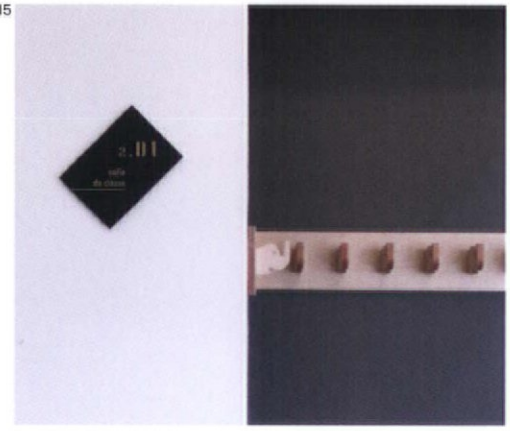


entrance to the north, on the quieter Rue Cristino Garcia, meaning less traffic danger and allowing the principal classroom wing to take advantage of the southerly sun on its courtyard side. Although the sports hall's perforated metal panels are continued all along the ground floor of the classroom buildings, their upper storeys have received a different treatment: their wooden structure is echoed externally by larch battens, cut in situ to evoke cross-shaped braces, and decorated with turned-wood lozenges and distinctively detailed window covers and surrounds. While to many these evoke Alpine chalets, they were in fact derived from brickwork patterns and also from moucharabies and wooden mosque screens, presumably in a nod to Spain's Moorish past and Saint-Denis's large Maghrebi population. The architects have chosen to leave the larch untreated, meaning that the most exposed parts will soon weather to a silvery grey.

A gable and a cartoonish metal tricolore signal the main entrance, hidden behind perforated panels and slatting. Beyond the porch, a generous entrance hall greets visitors and perpetuates the French tradition of the *escalier d'honneur* with a spiral decked out in Tom Dixon lamps and protected by wooden slatting for thematic continuity. Classrooms are simple, white and generously day-lit, whereas corridors are strongly coloured and double up as coat racks (observe the elephant-head coat hooks). But pristine as the corridors and the concrete stairwells appear, they are not too proud for children's artworks, which look rather splendid when tacked on to their walls. The courtyard-side classrooms give on to timber-slatted walkways that provide sun shading and rain protection, and are connected to the playground by external wooden staircases. Unadorned larch slatting dominates the courtyard, and proves handy for fencing off a central green area (there's another on the roof). It continues on to the buildings' undersides, where they are lifted up on pilotis to form *préaux* (covered outdoor play areas traditional in French schools).

In photographs, the Casarès-Doisneau complex might, with its whiff of the Wendy House, appear uncomfortably kitsch to some eyes. But in its current context of crumbling post-industrialism, it brings a welcome breath of freshness and complex-free *joie de vivre*. Once its wood has weathered and its context has been entirely rebuilt, its future livery of silver and gold should hold its own against almost anything that might be thrown up around it. This is a school that appears friendly to young children without resorting to a rainbow-coloured paint job, and that has been designed to take a few knocks – pupils have already begun carving their names into Casarès-Doisneau's timbers, much to Vincent Parreira's delight.

15



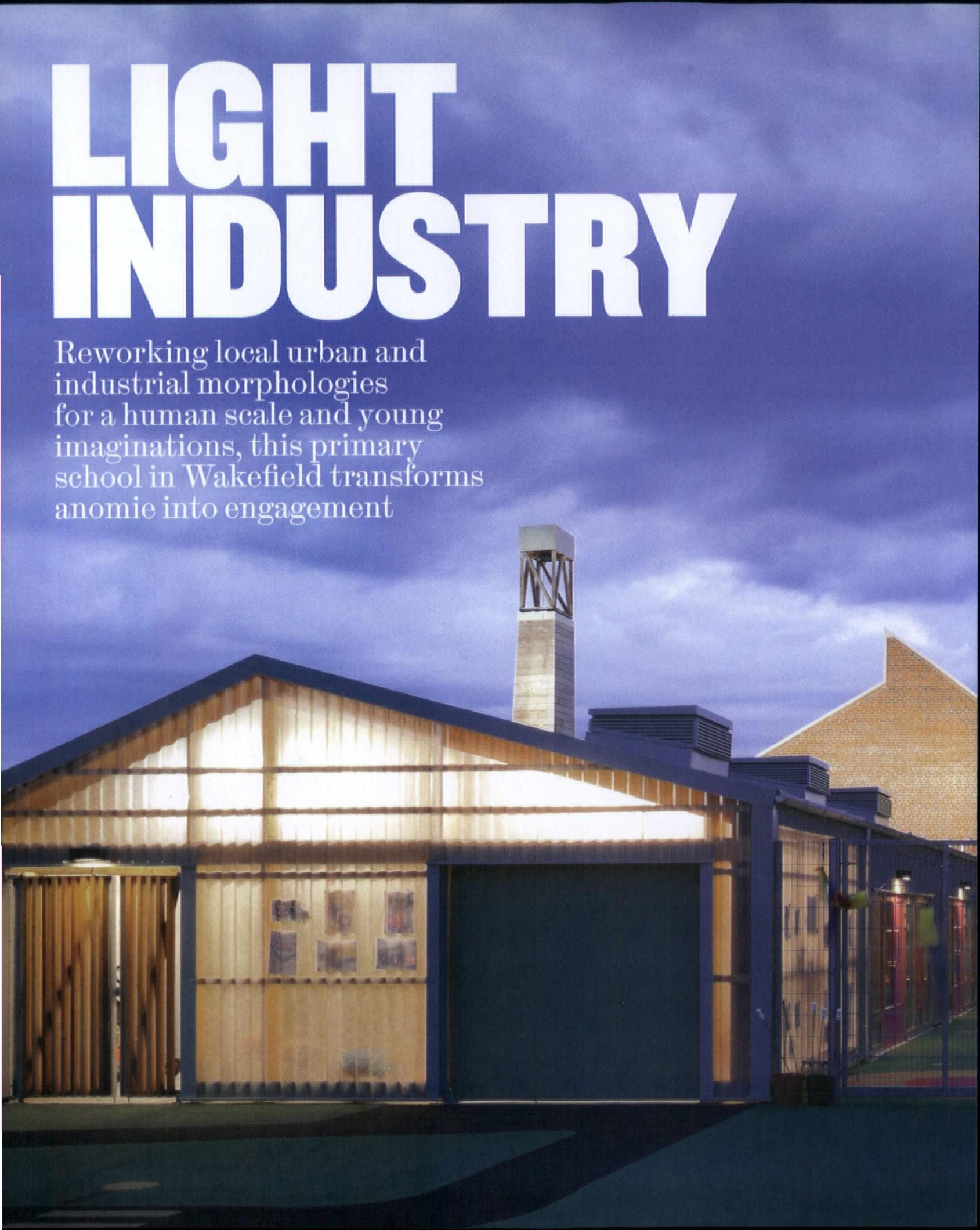
16

14. A spiral staircase forms a sculptural set piece in the entrance hall
15. Detail of elephant coat hooks
16. Bold colour animates the interior and helps to orientate pupils, staff and visitors

Architect
Atelier Architecture
Vincent Parreira
Photographs
Luc Boegly

LIGHT INDUSTRY

Reworking local urban and industrial morphologies for a human scale and young imaginations, this primary school in Wakefield transforms anomie into engagement



Sandal Magna Community Primary School, Wakefield, UK
Sarah Wigglesworth Architects

REPORT

GILLIAN HORN

With a change of government in the UK last year came a significant change in attitude to design and, specifically, to the design of schools. Finding political distance from the (albeit relatively) pro-design Labour position that the Tony Blair years established coincided neatly with the back to basics, there-was-nothing-wrong-with-my-chalk-and-talk-education stance of the Conservatives. Almost overnight the school-building bubble burst, with aspirations cut even deeper than the funding of the transformational new schools programme.

And so it is that already, after only a year of standing, the Sandal Magna Community Primary School feels redolent of another, bygone era. For this small, provincial one-form-entry primary school for 236 local three- to 11-year-olds wears design ambition on its sleeve.

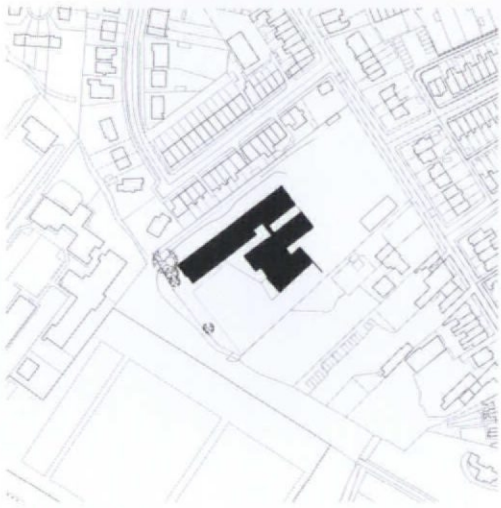
Sandal is a quiet residential neighbourhood that lies south-east of Wakefield city centre in West Yorkshire, a short walk through the old mine workers' cottages, warehouses and factory sheds to the major new art gallery, the Hepworth (AR July 2011). The primary school serves the community that developed in the 19th century to the east of the original Sandal Castle settlement, which now includes Pakistani and more recent Eastern European migrants. A couple of streets away, two end-of-row terraced cottages have been neatly converted into a mosque. Sandal Magna has replaced the Victorian board school that had opened 120 years earlier.

Thinking of the stolid grandeur of board schools, we readily get a sense of the moral and educational attitudes behind them – a belief in light and air, with lofty bright classroom spaces; of focusing minds on the 'master' teacher imparting knowledge of the world from the front of the class, with no low-level windows to distract pupils' concentration from the oratory; and of the importance of fresh air and exercise with access to grounds to run around but not to learn in. While applauding these attitudes to space and light, approaches to learning have opened up to take in a far wider range of possible learning experiences with the recognition that children learn all the time, not just when being instructed. The head teacher, and driving force behind this project by all accounts, Julia Simpson, was very much in favour of replacing the Victorian building, finding the large classroom spaces over-scaled and restrictive; cut off from the outside, and lacking in intimacy and warmth.

The Victorian schools were proud emblems of the new social institutions that entered and structured our communities during an era of industrial reform. An equal pride and vigour emerged in the post-war years with the creation of the welfare state and the leaner Modernist structures that were built for it. Now we not only expect these services as a right, but we recoil from their institutional aspects that can eclipse the core mission of the service itself. We do not like to feel intimidated and done-to by 'authority'. We no longer trust it, in the case of local authorities in particular. Instead we seek openness, identity, recognition, tolerance, flexibility and comfort from our institutions, all of which can be reflected and enhanced, or overlooked and dismissed in the buildings that house them.

The Sandal Magna strives to shed authoritarian notions of the school as separate from, and better than, the community it serves, to be a place within and for the community. The architecture is a humane response to the aspirations of a school and the needs of the community. You feel it as soon as you walk into the reception in which none of the senses suggest that you have stepped into institutional, or alienating, territory. The materials, the light, the scale, the view and the smell all invite you.

The world you are welcomed into is one full of invitation and narrative, and the invitation for narrative; potent devices in a primary school. The stories start right here in the centre of the school, where a timber-clad tower rises at a slight but discernible angle out of the reception area, through the painted timber-boarded ceiling and high up above the single-storey school buildings. This is an elegant reinterpretation of Wakefield's industrial chimneys as a bell-tower housing the refurbished old school bell that is still



location plan

2

3

4

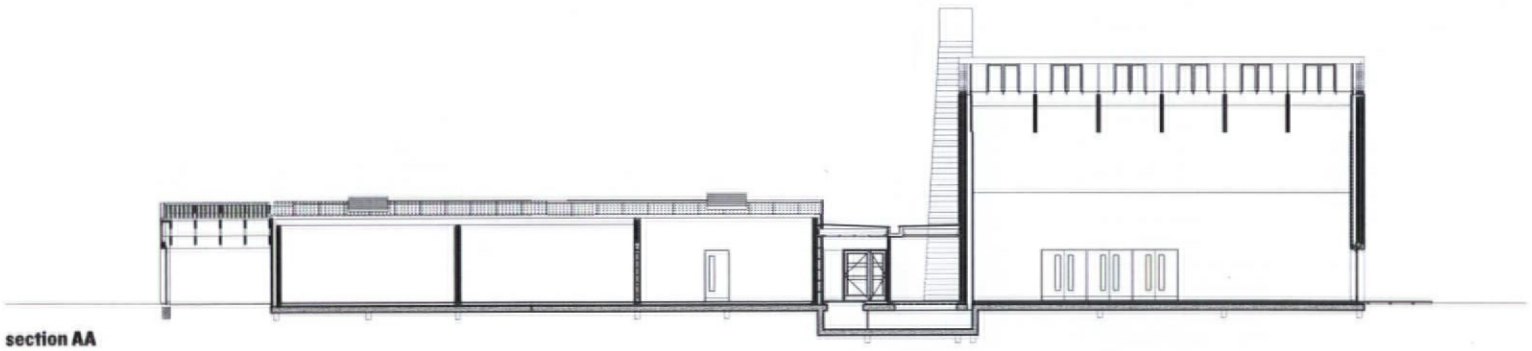
5

Sandal Magna Community Primary School, Wakefield, UK
Sarah Wigglesworth Architects

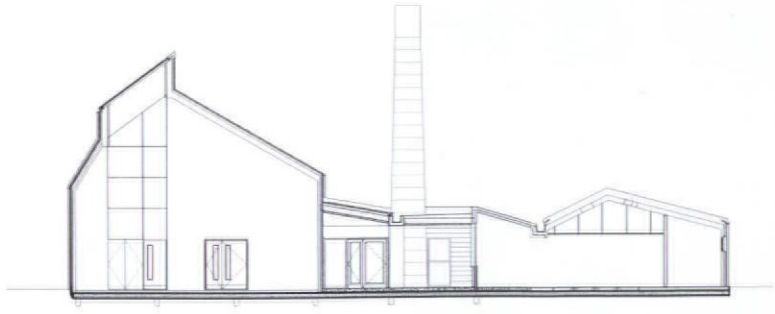
6

1. (Previous page) fluidly planned, humanely scaled and inviting, Sandal Magna aims to dispel notions of educational authoritarianism
2. Unlike its more stolid and homogeneous Victorian predecessors, Sandal Magna's tripartite cluster of low, linear elements spreads around its site. Recalling Wakefield's industrial chimneys, a timber-clad campanile anchors the composition in the landscape
3. Low timber bleachers run along one edge of the playground, providing a softer surface for games
4. Courtyard spaces form enclaves for play and costume dramas
5 & 6. Cross walls of the linear blocks are composed of red fair-faced brick. Subtle textural bonding variations break up the mass of wall planes

7



section AA



section BB

Sandal Magna Community Primary School, Wakefield, UK
Sarah Wigglesworth Architects

8

7. A timber-decked 'backstreet' runs along the edge of the playground. Variously articulated timber facades reflect the internal programme
8. Factory-like rooflights scoop light down into the tall volume of the sports and assembly hall

used every morning, pulled from a fluffy rope end in reception.

The plan too finds its narrative structure in the historical context of the place, from the surrounding street typology of 'fronts' and 'backs' found in the rows of coal miners' terraced housing. Classrooms are conceived as the house 'fronts', opening directly on to external learning areas and their 'backs' opening on to a corridor (internal street) lined with the ancillary support spaces (group rooms, pupils' kitchen area, stores, IT area and library) that visually animate the 'backstreet' to the main playground through their articulated timber facades that change in treatment and rhythm in accordance with the internal programme. And in one literal moment of the narrative interpretation, a timber garden storage shed nestles within the facade.

The obvious question at this point in the story is how far do you have to take a typology and how persistent do you have to be in its pursuit to create a rich and meaningful environment? In Wigglesworth's work the tension between the conceptual and pragmatic is often laid bare, perhaps because a focus on resolution could risk compromise. But if the story is strong and enthralling one longs for the rhetoric to stop and resolution to be gained through filtering and editing.

The street trope continues throughout the school, both internally and externally, with strips of hard landscape splitting the layout

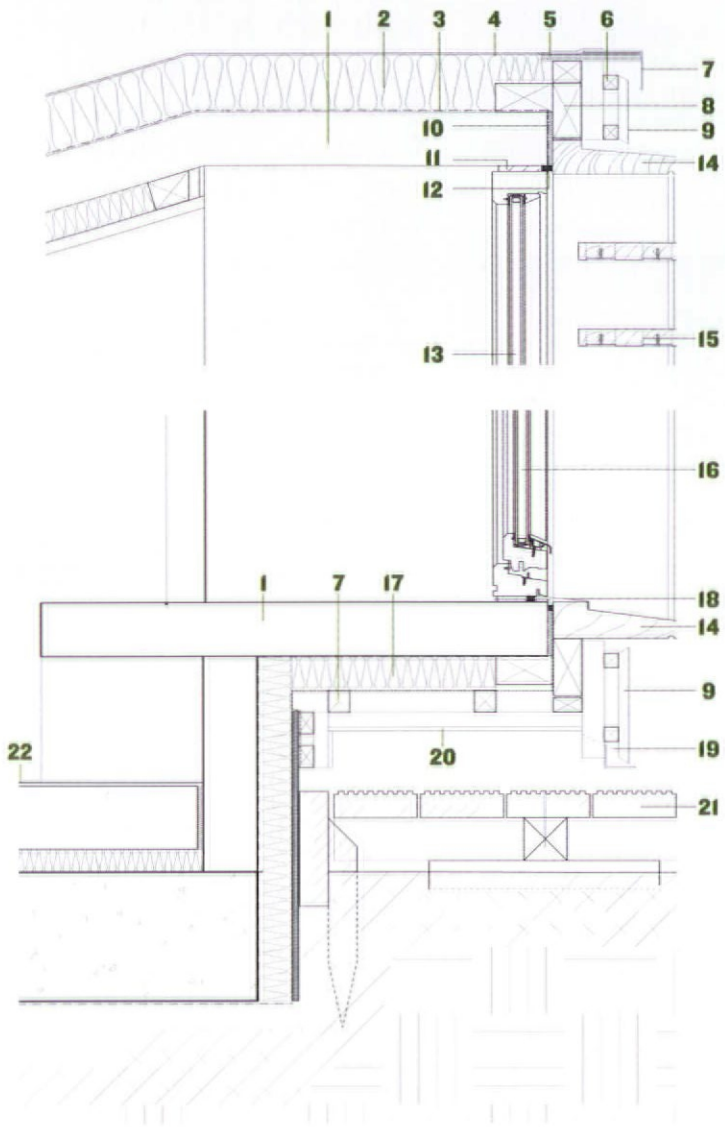
'The plan finds its narrative structure in the historical context of the place, from the surrounding street typology found in the rows of coal miners' terraced housing'

into three distinct bands of building, connected via an internal cross street that incorporates the entrance reception area. This linear plan has its grain perpendicular to the street from which you enter the site, along one of the paved landscape strips. This gives the rooms a roughly north-south orientation that is ideal for solar control. It also creates a high surface-to-volume ratio that seems anomalous with the low-energy sustainable design philosophy of the school but is offset by the ground-source heat pump, giving a low calculated carbon footprint for space heating of 3kg CO_2 per square metre.

The narrative continues through the material expression in the building. The cross walls to the linear blocks are all fair-faced red stock brick that are the closest match Wigglesworth could find to the existing school bricks. Some of these old bricks are used in the low gabion retaining walls on the

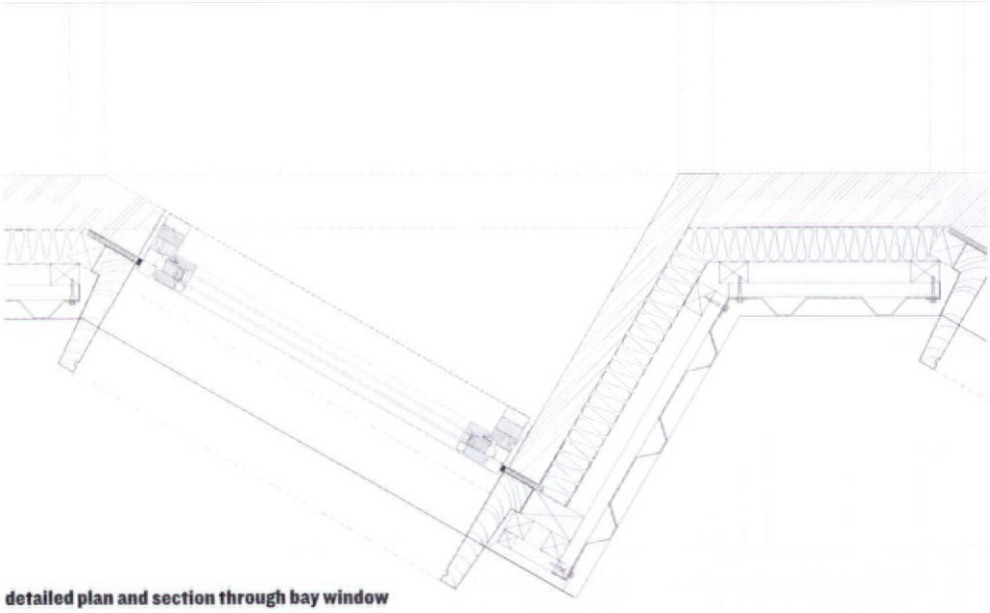
ground floor plan

1 entrance
2 reception
3 hall
4 head's office
5 meeting room
6 staff utility
7 community room
8 staff room
9 kitchen
10 play area
11 parents' room
12 covered play area
13 classroom
14 group room
15 computer suite
16 library
17 internal street



9

1 cross laminated timber
2 100mm insulation
3 vapour barrier
4 roofing membrane
5 ply support
6 softwood battens
7 aluminium edge trim
8 50 x 100 softwood framing
9 18mm mitred edge cedar board
10 10mm insulation
11 planed timber packer
12 10mm silicone sealant
13 fixed window
14 cedar window board reveals
15 cedar slats to form louvres
16 openable window
17 60mm insulation
18 aluminium flashing
19 insect mesh
20 sheet cladding
21 external decking
22 rubber tile flooring



detailed plan and section through bay window

Sandal Magna Community Primary School, Wakefield, UK
Sarah Wigglesworth Architects

north-west classroom wing, where the site begins to drop – Sandal can be seen inscribed in some of the coping bricks on top of this wall, a moment of thoughtful detail that keeps the thread of the history on the site possible.

The predominance of brick within the building has a marked and grounding effect upon the school. The use of brick also brings thermal mass that helps to stabilise temperatures and in the very fine hall, the beautiful perforated bonding pattern of the higher level brickwork provides acoustic dampening. The brick is complemented by the bare cross of laminated timber that spans between the heavy cross walls, forming the northern pitch to the classrooms.

With the street typology creating structure to the building and materials bringing texture and warmth, it is light that brings the whole to life. Contrasting qualities of light add character to different spaces in the school and set apart the 'special' places such as the hall, dining and library areas. The classrooms are all north-facing and not all as well-lit as they could be, requiring artificial light even on a bright sunny day, which compromises the carbon target (19kg per square metre for electricity). However, the animation of the 'backstreet' corridor through the south-facing rooflights along its length creates a positive contrast. There are hints of the Victorian legacy in the neutral regular lighting of the classrooms, separated from the bright distractions of display pinboards, specialist activity and withdrawal spaces.

The library is a delight among these. Not much more than a bay off the corridor, its rhythm and tempo set it apart. Full-height triangular bays articulate the playground wall, creating a string of low-level window seats to the long edge of the room. A simple shelving system for books makes up the dividing partition to the corridor, introducing another scale and texture. There is a poem by a pupil, written in exquisite handwriting and framed on the library wall. One passage reads:

> 'I can see the children playing outside.
> There are seats near the window and
> there are different shapes and sizes.
> There are lots of books I like to read.
> I can see pictures in my mind about
> the stories I read.'

And it concludes: 'Without the library I wouldn't be writing this poem.'

These simple observations tell of much of the pleasure, and success, of this school. Reminiscent of the best of the Hampshire Schools lineage, it is through attention to scale and detail, to character and place, that the building invites enquiry and engagement from its users, just as a good book does from its readers. As the general feeling of the internal spaces is domestic, so the exterior evokes workshops and factories. The whole adds up to an artful composition that romantically reinterprets the typologies of peripheral urban settlements to create a secure and nourishing environment that is both familiar and distinctive.

11

10

9. Projecting window bays are appropriated for gossip and relaxing. Polycarbonate walls are both tough and translucent; materials generally have a dignity and robustness and are thoughtfully applied and combined
10. Classrooms are linked by a long, luminous internal street
11. Typical classroom

Architect
Sarah Wigglesworth Architects
Photographs
Mark Hadden

2

LANGUAGE LESSONS

Spa School, London, UK
Agents of Change

Brentwood School, Essex, UK
Cottrell & Vermeulen

In stitching together disparate school campuses, these two additions reinterpret a London idiom to reaffirm the facade's urban significance and the lost art of ornament

CRITICISM

CANY ASH AND ROBERT SAKULA

It's strange how you wait for ages for a thoughtfully ornamented new building, and then two decorated schools come along at the same time. Consideration of these projects by two highly regarded London practices reveals some interesting trends in current attitudes towards the importance of context, the uses of architectural history, and the desire for an appropriately weighty design response to place.

Spa School

Spa School is designed for autistic children in inner-city Bermondsey, within sight of, but seemingly a million miles away from, the towers of the City of London. The area has an established urbanism of 19th-century terraced housing, although there is also a significant amount of 1970s infill nearby the school. Spa is a typical Victorian board school, all multi-colour brick, big windows and repeated gables. Five years ago, the far end of its site acquired a lumpy sports hall and it is in the gap between the main school and the hall that the practice Agents of Change (AOC) located its building.

Clearly they looked hard at the gables and windows of the existing school, at the vaulted roof of the sports centre, and at the roof forms and refractory brick of the 1970s housing across the road. They condensed all these into a single composition of three different gables, which wears its mixed ancestry with an assertive insouciance. Not for it the more diffident etiquette of the main school's street elevation. It is modern, the new thing, and it knows it. We shall return to this elevation, but first let's take a look at the riffs around the back the building. Two different species of brick pointing, separated by a vertical joint on the line of the main entrance, with black windows on one side and white on the other. Further along, to yet another rhythm, the facade also cants in plan. There are clear architectural intentions here, although in execution they exhibit an unintended jitteriness.

Inside, the main stair skewers the centre of the plan, with six spacious classrooms around it on two floors, the upper ones making ingenious use of various roof geometries. A primary ambition for the project has been to achieve really good classrooms, a simple aim, but one too rarely realised in many of the schools constructed with the British government's Building Schools for the Future (BSF) programme over the past few years. This ambition, arguably, has been achieved, but some of the building's other subtleties have not survived the design and build procurement regime unscathed.

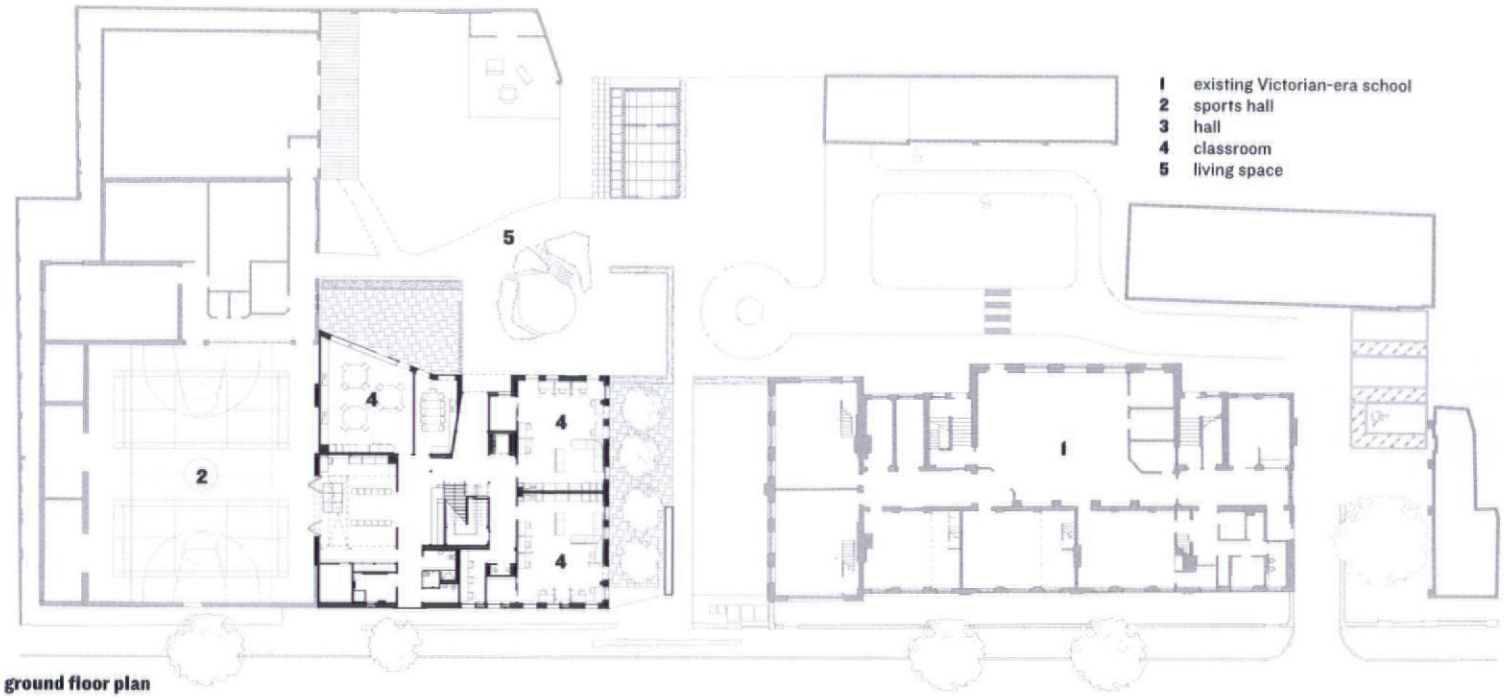
The street elevation is about more than just gables, and there is a concerted foray into the difficult territory of applied decoration in the form of slightly recessed brick crosses arranged in a lozenge pattern, and with

3

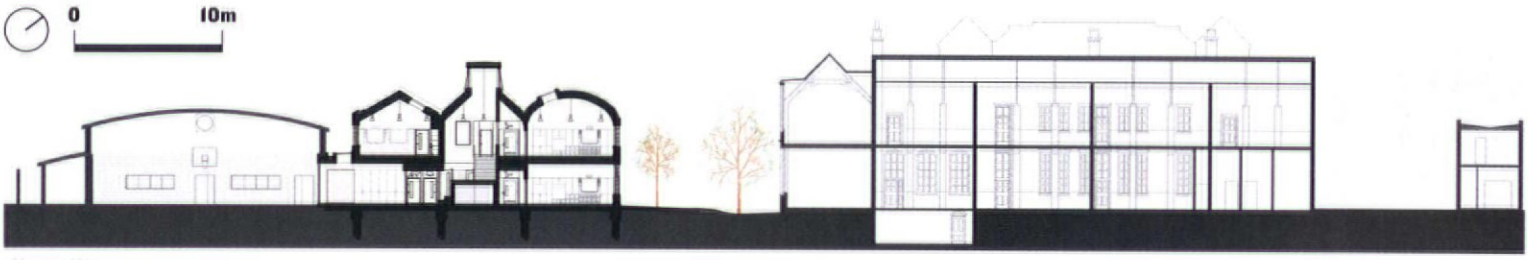
4

5

1 & 2. (Previous page) both schools are thoughtful exercises in brick polychromy, which uplifts their urban surroundings and anchors each institution within its community
3. Spa School's varied gable geometries are a slightly insouciant take on the more stern composition of the Victorian board school that still occupies the site
4. A central double-height space unites classrooms and a sports hall
5. Uplifting polychromy is not confined to the outside
6. Typical classroom at upper level under the barrel-vaulted roof



ground floor plan



site section

south east elevation

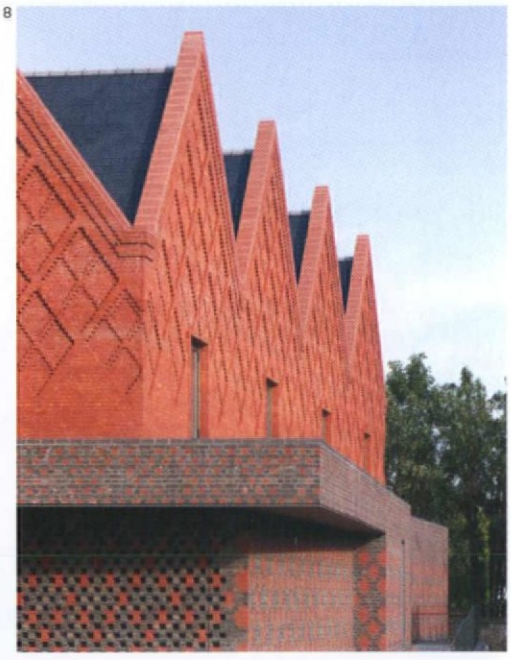
6

Spa School, London, UK
Agents of Change

7

Brentwood School, Essex, UK Cottrell & Vermeulen

8



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7. Brentwood School's new buildings add to a Victorian-era campus
8. Diaper pattern detailing articulates the facade of the assembly hall
9. The new assembly hall and classroom building connect with a retained and refurbished sixth-form block
10. Consciously of their time and employing a similar palette of brick, the two new parts nevertheless exhibit very different approaches to external decoration

10

emphatic protruding framing to some windows and openwork brick ventilation zones. Originally this facade was designed to be executed in a single-colour red brick with reddish pointing. Subsequently, planners pressured the designers to hold a public forum to choose a favoured brick, and the two-colour outcome was the result. The architect's choice of hard modern bricks may be driven by budget but is also a homage to the 1970s housing opposite. Cognoscenti see this decorated shed as mannerist and witty; locals by contrast may well find it reassuringly friendly, with perhaps just a touch of the eccentric and bizarre.

Brentwood School

At Brentwood, a prosperous London dormitory town, Cottrell & Vermeulen has added to the existing buildings that make up the campus of an independent secondary school. There are two main interventions so far, slightly dissonant with each other, to either side of the late Victorian sixth-form block. To the north, the existing building now links to a large classroom block and extends the sixth-form teaching areas. To the south, it connects with an assembly hall for the entire school. The two additions exhibit very different approaches to external decoration, which are worth exploring in detail.

'Could it be that an expertise in applied decoration might rescue architects from their diminished status?'

The classroom block has an 'L'-shaped arrangement of classrooms off a corridor on three floors. It is a simple form with a pitched roof that gets surprisingly complicated in one corner. Corridors are broad, and generously-proportioned windows with low internal sills form window seats. Classrooms feel small, but are impressively kitted out. Their windows, unlike the corridor's, are set back on the inner face of the external wall, allowing for ventilation in the reveal of the opening. Air enters here and is extracted by means of oversized brick chimneys that serve each classroom.

south west elevation

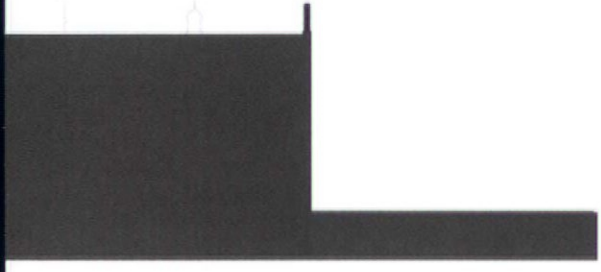
north east elevation

11. The tripartite composition of new and existing elements can be clearly read on the main street elevation, expressing the school's incremental expansion. Familiar forms and materials are given piquant twists, but the overall effect is still civically reassuring

1 assembly hall
2 loose stage
3 fixed stage
4 store
5 plant
6 green room
7 foyer
8 study/social
9 servery
10 common room
11 staff offices
12 classroom block

ground floor plan

0 10m



Brentwood School, Essex, UK
Cottrell & Vermeulen

location plan

Brentwood School, Essex, UK Cottrell & Vermeulen

12

13

12. Classroom in the refurbished Victorian sixth-form block
13. Classroom in the new block
14. The new assembly hall has a complex faceted ceiling, expressed by the geometry of the gables, though despite appearances, the steel-framed roof is largely and cunningly flat

Spa School
Architect
Agents of Change
Photographs
David Grandorge

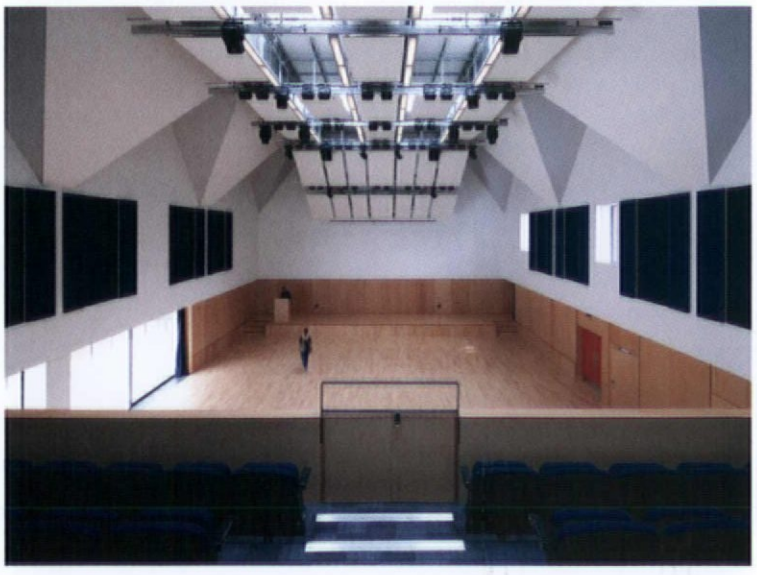
Brentwood School
Architect
Cottrell & Vermeulen
Photographs
Paul Riddle
Tom Cronin

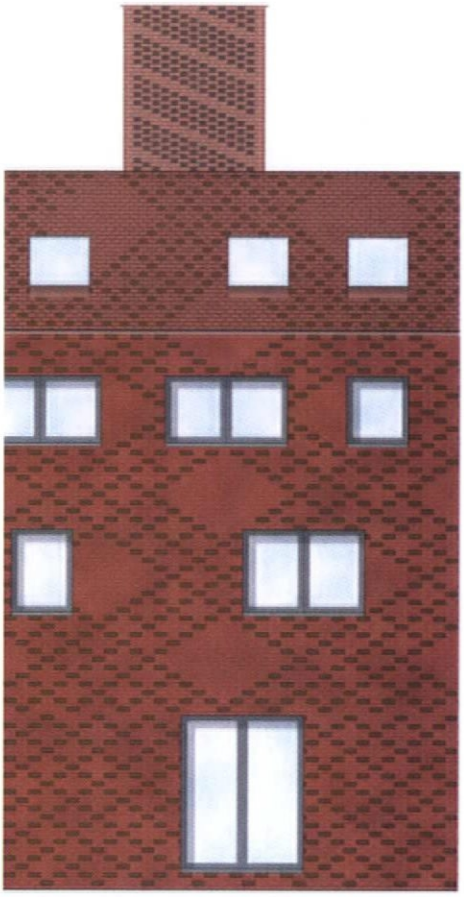
Externally a diaper pattern of contrasting coloured brick or tile runs over all surfaces of both walls and roof – apparently the tilers so enjoyed forming the pattern that they even ran it within the valley roof slopes where it had not been asked for and where only God can see it. This patterning is akin to that on the street elevation of AOC's Spa School. It is flat, and feels to have been applied retrospectively to the base design of the building, wrapping it willy-nilly without trying to meet corners or window openings in any formal kind of a way. In this way, it is intensely modern, and owes more of a debt to Denise Scott-Brown than to William Butterfield.

The assembly hall is something else. It is a large, high-ceilinged shed with a lower skirt on two sides. Most of it is flat-roofed, but this is not apparent to a ground-level observer as the bulk of the building has been eroded by an arrangement of gables on all four sides. This is pretty clever, and made cleverer by the completeness of the integration of a simple steel structure into the complex roof, so that you start wondering whether Cottrell & Vermeulen will soon be discovered by the big supermarkets looking to repeat their trick of making a quart look like a pint.

However, none of this is immediately perceived. What you notice straight away is the decoration applied to the gables of its facades, decoration whose sureness of touch is ironically comforting to Joe Public while troubling to those architects who might prefer their pleasures to be less picturesque. The gable decoration takes the form, once again, of a diaper or lozenge pattern, but this time the pattern is in relief, with brickwork in at least five different planes either projected or recessed from the main wall plane. What is apparent in this case is how different this mode of decoration is from the wrapping of Cottrell & Vermeulen's classroom block or of AOC's Spa School, because here the entire setting out of the building, in plan, elevation and section, is almost entirely dependent on the size, coursing and patterning of the bricks, and that once the informing reticulation of the decoration is established, you would alter it at your peril.

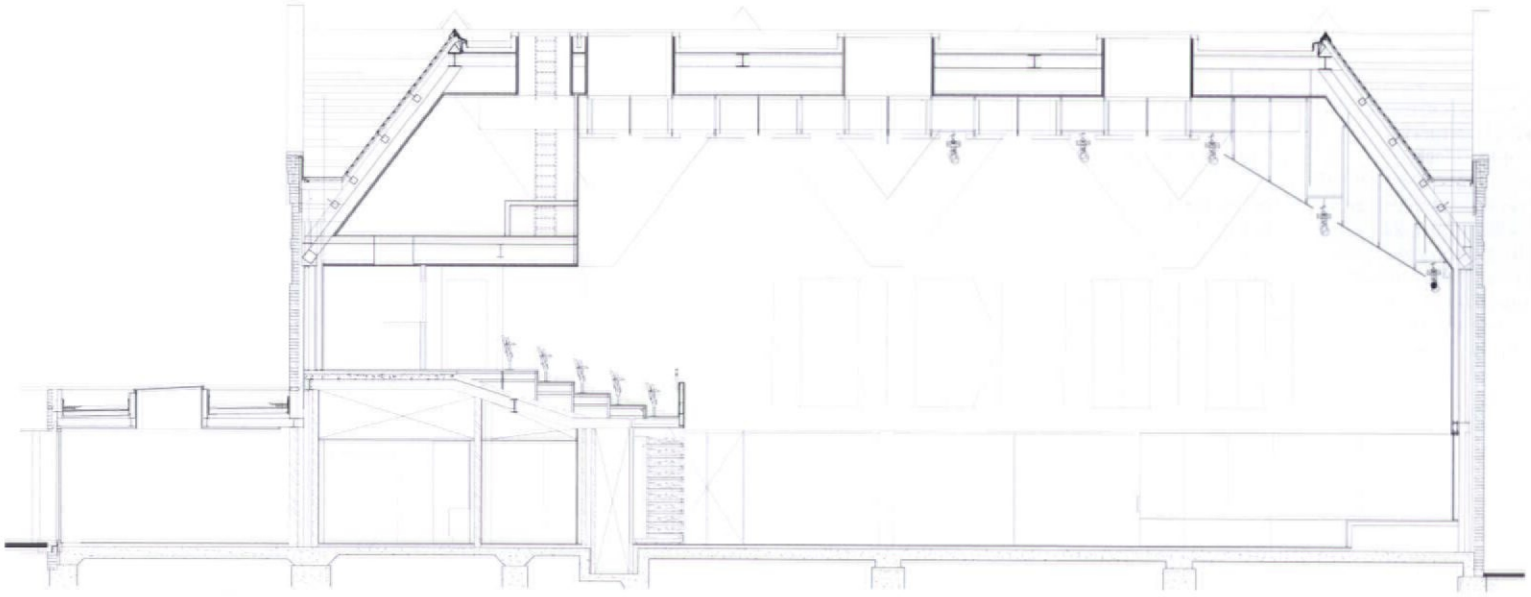
There is something else though about this form of decoration. It makes the architect, and the architect's necessary interaction with the craftsperson who builds it, oddly indispensible. It is complex in a way that is not just spatial but also conceptual, and it is work that non-architects may struggle with. Could it be that an expertise in applied decoration might rescue architects from their ever-increasing diminution of status in the modern procurement of buildings? Perhaps Berthold Lubetkin was right in identifying architecture as a minor branch of the art of ornamental pastry cooking, and maybe this is a talent that architects, uniquely, can provide.





part elevation of classroom block

cross section through classroom block



long section through assembly hall

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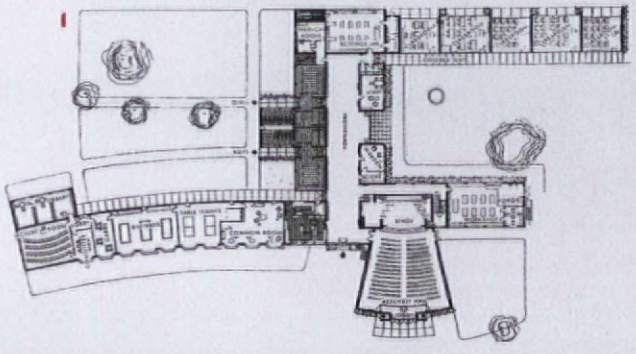
TYPOLOGY QUARTERLY SCHOOLS

NATIONAL GALLERY OF SCOTLAND

NOVARTIS AG, BASEL

1. Jan Steen, *A School for Boys and Girls*, c.1670
2. Albert Anker, *Village School in 1848*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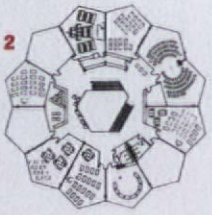
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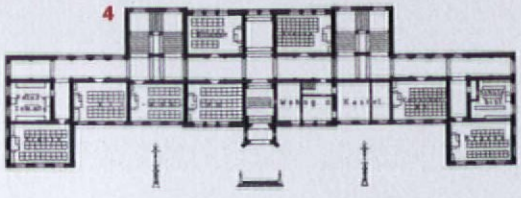
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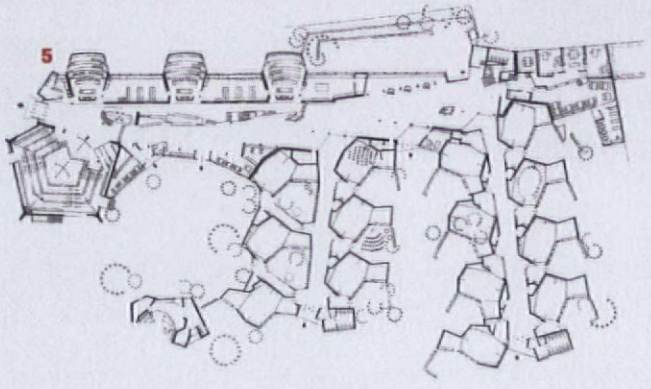
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In the industrial era, schools developed as highly controlled environments to instil the discipline to thrive in a machine age. Now, to prepare pupils for success in a knowledge economy, the evolving typology is more fluidly conceived to provide flexibility, connectivity, and spaces for social and educational encounters

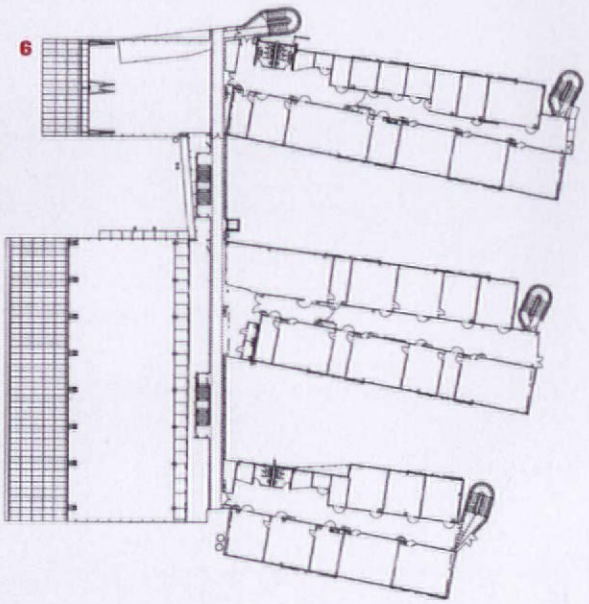
CHRISTIAN KÜHN

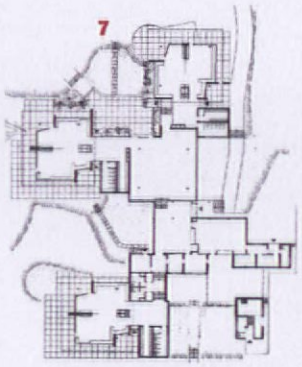
Schools have always been a reflection of a society's stage of development. The painting by Dutch artist Jan Steen (see previous page) illustrates a 17th-century village school where hardly a child appears to be engaged in studying as we know it today. But as strange as the scene may seem, following recent 'constructivist' learning theories, most of these children are actively involved in a learning process. A completely different atmosphere is portrayed in a classroom scene set in a German village school, painted in 1848 by Albert Anker. There are rows of benches; boys and girls are separated, with the boys occupying the pole position and the girls placed on the sidelines. The teacher is armed with a cane, which helps him to at least impress the first two rows of pupils. To a large extent, this classroom is a by-product of the Industrial Revolution. The school had become an institution designed to drill people for the economy of the Machine Age, which depended on a reliable and productive workforce.

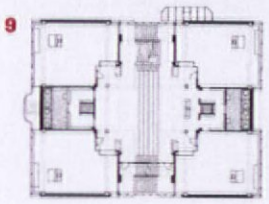
In terms of the basic setting, early modern learning spaces were not so different to their predecessors, at least as far as mainstream education is concerned. As modern as they look from the outside (take, for example, Jan Duiker's famous Open Air School in Amsterdam, built in 1927–30), the classroom itself has hardly changed. Of course, it has become spacious and light, and girls and boys are once again treated as equals. But it is still a highly controlled space, symbolising another stage in the Industrial Revolution, that is the rise of the service sector and a growing need for people working in administration.

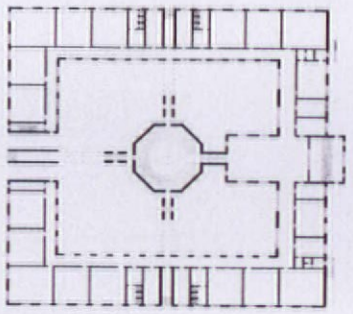
Today, the majority of schools across the world continue to follow this standard model and its associated typologies. Even those among recent schools that are aesthetically more ambitious usually adhere to the teacher-centred classroom-and-corridor model that has been the standard for almost two centuries.

Why should we expect radically different learning spaces will become mainstream any time soon? The main reason can be found in the post-industrial society and the demands of its knowledge economy. Almost a decade ago, the Organisation for Economic Co-operation and Development (OECD) published a study on 'Key Qualifications for a Successful Life and a Well-Functioning Society' (Rychen and Salganik, 2003) that identified a set of three essential qualifications: 'act autonomously', 'interact in heterogeneous groups' and 'use tools interactively'. 'Acting autonomously' requires students to set their own goals, to take their own decisions and to assume responsibility for the results. 'Interacting in heterogeneous groups' relates to a society that requires cross-cultural understanding and co-operation, both on the local level (due to migration) and on the global level (due to globalisation), but also across different age









PRECEDENTS

1 Walter Gropius' Village College, Impington, 1936
2 Behnisch & Partners' Gymnasium, 1969
3 Classroom plan of village primary school, 1889
4 Carl Hintrager's Esseg School, 1894
5 Hans Scharoun's Geschwister-Scholl-School, 1961
6 Helmut Richter's Hauptschule, Kinkplatz, 1994
7 K Martin Baxter's High Lawn Primary School, 1953
8 Aldo Rossi's Middle School, Broni, 1983
9 Herman Hertzberger's Apollo School, 1983

groups in an ageing society.
'Use tools interactively' relates to the importance of information requiring responsible users, who are able to tailor technology according to their needs.

Helping students to acquire these qualifications requires forms of teaching that go beyond traditional models: these include moving from teacher-directed to self-directed learning; personalised learning, which reduces instruction time and increases project work; dividing up the social unit of a class into subgroups and creating new forms of learning partnerships; teaching in teams and across disciplines; and opening up the school to the network of learning that surrounds it physically and virtually.

School buildings that respond to these changing needs may be best identified by their 'Space for Teams', offering an adaptive infrastructure with well-designed micro-environments. In regard to typology, we can expect a greater variety than that allowed for by the standard model, although the new schools share at least four characteristic features: flexibility, clustering, a common core and connectivity.

The first feature, flexibility, offers the possibility of creating different learning arrangements to meet different needs. This does not necessarily lead to an open-plan school or to machinery with sliding doors and partitions. Flexibility of usage can be achieved through a better granularity of room sizes in combination with sophisticated time management. As a by-product, this offers a potentially higher level of efficiency than in the standard model, where circulation spaces are mostly unusable for learning and mono-functional classrooms are underused.

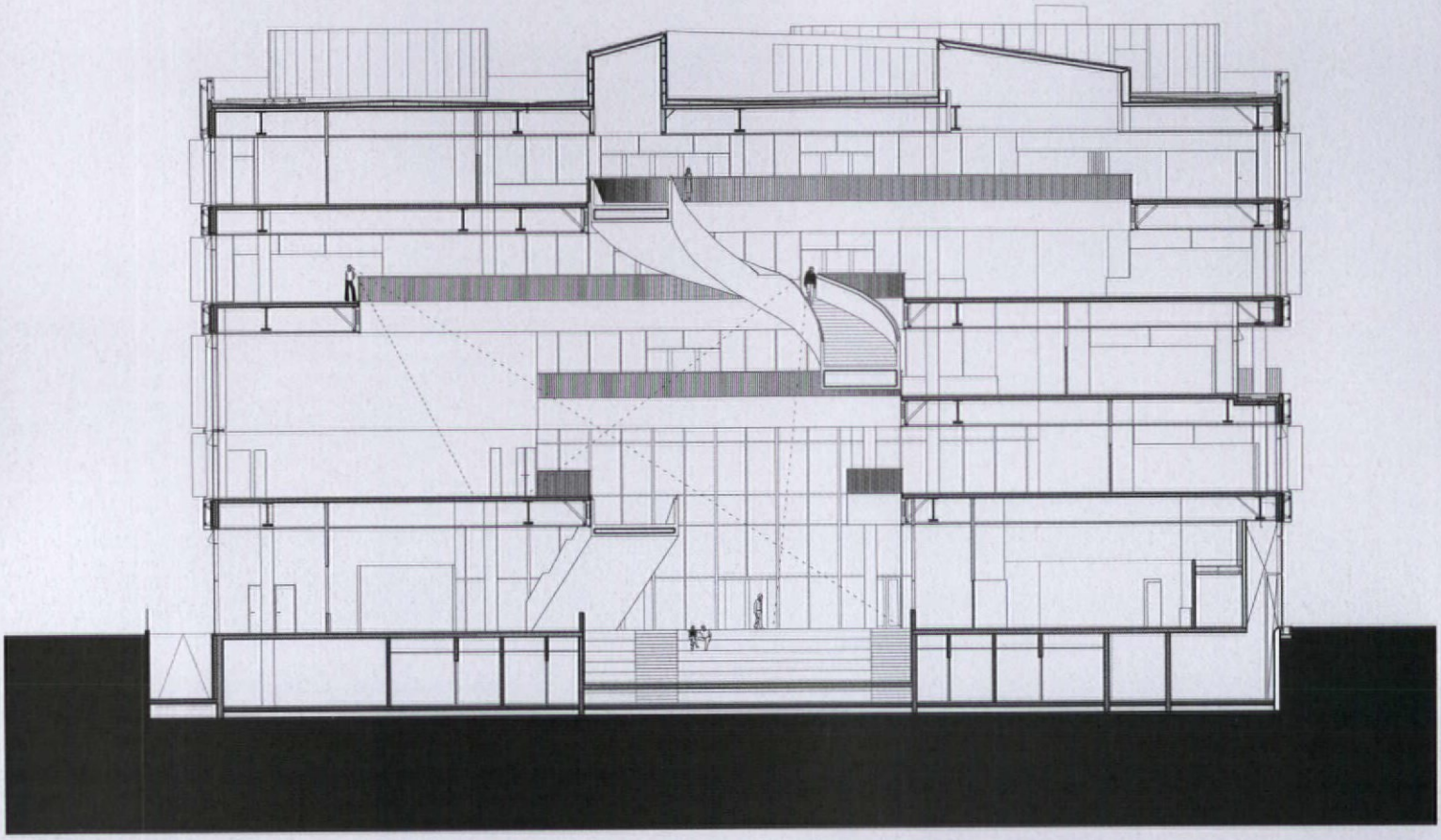
Clustering, the second feature, is delivered by dividing up the school space into a hierarchy of smaller clusters, introducing an intermediate level between the former classroom and the school as a whole, and support-team teaching. These clusters are the result of the experience that complex team-building processes work best in a large group of 150 people sharing a territory.

The third feature, the common core, is an informal meeting place and a melting pot for the school as a whole. And last but not least, the idea of connectivity plays a vital role. This implies that the school is a node in a wider network of learning, locally optimising the use of learning institutions, such as schools, kindergarten and library; and globally using the potential of ICT.

It is important to note that none of these ideas is new. They have been discussed and implemented during the major wave of school reform in the 1960s. In spite of initial positive results, none of these buildings was a lasting success. The spaces' sound-proofing proved insufficient; artificial lighting and ventilation made the users feel uncomfortable. The main problem, however, was that teachers had not been adequately trained, and as they were rarely involved in the planning process, they did not feel much incentive to live up to a concept that might have been promising in theory, but did not perform in everyday life.

Today's similar concepts can only be successful if the lessons of these large-scale experiments are properly learned. First, they indicate how important the participation of users in the planning process is. The majority of the most innovative schools of the last decade have been designed in planning processes involving as many stakeholders as possible. This requires a lot of effort, and costs time and money. But this is well invested, since users not only feel more satisfied with the results, but also become experts who help to create better designs.

Second, architects 40 years ago attempted to create aesthetically neutral spaces, hoping that the users would fill them with life. Again, recent successful examples chose a different approach, attempting to develop memorable school spaces. The big challenge here is to create spaces that are as attractive as possible while at the same time kept open for future changes. The examples reviewed overleaf try to find the right balance between robust infrastructures and carefully designed (but not over-designed) micro-environments that can be adapted by the users.



Ørestad College

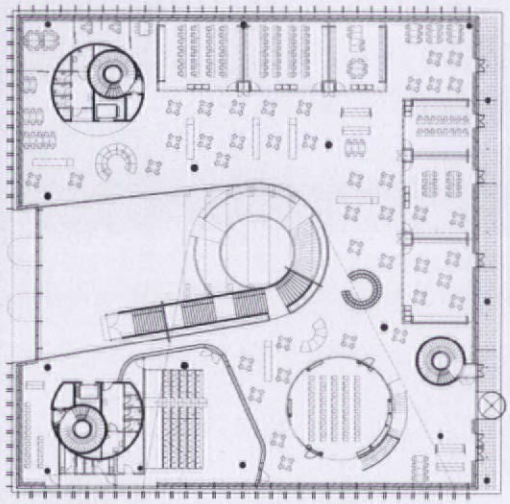
3XN ARCHITECTS

Copenhagen, Denmark, 2007: 12,000m²

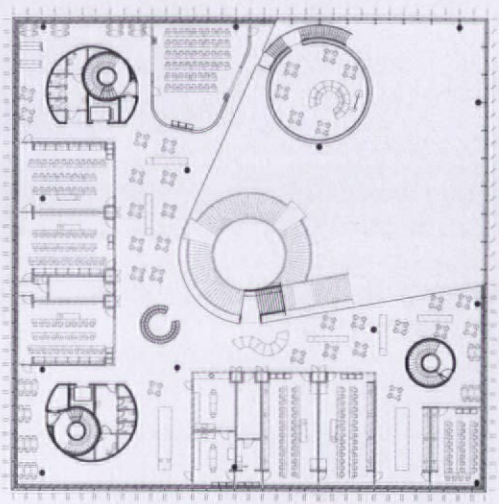
Located in the main urban expansion area of Copenhagen, the building was commissioned as a landmark for the neighbourhood and for the reform of the Danish educational system. The project displays a visionary interpretation of openness and flexibility regarding team sizes, varying from individual groups to classes and assemblies.

It offers an impressive core space that allows for vertical and horizontal interconnection, including retreat areas for the students. This central atrium encourages a sense of community and articulates the college's ambition to provide interdisciplinary education. Four boomerang-shaped floor plans are rotated to create the super structure, which forms the overall frame of the building, with four study zones occupying one floor plan each. The flexible layout, combined with the usage of advanced IT systems and sophisticated time management, encourages students to make their own decisions in respect of learning goals and learning strategies, thus preparing them for university.

From the exterior, the building manages to stay on par with the massive neighbouring malls and housing blocks, justifying the huge interior volume from an urbanistic point of view. As a rule, the glass is smooth with the deck fronts, but on each floor, one facade is withdrawn to create an outdoor space for the students. In front of the glass facades, a series of coloured semi-transparent glass louvres can open or close to offer protection from the sun, while adding dashes of colour to the indoor environment.

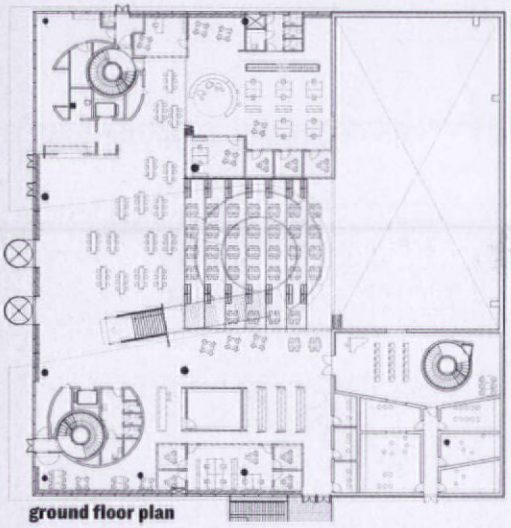


first floor plan

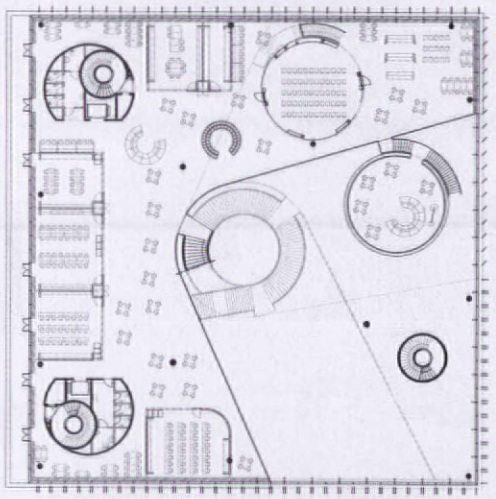


fourth floor plan

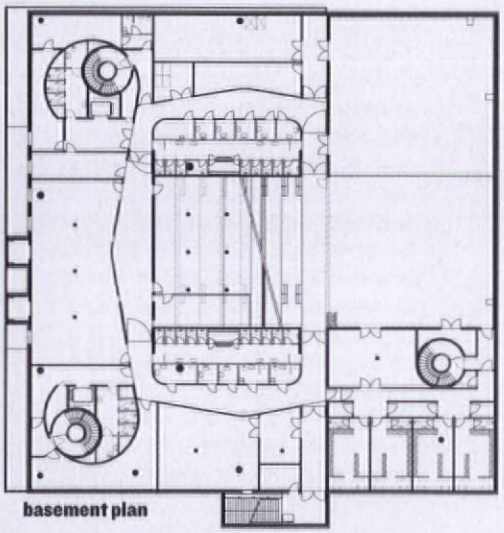
ADAM MØRK



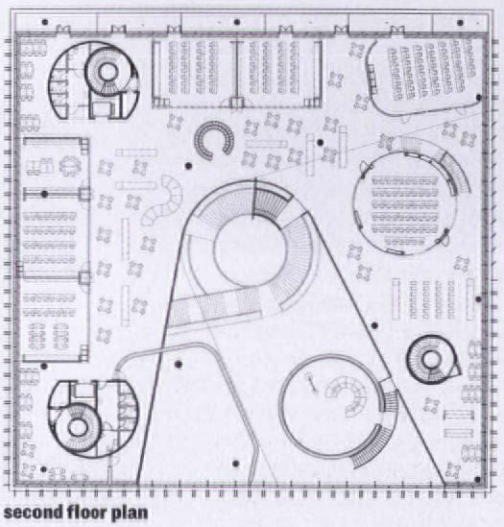
ground floor plan



third floor plan

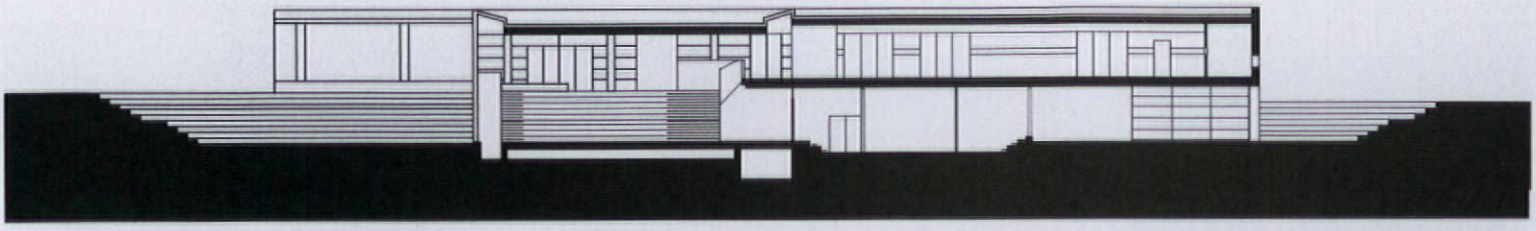


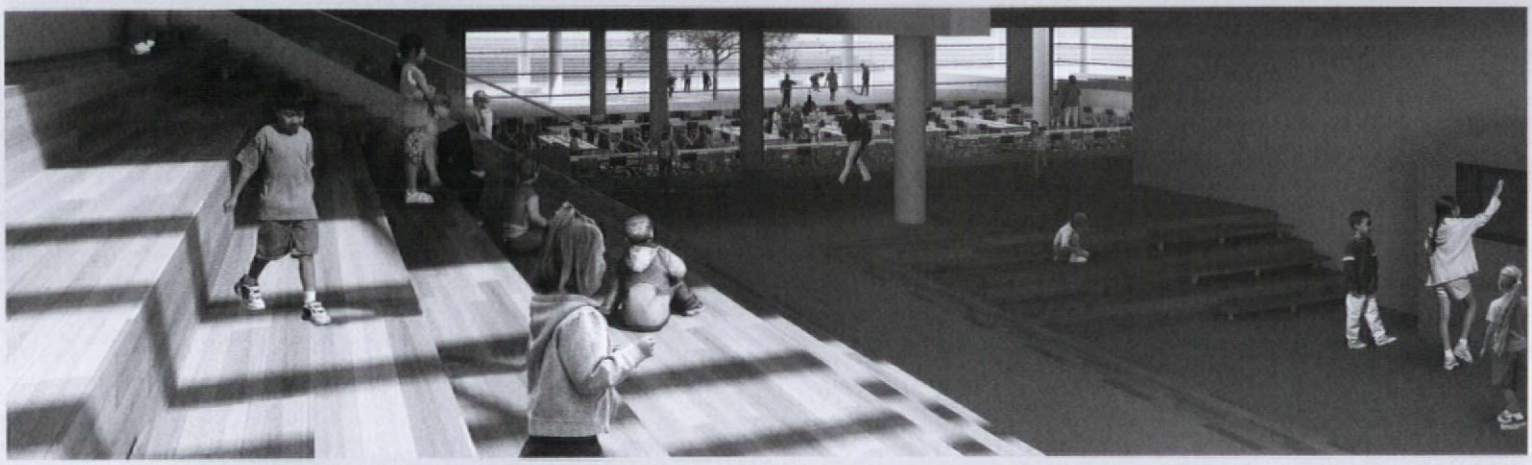
basement plan

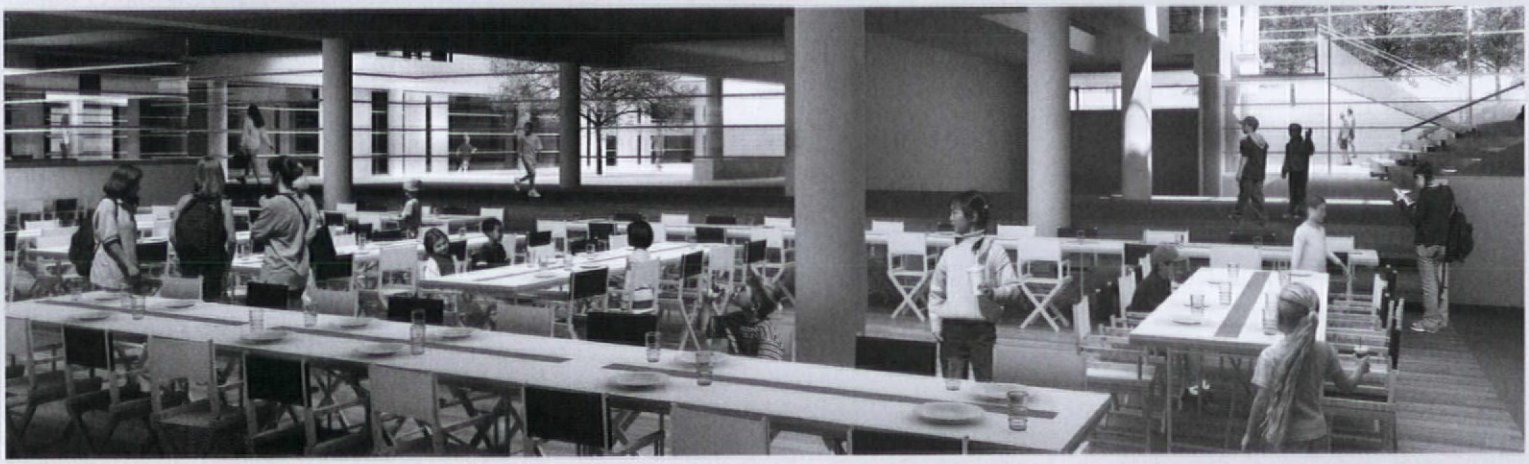


second floor plan

Left: The massing of the building matches the scale of the neighbouring mall and housing blocks, its blank appearance giving little indication of the internal complexity of volumes
Above: Ørestad College is organised around a central atrium where a generous spiral staircase allows the college's 350 students to circulate freely, between four open-plan study zones







Romanina School

HERMAN HERTZBERGER, AUTONOME FORME AND MARCO SCARPINATO

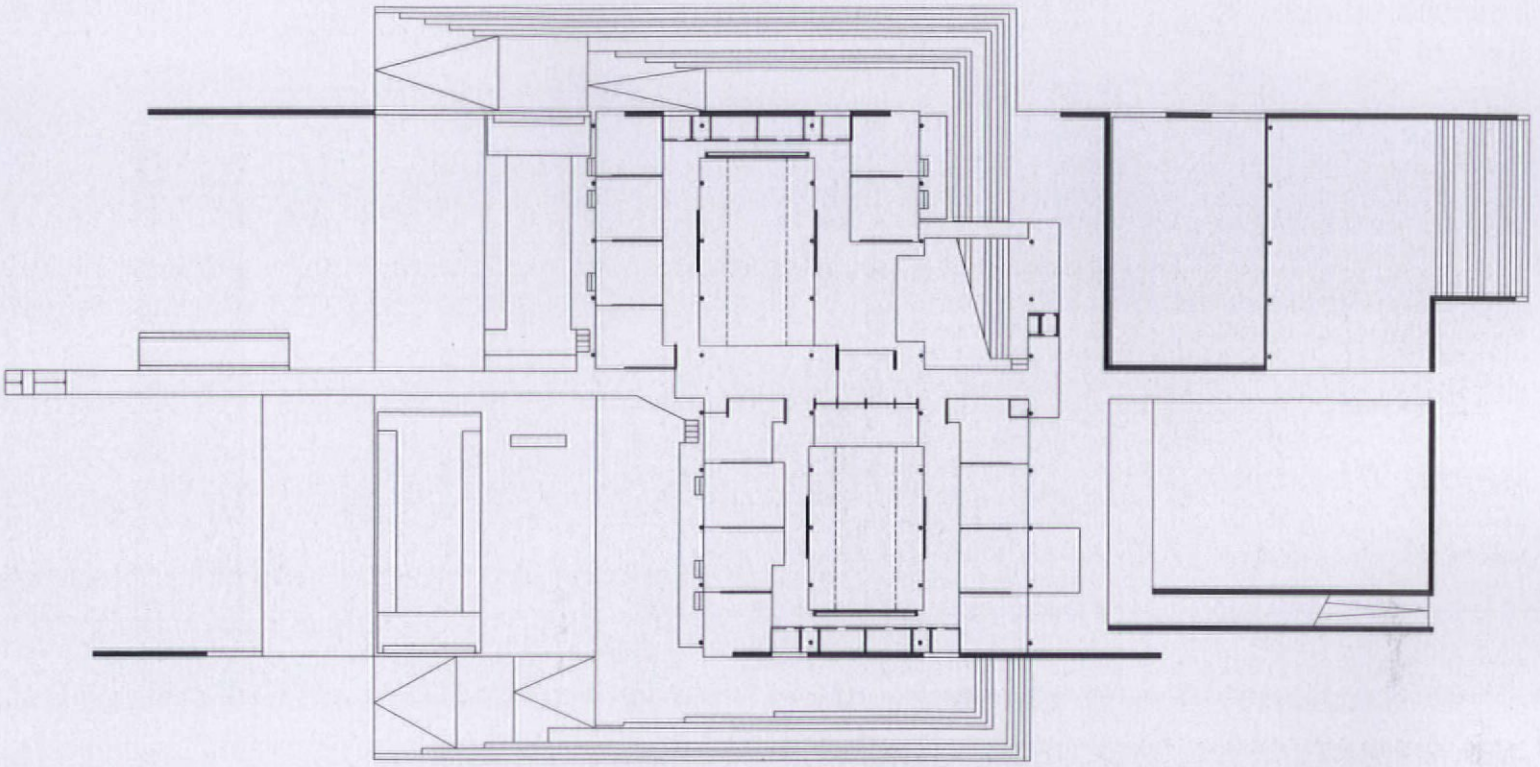
Rome, Italy,
2010: 4,900m²

The combination of a primary school with a middle school in a suburb of Rome, the plan consists of a repetition of architectural units, each of which comprises two times four classrooms adjoining a connecting street. Each unit is arranged around a patio, echoing the design of a traditional Roman house, which, thanks to the mild Italian climate, serves for most of the year as an additional outdoor space that can be used for teaching. It is with this purpose in mind that the 2m-wide awnings were added. Extensions may be added in future by building one or more new units around a patio.

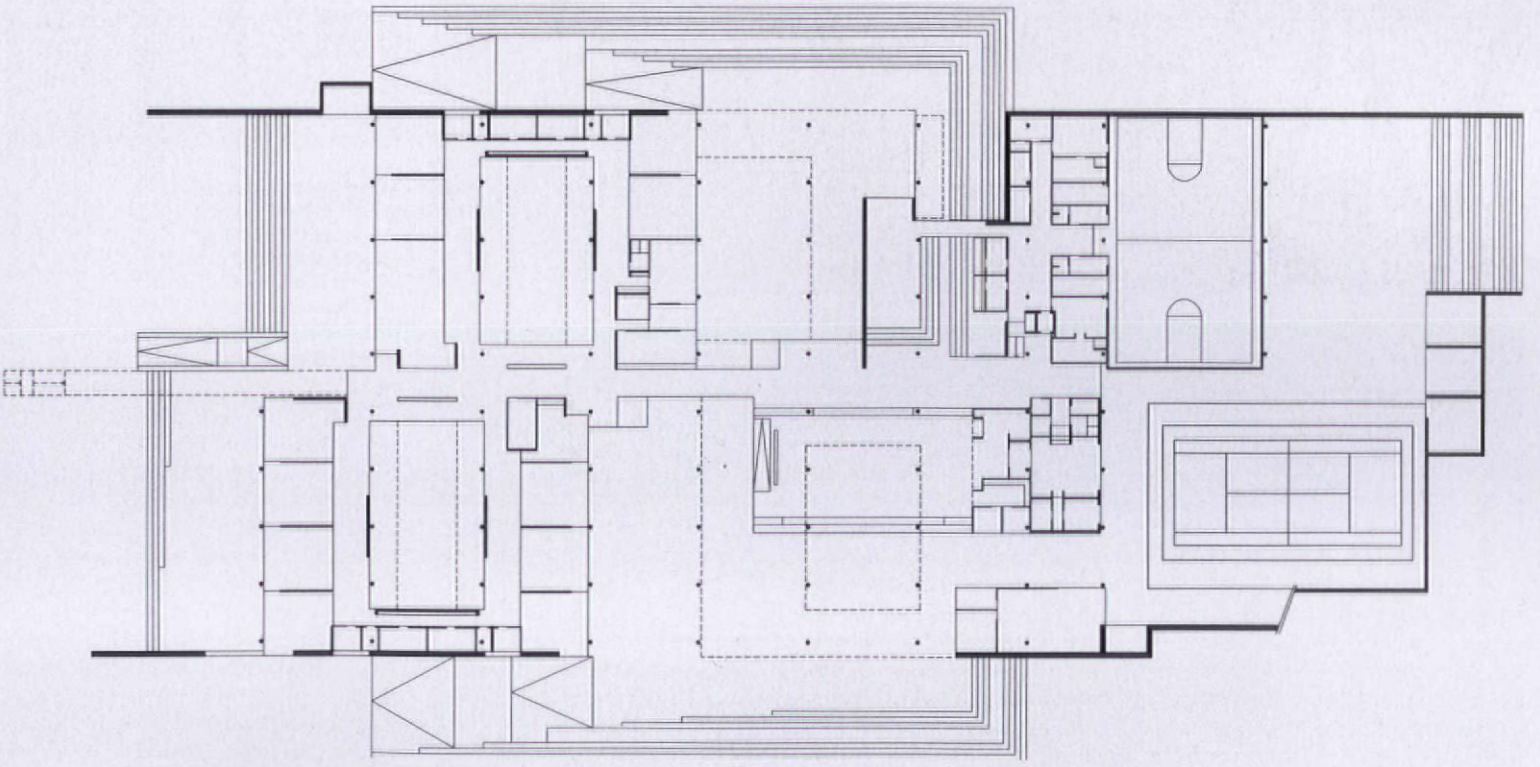
The building stands – like an excavated site – almost an entire storey below the surrounding ground, and is accessed from the two flanking residential quarters through a central square, which is also sunk into the ground and surrounded by steps for sitting on.

Top: This stepped external area allows both for playful interaction and more formal assembly, and continues Herman Hertzberger's interest in flexible micro-environments, which he explored at his 1983 Apollo School in Amsterdam, featured in plan on page 61
Above: The dining space has views across to the external gathering space, in a deliberate attempt to create a social continuity between inside and outside

The building reflects the architect's experience in creating highly efficient school structures in the Netherlands, applied here to a different climate and culture. Combining a robust spatial infrastructure with carefully designed 'micro-environments', the building offers flexibility for future expansion and adaptation. While being conventional at the moment, the classrooms can easily be transformed into a cluster structure. The core of the building is located slightly off-centre on the main axis, combining the dining hall with an auditorium-like atrium that connects the two levels of the building.



first floor plan (early design stage)



ground floor plan (early design stage)

Leutschenbach School

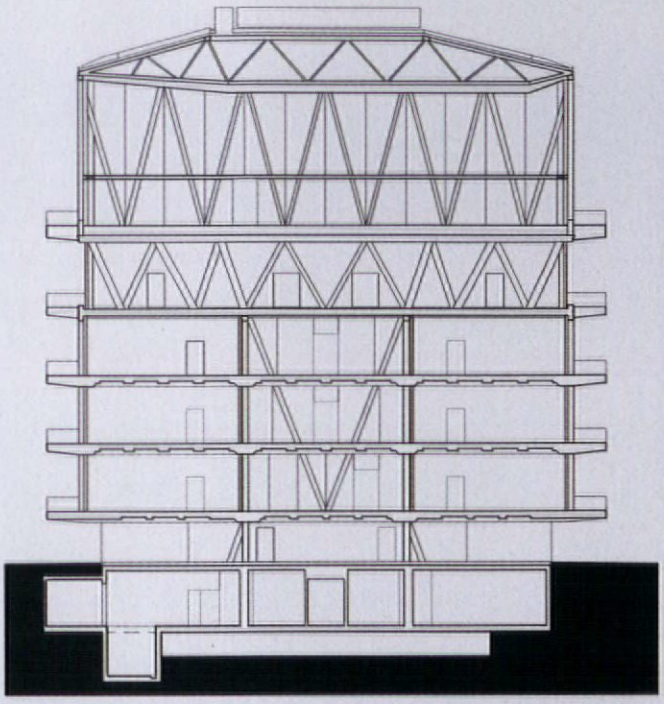
CHRISTIAN KEREZ

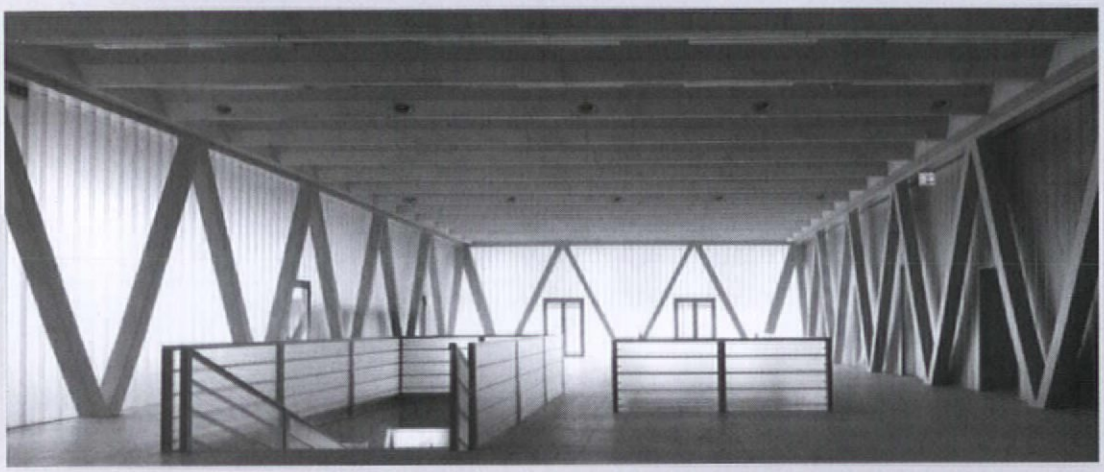
Zurich, Switzerland, 2009: 9,840m²

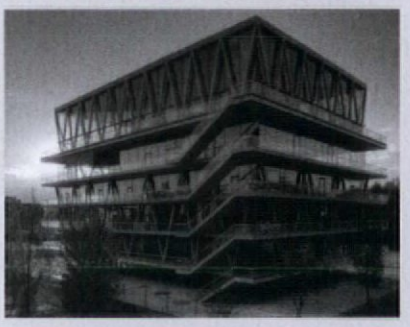
Located in a suburb of Zurich, this is another landmark building intended to signal the importance of education to its neighbourhood. Not unlike a high-rise, the project stacks classrooms, a library, a multi-purpose hall and gymnasium into a single volume with a small footprint. The result of this vertical organisation is a surrounding park, which can be experienced to its full extent by the school itself, but also benefits the adjacent neighbouring communities.

All levels are composed as structural steel frameworks. The location of the bracing differs from one level to another, allowing various layouts of the interior spaces and offering level-specific relationships to the exterior. The ground level is low in height and has a close relationship to the exterior playground area. As the building rests on only six base points, no structural elements obscure the relation to the park at this level.

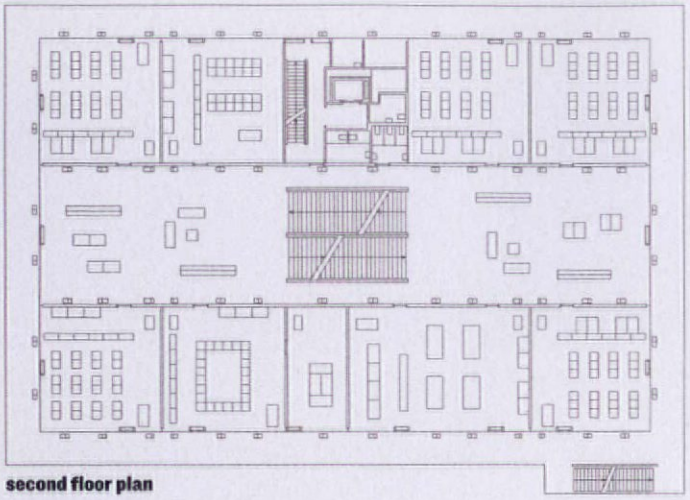
All classrooms are located on the second, third and fourth storeys. A generous hallway, giving access to all classrooms, also acts as an extra place where classes are held. Wide and single flights of stairs lead from one hallway to the next. A system of opposite running stairs divide juniors from seniors, yet both runs meet in a collective and central hall on the fifth floor, offering a common core for the school. Immediate access to the library and the multi-purpose hall complete this level. The top floor is crowned by the gymnastic hall, where the entire footprint of the project is fully comprehensible.



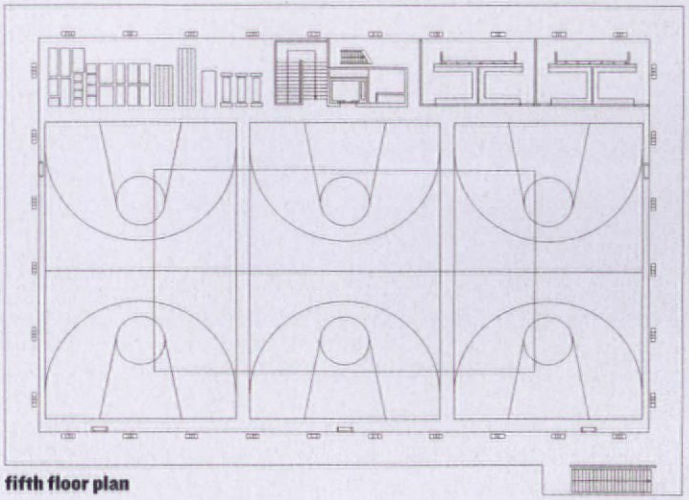




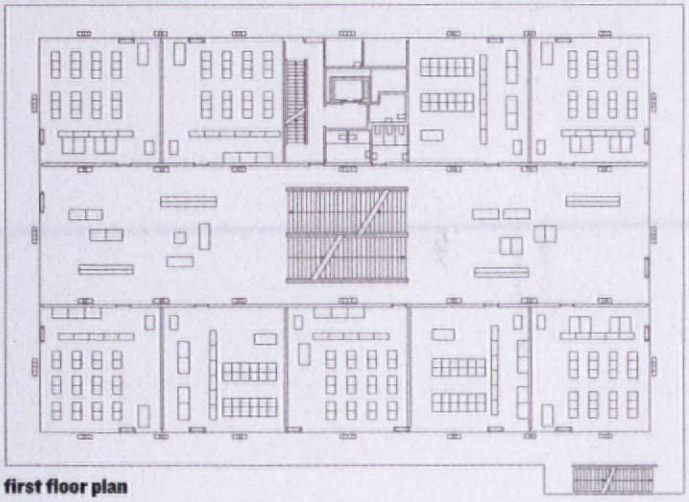
Above: The small footprint of the building, and its subsequent height, have enabled an adjacent park to be created for the enjoyment of the local community
Left, above: One of the light-filled circulation spaces
Left, below: The gymnasium takes up the entire top level



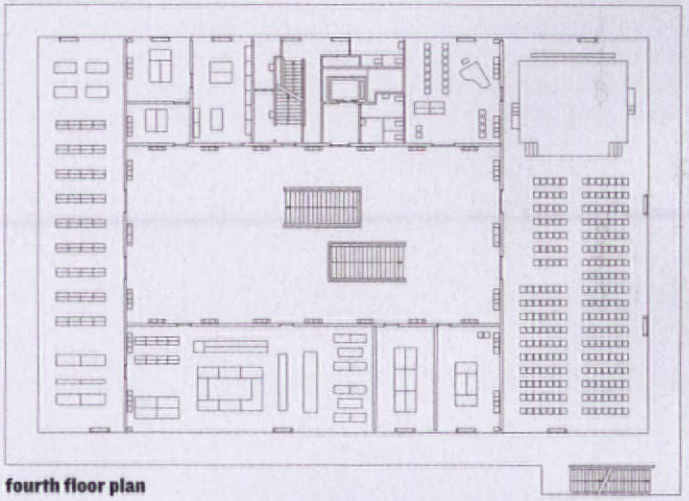
second floor plan



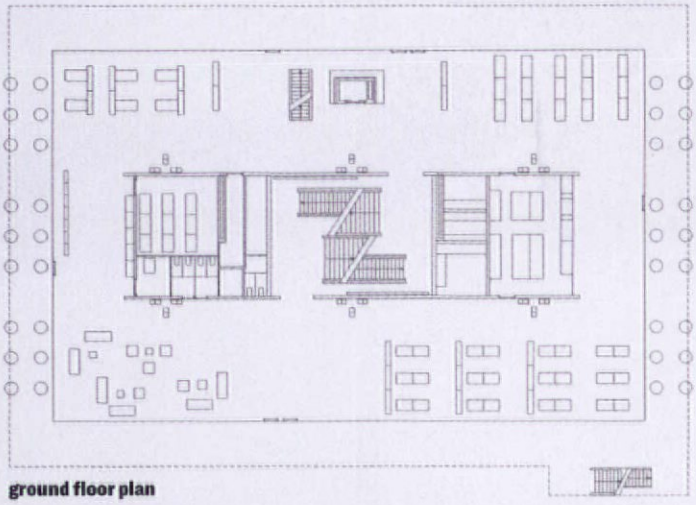
fifth floor plan



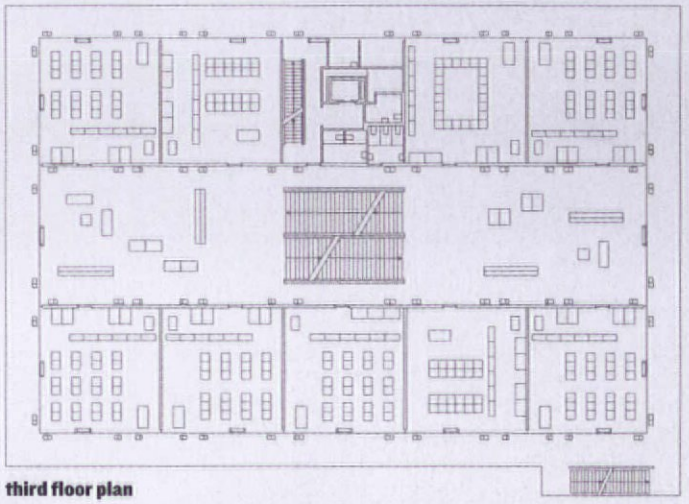
first floor plan



fourth floor plan



ground floor plan



third floor plan

Ringstabekk School

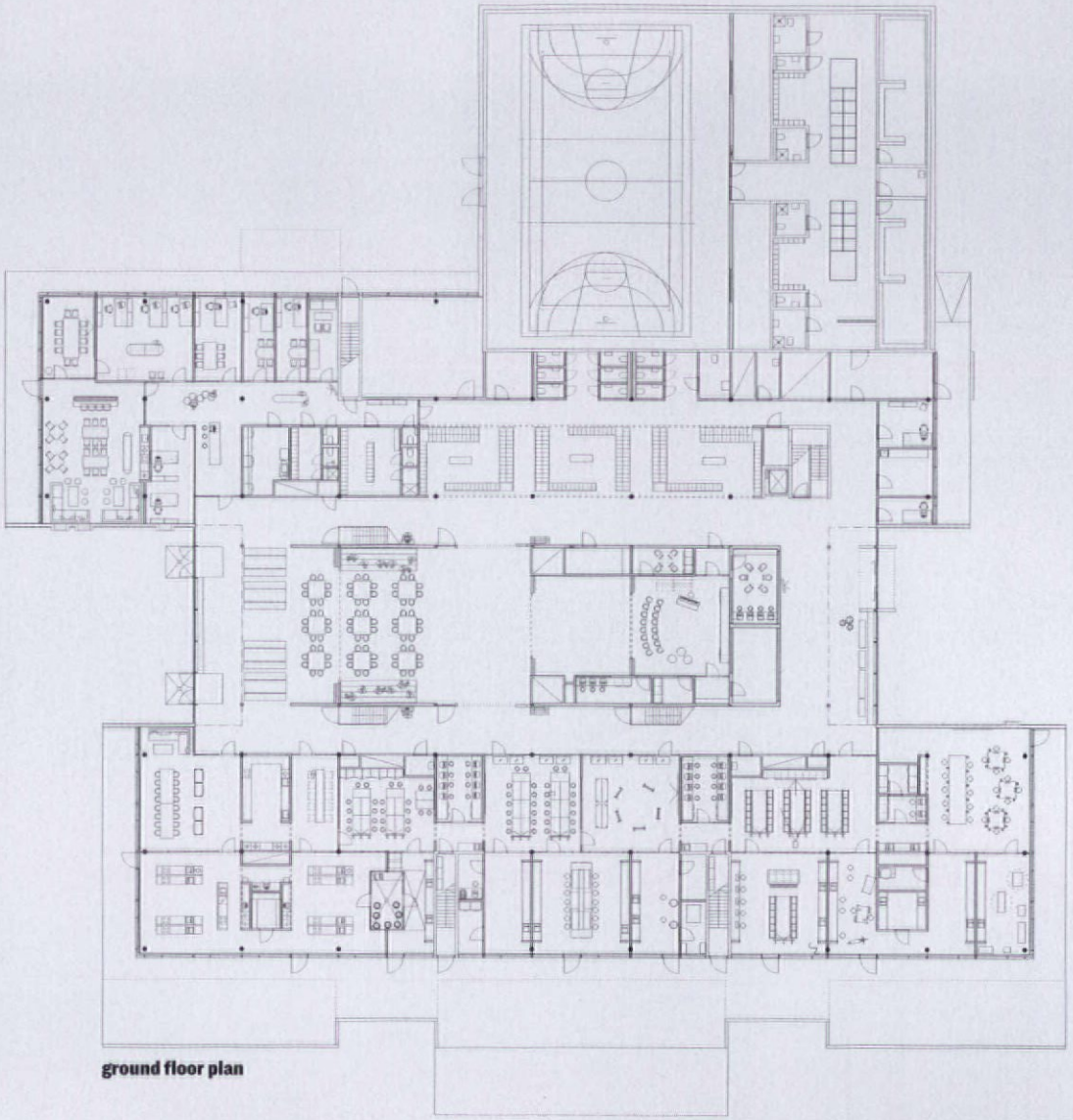
DIV.A ARKITEKTER

Baerum, Norway,
2005: 6,435m²

The design brief for the school emphasised the potential relationship between new pedagogic methods and space, calling for a flexible, workshop-like building that could easily accommodate developing approaches. The school offers two levels with the multi-purpose entrance hall, the gymnasium and a large science and workshop area on the ground floor and three clusters on the second floor. Each cluster offers a range of spaces, both in nature and size, ranging from intimate group rooms to formal auditoriums for up to 60 pupils, with an open study landscape in the centre, connected with an office for the team of teachers responsible for each cluster.

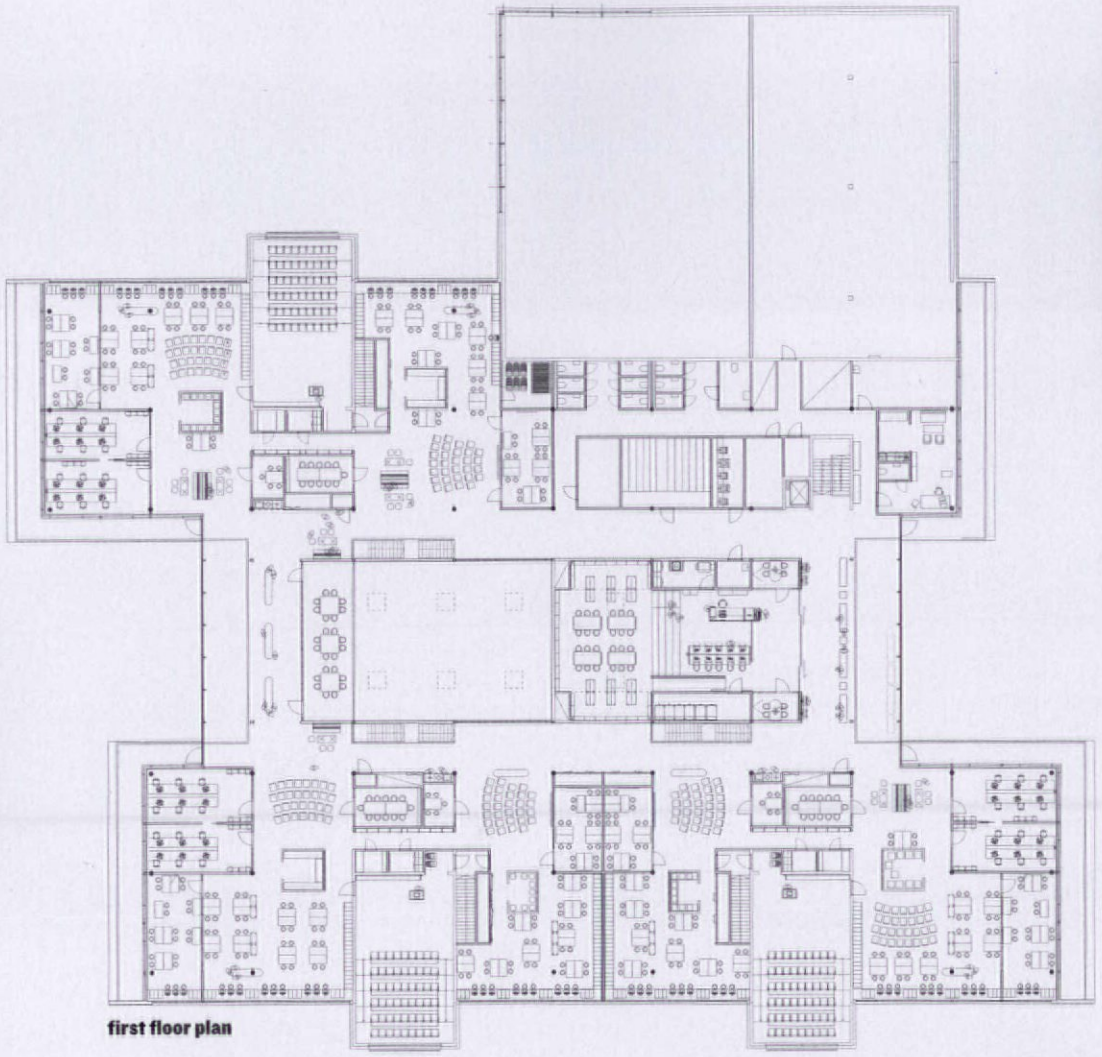
Typical of a cluster model, the three clusters are themselves arranged around a common core, a two-storey central communal space, the 'campo', which can accommodate the entire school population. This layout offers the possibility to use a broad range of teaching and learning methods, both theoretical and practical. Special emphasis was placed on the outdoor area, which is designed to accommodate 'learning through landscape'.

The school was generally devised with a focus on energy efficiency and sustainability. Due to its compactness and mechanical ventilation, it is the first school in Norway to achieve 'Passivehaus' standard. There is under-floor heating on the ground floor and wall-mounted radiators on the first floor. The facade is clad in untreated larch, prefabricated white concrete elements and an aluminium glass profile system. Internal light walls combine signal colouring and light tones, with the 'campo' and library clad in oiled oak.

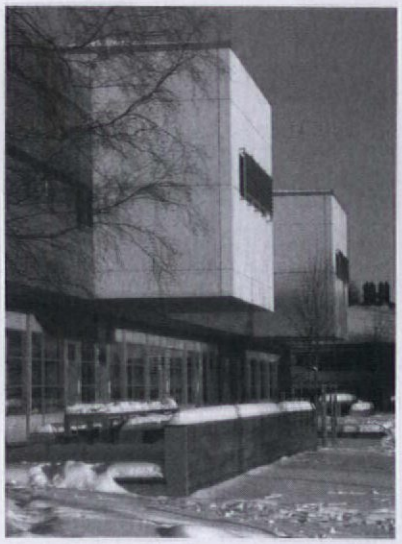


ground floor plan

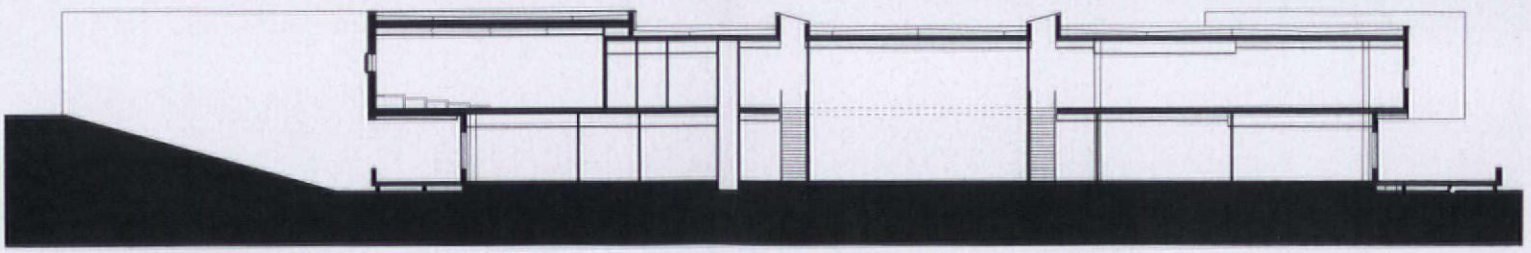
KIRSTIN BARTELS. HUGO + AASHILD



first floor plan



Above: A snowy scene at Ringstabekk School; perhaps because of the chilly Norwegian winters the school's interior provides an ample array of spaces in which the life of the community can be played out
Left: Pupils enjoying the double-height dining space; robust materials allow for the energetic clambering nature of youthful interaction



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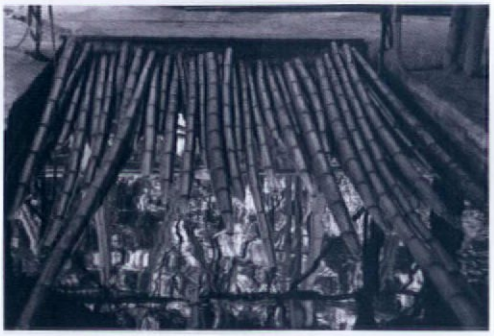

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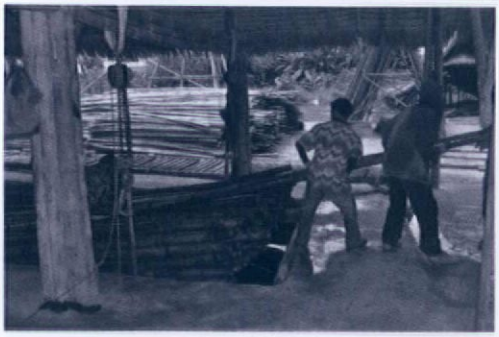

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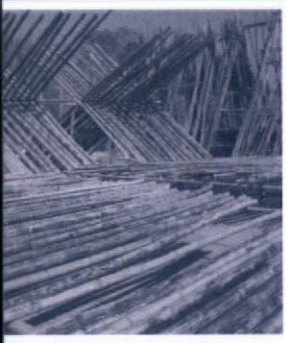

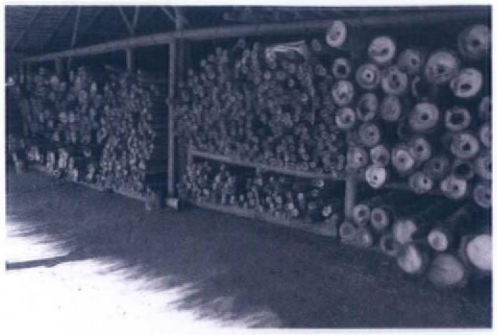

1. Bamboo requires very little processing for use in construction. First, the segmented cores are drilled out to enable preservative and insecticide to penetrate the cane structure
2. Canes are soaked in Borax to repel insects
3. Canes being removed from the Borax bath
4. Drying canes in the sun
5. Stacked canes showing a characteristic range of thicknesses. Canes grow to maturity in between three and five years, compared with timber, which takes 25-50 years
6. Constructing one of the bamboo-framed pavilions at the Panyanden School in Thailand

CANE AND ABLE

Since ancient times, bamboo has been used for a wide range of everyday objects, from huts to kitchen utensils, paper and musical instruments. Now, as an excellent example of a renewable, local resource, its versatility is being increasingly exploited in sustainable construction, shown here in this innovative project to build a primary school in Thailand

CATHERINE SLESSOR

Strong, light and sustainable, bamboo is an infinitely versatile yet still underexploited building material. Botanically, it belongs to the grass family and grows with astonishing rapidity; some varieties can sprout by as much as a metre in a day. Bamboo is propagated from its root system (rhizomes), so it begins growing again soon after being harvested, as compared to timber, which, once felled, requires lengthy reforestation. Easy to plant and cultivate, bamboo canes reach sufficient maturity to be used in construction after only five to eight years and sometimes in as little as three years. By contrast, timber takes between 25 and 50 years to mature.

Bamboo is inherently structurally efficient. It is strong and stiff, with a tensile strength that matches steel. Because of its segmented hollow form, it is also extremely light and elastic, and can be bent into curved profiles. This structural efficiency is matched by functional efficiency. At every stage of bamboo's life cycle, there is a use for the material. Processing bamboo generates virtually no waste, since it has no bark, and its leaves can be used as animal fodder.

Insect or fungal attack are the main threats to bamboo's structural integrity, so canes are treated with an insecticide and preservative such as Borax. Typically, hollowed-out canes are soaked for a week and then dried in the sun. Little else is required in the way of processing, hence the embodied energy required to produce a unit of bamboo is extremely low: ~30 MJ/m³ per Nmm², compared with values of 80 for wood, 240 for concrete and 1,500 for steel.

As bamboo is so geographically abundant, there is often no need to transport the material, saving on energy costs. Bamboo buildings can be recycled or dismantled, and individual components are easily replaced.

Now re-envisaged as a regional, sustainable technology, bamboo is being gradually liberated from the stigma of 'poor man's wood'. This project for Panyaden School in Chiang Mai, Thailand, employs bamboo to form lightweight curved roofs sheltering a cluster of pavilions. Designed by young Dutch practice 24H, Panyaden is a private bilingual school for 375 primary-level students.

Underscored by a Buddhist philosophy, which emphasises a respect for nature, the campus is arranged around a tree-like network of pathways. Classroom pavilions are constructed from adobe walls with roofs made from local bamboo. Larger halls or 'salas' for assembly and the school canteen are simply large bamboo canopies anchored by stone foundations. The effect is like walking through a grove of bamboo. The architects worked with local builder Chiang Mai Life Construction, which specialises in traditional materials and building techniques.

Though architecture has long sought to emulate the beauty, intelligence and stability of natural forms, the systematic adaptation of such forms for construction purposes is still in its infancy. Yet as the consequences of rapacious and inappropriate use of materials are becoming depressingly evident, there is renewed interest in natural, local substances such as bamboo. This remarkable material is capable of generating new forms of holistic, sustainable architecture that resonate with culture, place and human needs.

A related Skill feature on Sixten Rahlff's vernacular daycare centre in Mozambique is at architectural-review.com/SixtenRahlff

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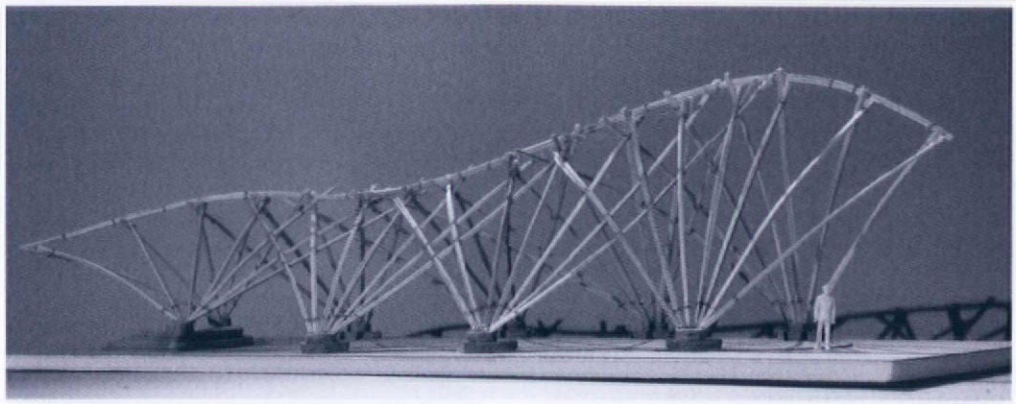

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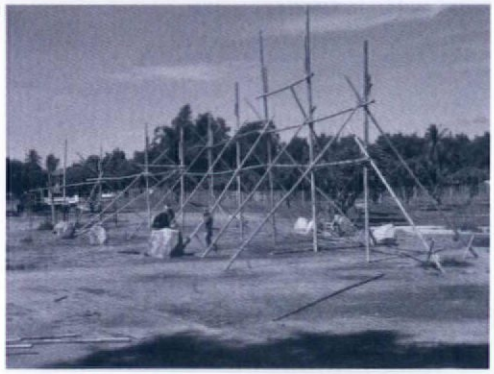

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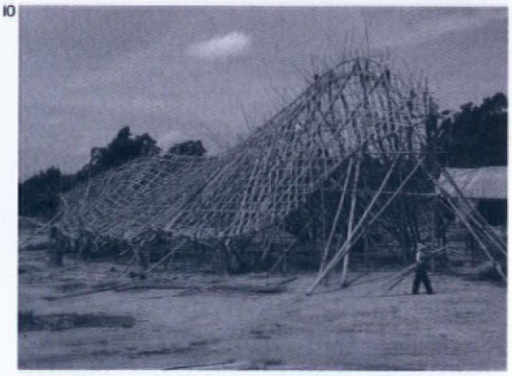

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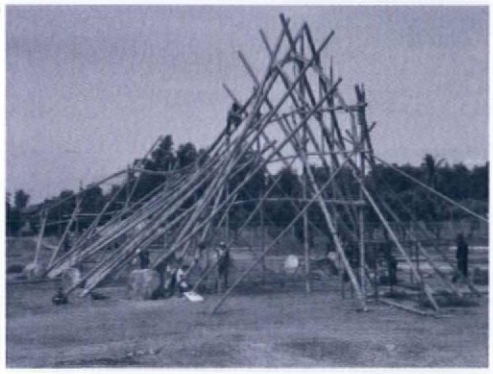

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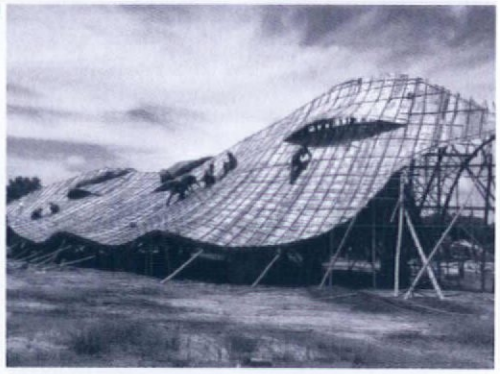
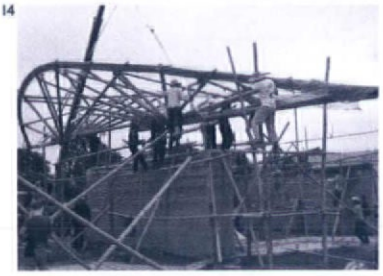


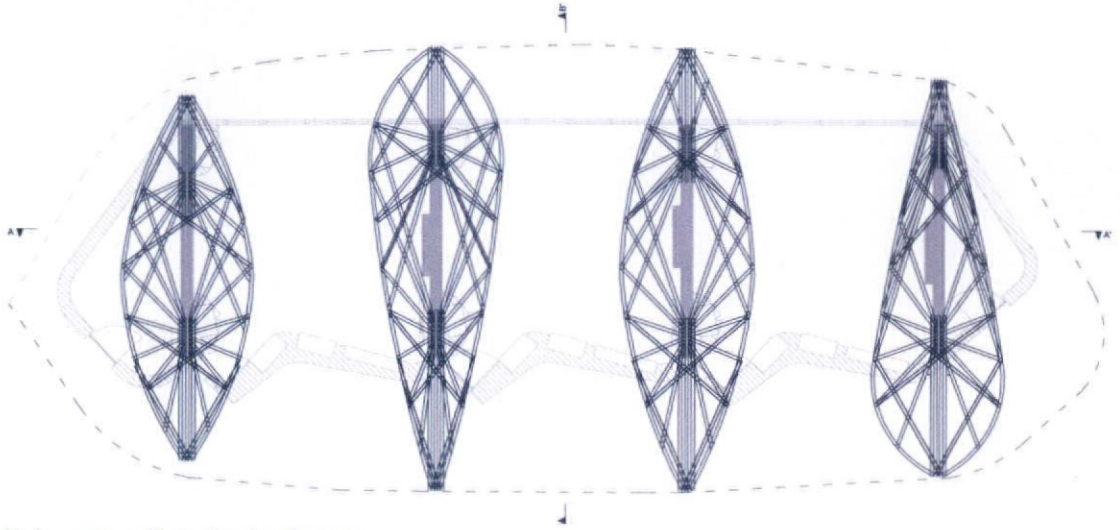
7. Model of the 'sala' type pavilion, essentially a bamboo roof supported on stone foundations, reworking a traditional Buddhist archetype
8. Constructing the sala, beginning with the basic frame
9. The frame takes shape. All bamboo used in the project is sourced locally
10. The roof develops, a hand-built assemblage of bamboo members firmly lashed together
11. The roof is finished in 'tiles' of split bamboo

I2

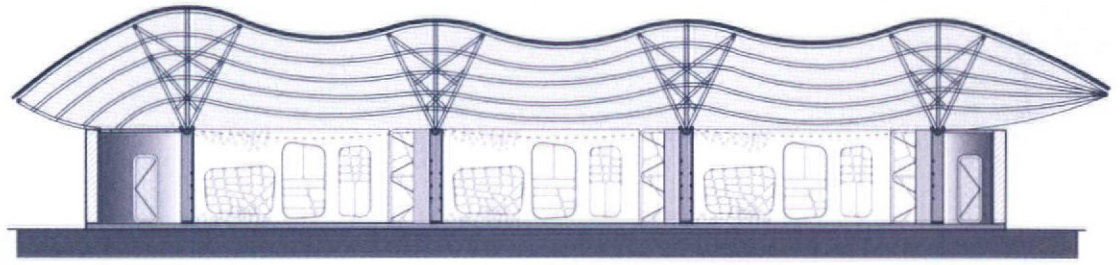
I3

I4





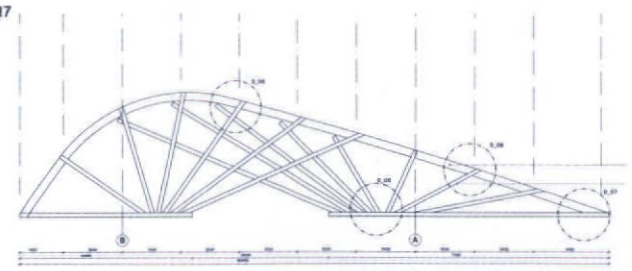
kindergarten pavilion - plan of roof trusses



long section

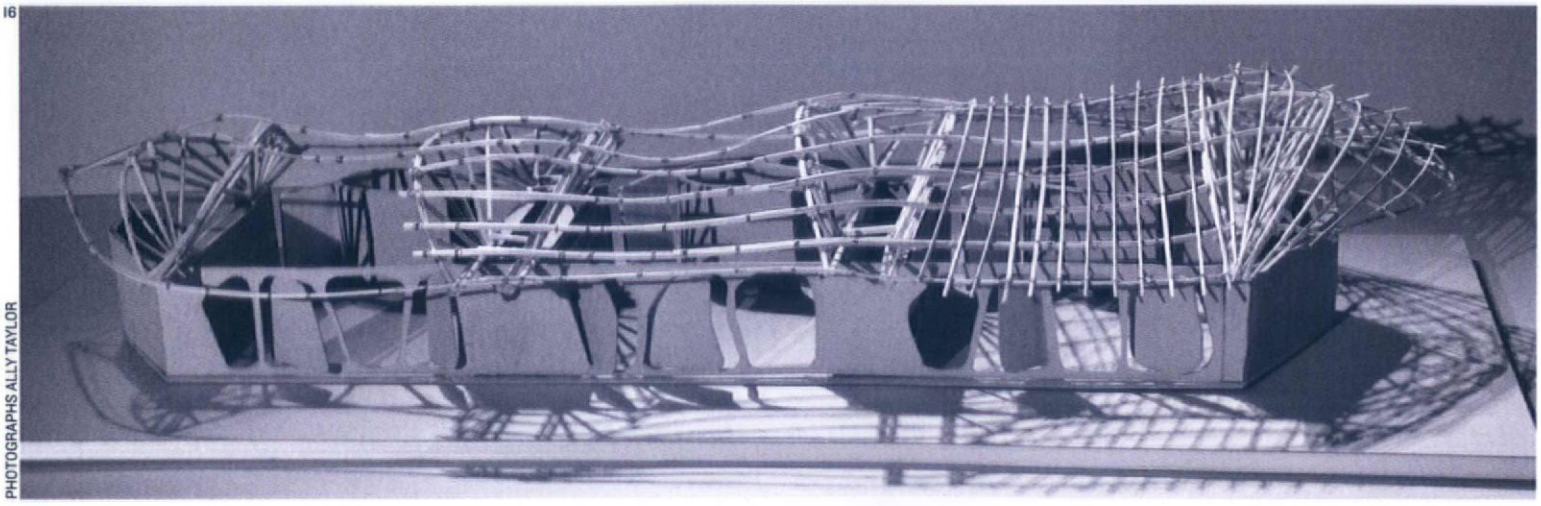
I5

I7

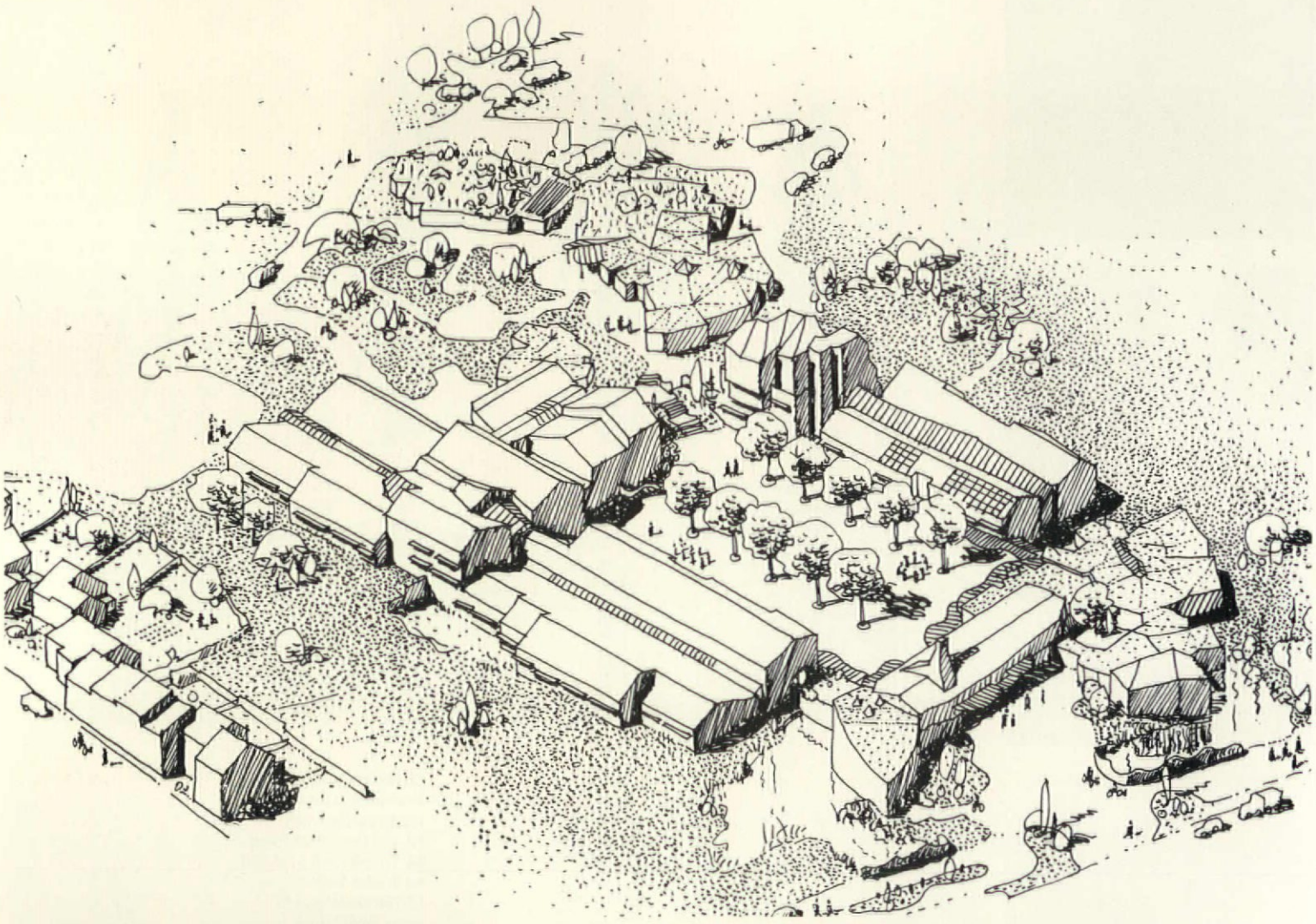


I2. Constructing one of the roof trusses for the kindergarten block
I3. The completed truss
I4. Trusses being hoisted on to adobe walls
I5. The kindergarten nears completion
I6. Model of the kindergarten pavilion
I7. Truss detail

I6



PHOTOGRAPHS ALLY TAYLOR



EVALUATING KROLL'S ECO SCHOOL

Ten years ago, the AR published a new secondary school at Caudry in northern France by Lucien Kroll, which marked an important advance in green building. The result of an architect/contractor competition, the school had to meet a demanding list of ecological criteria. As reported in January 2002 these were met and the school got off to a good start. But how has its life developed?

CRITIQUE BY PETER BLUNDELL JONES
PHOTOGRAPHS BY DENNIS GILBERT

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1. (Opposite) bird's-eye view drawing of the school, arranged around its central *place* with two rows of trees: academic classrooms are above to the north and vocational ones are below to the south. The entrance is bottom left from an existing street, leading under the bridge-like administration, with the library and the hall to its right and the pupils' common room to its left. In the top corner are the restaurant and services, with the Arts tower forming a corner link to the main complex. The row of staff houses to the left continues an existing street
2. The Arts tower seen across the flourishing sedum-clad roofs of the school restaurant
3. Restaurant, kitchens and service building, as seen from the top of the Arts tower

In 1992, the Green Party politician Marie-Christine Blandin, a former biology teacher, was elected President of the Regional Council for Nord Pas de Calais, and bargained for a special building programme, Haute Qualité Environmentale (HQE). A new Lycée (school for 15-18 year-olds)[1] was required at Caudry, a small industrial town near Cambrai, former centre of the lace industry. This became a test vehicle, launched as an architect/contractor competition in 1996 with a strict agenda of 67 environmental performance targets and heavy financial penalties for non-compliance.

The HQE criteria naturally demanded minimal energy consumption, low embodied energy and short transport distances, but also much more. Toxic materials had to be avoided and every kind of recycling considered, even reuse of the building for a different purpose. Water consumption had to be minimised and excess rainfall retained, with daylight to be provided wherever possible. A 'green site' was expected, without disturbance, pollution or waste: even the contractor's site-huts had to be redesigned. The competition was won by Lucien Kroll's office AUIA and contractor Caroni, along with technical specialist Alain Bornarel and engineer Sodeg. Although the competition process precluded the full participation that Kroll favours, he was able to study the town, and on winning the competition, to consult the school staff in detail before making adjustments. The school was built in two phases from 1997 to 2001 and has been in full operation for 10 years.

Today, only the solar chimney on the administration block, the solar protection on the south sides, an array of solar cells and a solar water heater directly signal the ecological theme. But there is more behind the scenes, including a mechanical ventilation system with heat exchangers, heat pumps and underground 'Canadian wells' (buried tubes to preheat or precool the air). Visible but less obviously 'ecological' is the exceptional daylighting, intended to reduce electricity consumption and to improve environmental quality, allowing pupils and staff to see out and register the time of day.

We have come a long way from the 'schools without walls' of the 1960s, with their deep plans and the blanket assumption that artificial light is superior because it is more controllable, and that windows are just a way of wasting heat.[2] Daylight and view are now recognised as having a measurable psychological impact,[3] but artificial light still sets the norm because of building regulations, and it is not unusual to see new British schools on sunny days with every fluorescent tube alight.[4] One of Kroll's main ambitions was to build a fully day-lit classroom, and he found that the necessary light level could only be achieved by introducing daylight from both sides: from external windows and via a fully top-lit central corridor.

Not only here but throughout the school daylight floods in, sometimes from apical rooflights as in the library, sometimes with generous windows or through small courts. Meeting the energy criteria did not preclude the use of glass or enforce a minimum envelope: it was more a matter of thick insulation, of sealing junctions 'fanatically', and of avoiding cold bridges between the warm structure and the cold cladding.

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Kroll long ago discarded a Brutalist concern for substance, so the exterior is all added facade. This had the advantage at least that Kroll and his team could ring the changes on the cladding to distinguish the various parts, using a skin of brick here, timber boarding there, even a coat of stainless steel on the administration – the worst for embodied energy but of limited area and balanced by abundant use elsewhere of larch shingles, the least energy-hungry cladding of all.

A chance to stake out varied territories

Articulation of parts within a complex remains for Kroll a fundamental issue. Adding such a large institution to a small town in one lump would have caused problems of scale and contrast, while building to a repetitive mechanical system would have produced an oppressive sameness to endure throughout its life. It was therefore desirable to differentiate the space, making a science classroom different from a language room, or a library from an assembly hall. As Kroll argued long ago,[5] this is less a question of functional convenience or efficiency than of forming recognisable territories: the making of places with which to identify, to feel at home, and by which to navigate. He thinks we need to put back artificially some of the variety and complexity that used to arise spontaneously when buildings were added one by one in response to changing conditions, before the advent of reductive planning briefs and the dominance of technically driven assembly.[6]

At its heart, the Caudry school has *une place*, like a French village or town square,[7] across which the two main ranges of teaching buildings face one another. Ordinary classrooms are on the north side, technical ones to the south, reflecting the more or less 50/50 division between academic and

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4. The north side of the *place* seen from the main entrance, looking west
5. The *place* from the other end, looking east towards the administration with the Arts tower on the left
6. First-floor plan of the complex, showing the upper levels of the varied wings. The block with the fully day-lit classrooms is at the top
7. Ground-floor plan of the complex with the main entrance to the right, under the bridge formed by the administration

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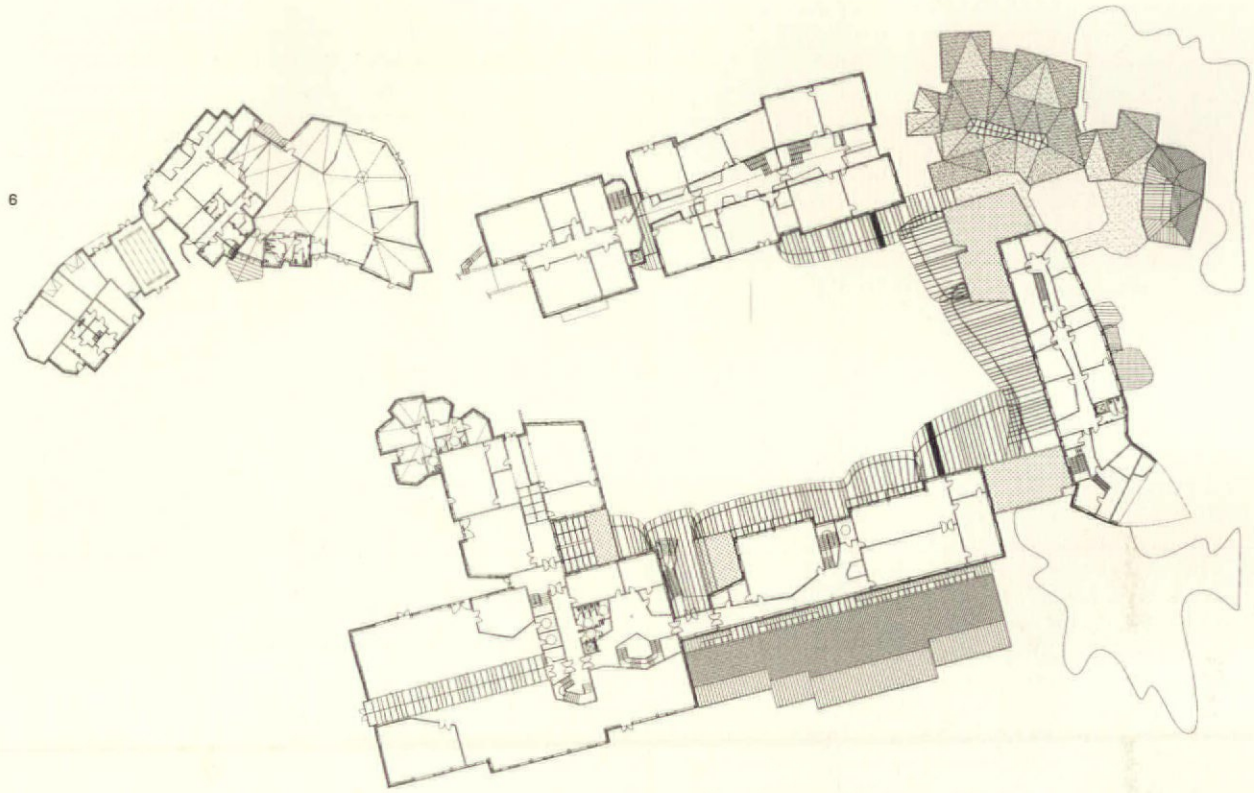

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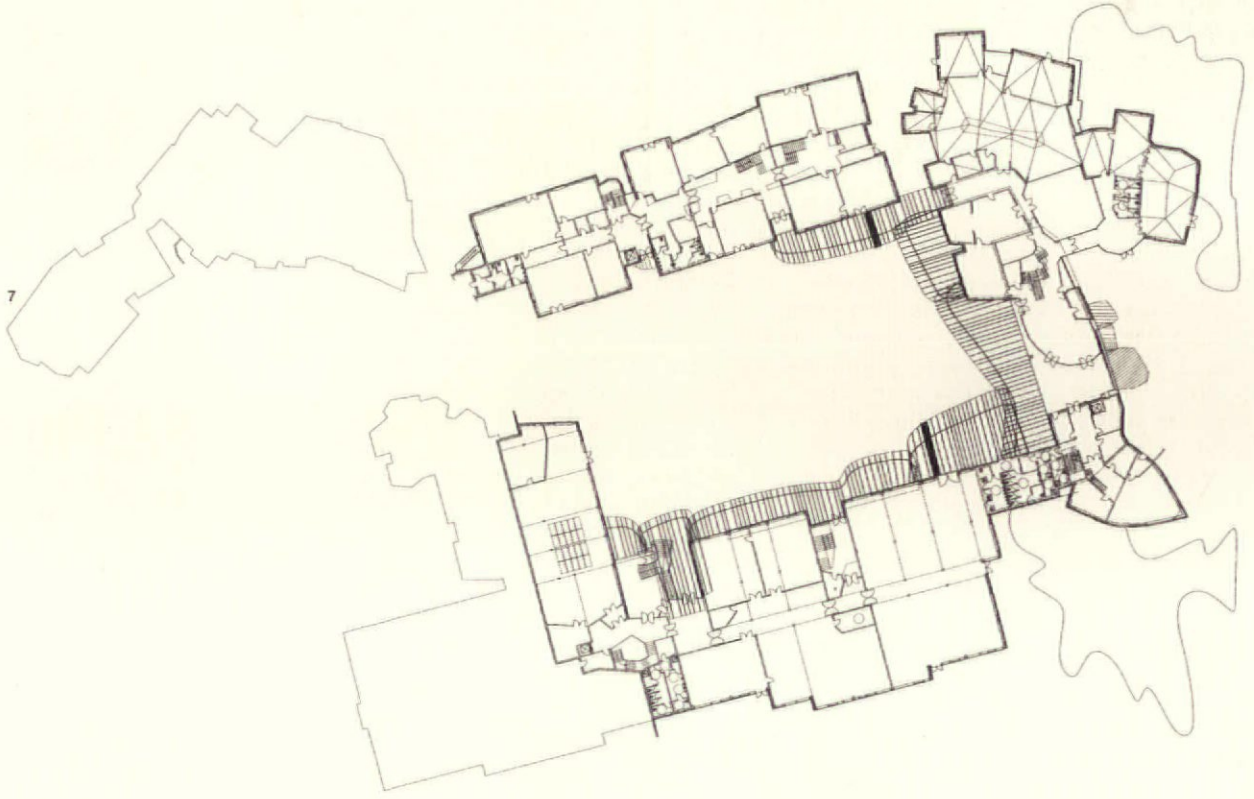

vocational teaching. The *place* is an outdoor room that can be used for social events and celebrations, but it serves predominantly on warm days for the pupils' breaks. Regularly placed trees add summer shade, and benches around the edge, many beneath glass roofs, produce extended thresholds.

The east side of the *place* is dominated by the metal-clad administration block, forming a bridge over the main gate at ground level, which is opened when pupils arrive and leave.[8] Next to this, the north-east corner holds the library and meeting hall, the south-east the pupils' common room, both helping to contain the entrance. To the west, at the other end of the *place*, the technical teaching block folds around to enclose the south-west corner, whereas to the north-west is the polygonal Arts tower, the highest part culminating in a music room like a small concert hall. The inviting set of steps at its foot in the north-west corner of the *place* leads up towards the dining hall and kitchens beyond.

This change of level is a reminder not only that site contours are respected and retained, but that foundation spoil has been absorbed into the landscape, precluding the energy costs of removal and dumping. In the south-east and lowest corner of the site is the pond designed to retain the run-off after heavy rain, delaying it before it passes on through to the town's river system. The final element in Kroll's bird's eye view is a row of dwellings on the south side provided for school personnel. This extends a pre-existing street of old industrial cottages, integrating the whole complex into the town. The street's given angle is the main reason why everything is skewed slightly west of the south.

First impressions were encouraging: the school appeared in good condition with a patina of weathering but no evident graffiti or vandalism. Classrooms and corridors within were also well maintained with almost no accidental damage and little evidence of age. The ubiquitous linoleum, almost alone on the list of flooring materials after embodied energy and recycling load implications had eliminated the rest, looks remarkably good. It is rewaxed once a year and polished regularly: the few points of damage were at external thresholds due to driving rain or where minor movement had occurred.

Light and landscape

For a dullish January day, the quality of daylight seemed exceptional nearly everywhere, with frequent and varied views to allow easy orientation. The external greenery is still attractive, especially the sedum roofs which remain colourful even in winter, and the rain-holding pond with its rushes and water plants among which lurk a few moorhens. It was the worst time of year to see the plane trees in the *place* or the fruit trees near the restaurant, to register the difference between mown lawn and the rougher areas of meadow cut just twice a year, but the landscape is evidently conceived as a garden, well tended and lacking expanses of loveless tarmac. Some coloured tarmac is reserved for the central *place* where the patter of feet is greatest.

The head, who has been present at the school from the beginning, confirmed that the low-energy performance has been sustained, and admitted that his initial fears about potential building failures – prompted by

8. Section through the vocational teaching block, showing a variety of elements and changes of scale, with pitched roofs stepping down in vernacular fashion
9. The polygonal school library with its apical skylight and generous windows beyond. The roof structure is composed of glulam beams with a minimal use of steel for the ties. Artificial light is switched off because daylight suffices
10. Looking out on the *place* from the reception: good eco-performance does not preclude floor-to-ceiling glazing
11. The pupils' common room just south of the entrance, with vocational teaching blocks beyond: an unusual room with a corner bay, larch cladding and a sedum roof
12. Facade drawings of the same room and the basement entrance show Kroll's collage-like approach to materials

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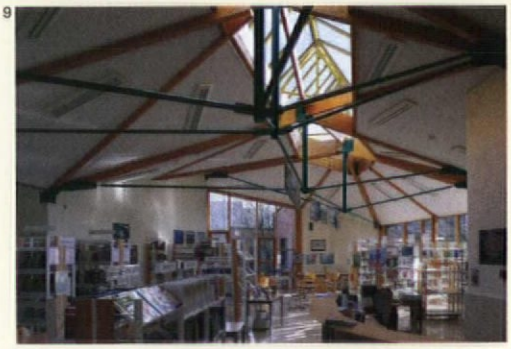

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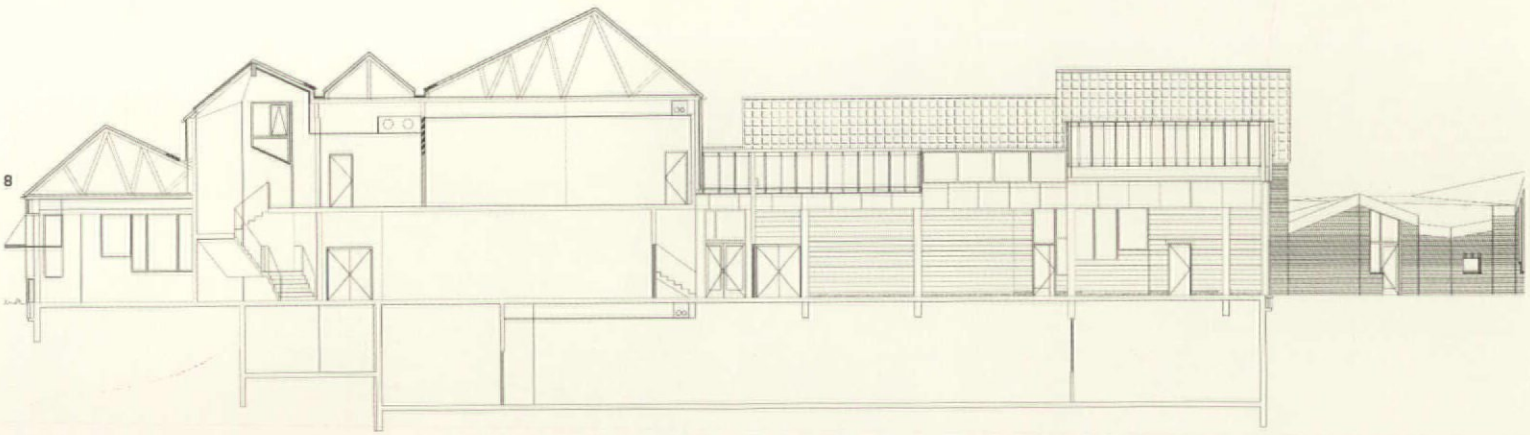

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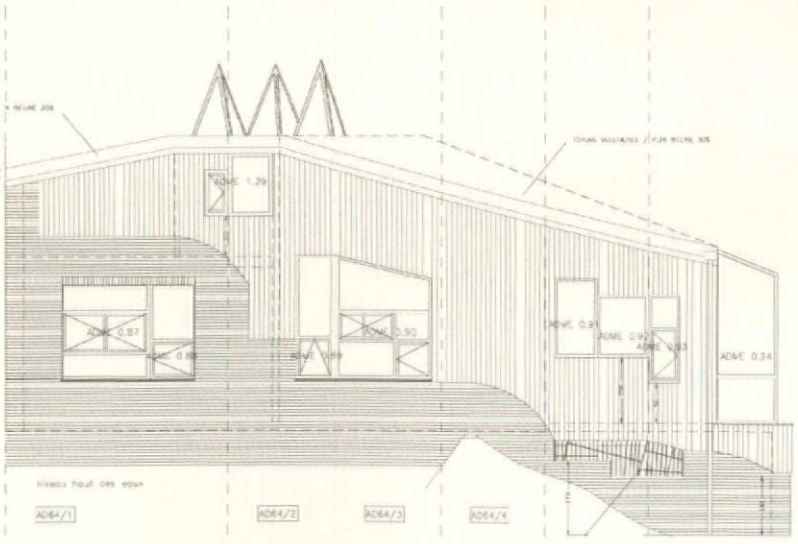

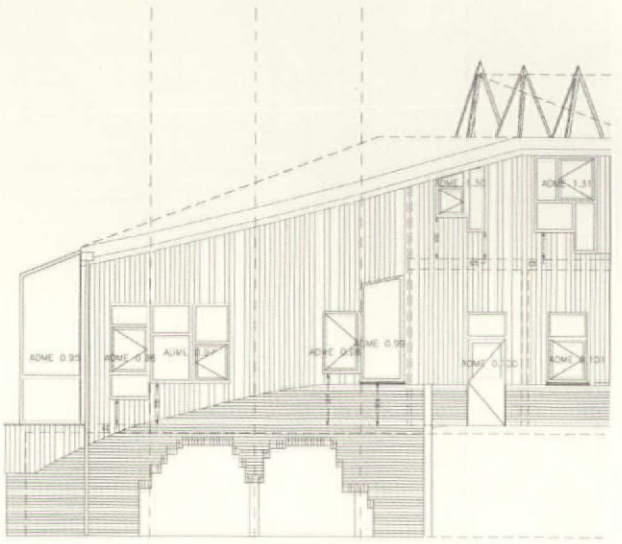

the complex shapes and varied materials – had proved unfounded. He claims the school has a happy atmosphere, which is evident from the way the pupils respect and care for the building, and while I was there the pupils seemed consistently relaxed and well-behaved. The head offered lunch, and we ate the same excellent three-course meal as the pupils, sitting and chatting with teachers, concierge and kitchen staff, with an evident sense of equality. Longer-serving staff members take the school for granted and sometimes grumble about details: why have science labs on three levels then have to carry materials up and down in a lift? But those who have taught elsewhere are consistently impressed, and the head confesses he would hate to return to 'an ordinary school: the concrete, the blind corridors'.

He is proud that the rain collection has proved so adequate for the grey-water system, drastically reducing dependency on the local water supply, but regrets it gives him no economic advantage on paper. Moreover, although the artificial lake has become a model biotope, the fully prescribed French national curriculum does not allow its educational exploitation. In a few places, teachers and pupils have added plants, but the role of the building in deliberate ecological education is not a strong theme. The rigidity of the curriculum is felt in other ways, particularly the reduction of the beautiful music room to a store. As music is not a curriculum subject, it awaits the enthusiasm of a dedicated teacher prepared to work for free outside hours. The head also has some grumbles. Neither the solar chimney on the administrative wing nor the Canadian wells precooling the air of the classroom blocks cope adequately with prolonged heatwaves, and the temperature of the upper classroom corridor, fully glazed for the sake of daylighting, can become excessive (the one in the second phase was given fixed shades to south). When the school is closed for Christmas, it can take days to warm up due to the thermal flywheel effect.[9] And while he appreciates the virtues of polygonal rooms for library and restaurant, the head criticised the use of non-rectangular spaces for working rooms such as kitchen and stores, showing me places where racks do not fit, though it may have been beyond the architects' control.

A question of style

For pupils, staff and parents, the school's appearance has long been accepted as normal and it fits easily into the town, but for architect-outsiders its style is controversial, offending rationalists and minimalists alike. So despite the building's record-breaking eco-performance, only one French architectural journal published it, and then on the insistence of its editor against the protest of colleagues. Kroll has always been anarchic, sceptical, even something of a Belgian surrealist in his humour, but he has argued his case articulately over a long period and deserves to be taken seriously.

Part of the style problem is that the school is very difficult to photograph, since the important central *place* does not figure except from above, the flow of space is hard to catch, perspectives are distorted by the un-right angles, and more views are needed to show the school's riches than can possibly be printed. There is also the old problem of

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13. Day-lit classroom in the academic teaching block, as seen from the window side looking towards the top-lit central corridor. The projecting bay both increases light levels and makes the corridor more street-like
14. Morning sun in a classroom of the vocational teaching block and another behind, with a view of the Arts tower beyond
15. Daylighting section through the academic classroom block, showing how the fully glazed central corridor provides secondary daylight to both levels of classrooms
16. Upper level of the sun-lit street-like central space, also showing the duct of the ventilation system
17. Views across the central street allow glimpses into classrooms

attention being drawn to details, which in real life seem of minor importance.[10] Yet the architectural world has come to depend on photo-like images to the exclusion of all else, often re-cooked in Photoshop with the lighting and colour 'improved', and therefore even further removed from reality. Traffic in images has displaced real experience, and the skill of reading plans and sections to reconstruct a place in your head, necessary in the days of more restrictive media, is becoming a lost art. Recorded images even dislodge individual memories of a place, for as you gaze at them, you reconstruct and replace your internal vision.

After initial enthusiasm for the HQE, Kroll is disappointed. Despite the achievement at Caudry, he and his team did not get another commission, and the intended follow-ups of the school's performance were dropped for lack of interest. There have been HQE projects by others but the programme has been watered down, and it is easier to appear green with a few stuck-on solar panels and wind-turbines than to work through all 67 criteria and their hidden impacts. 'How can we tell what difference it makes to avoid toxic materials?' asked the head. But for the outside world, the example of the Caudry school is a challenge, demonstrating what is possible and the kind of measures we should surely be taking for the sake of the planet. I am left with the impression of a friendly and successful school, generous in daylighting and views, excellent in its place-making, but essentially normal. Only on reflection did it occur to me that there are no real signs of strain and sacrifice in having to conform to a rigorous ecological agenda.

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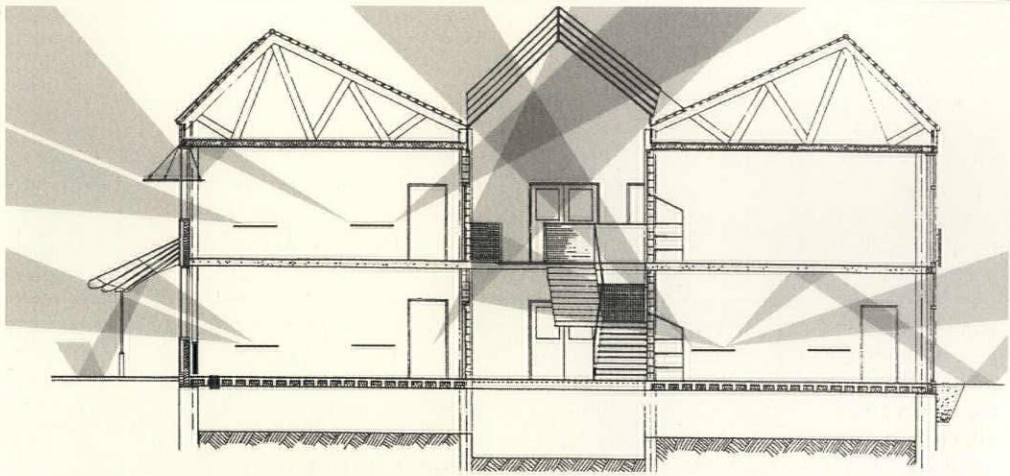

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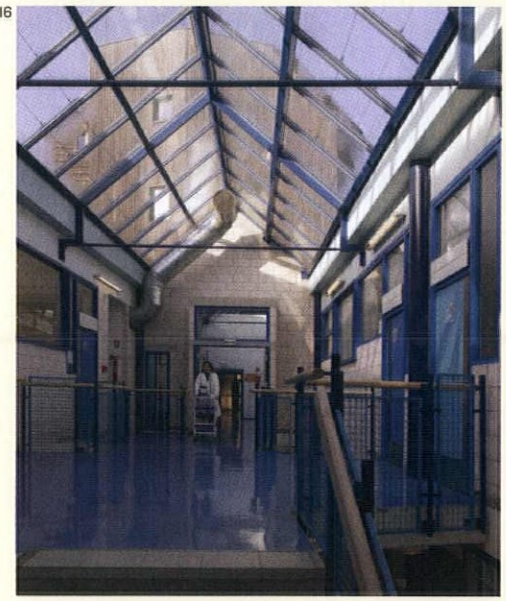

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1. Pupils aged 15 to 18, studying both academic subjects for the Baccalaureate and technical vocational subjects, on a co-educational basis.
2. See Stuart Maclure, *Educational development and school building: aspects of public policy 1945-73*, London, Longman, 1984.
3. See Roger Ulrich, 'View through a window may influence recovery from surgery', *Science*, vol. 224, issue 4647, 1984, and his later writings.
4. With the establishment of standards, a lux value on the work surface became mandatory, despite the fact that the eye can operate in a range of conditions, from candlelight to full sunlight. Light's variability then turned from a pleasure into a sin.
5. See Lucien Kroll, *The Architecture of Complexity*, Batsford, London, 1986.
6. Ibid. Kroll's argument was always that modern planning methods led to too much simplicity and repetition, and therefore we need variety and diversity for their own sake, not only to fulfil current and specific demands. If you are put in a row of identical houses, it takes courage to repaint your door: if the doors are already different colours it is much easier.
7. *Place* in French is the usual word for a market place or a public court, which we are obliged to call a town 'square', whether it is square or not. Place in English is more abstract and general, and sometimes the language borrows the Spanish *plaza* or the Italian *piazza*.
8. Judging by his earlier work, particularly the school at Belfort, Belgium (AR March 1987), Kroll would have liked the school and its *place* to be part of the public realm, but the current universal mania for security puts that out of the question, the whole school being fenced with locked gates.
9. All these effects of temperature extremes of course affect other buildings and are hard altogether to avoid, prompting the question of how much it is worth adding measures for how few days. These fluctuations also prompt more fundamental questions about bureaucratic norms and whether achieving a standard constant temperature summer and winter is a socially desirable goal, even when disregarding the energy costs.
10. The 'pot of paint problem'. If you visit and photograph a nearly finished building, you hardly notice the odd pot of paint lying about because there is so much else to see, but in the photograph it stands out immediately, like a sore thumb.

RORY HYDE

THE BIG RETHINK
FAREWELL TO MODERNISM

This second essay in the series decries Modernism for its betrayal of our essential humanity, and puts the case for why this must be regained to achieve true sustainability. Starting with Modernism's un-sustainability – not least in its reliance on fossil fuels – it examines the forces bringing modernity to an end. In an emerging epoch based on a vision of a 'living, organic universe', architecture must start again to mediate our relations between nature, place and community.

PETER BUCHANAN

Author's note

Although the Big Rethink is concerned with expanding our understanding of sustainability, there will be little discussion of the details of green design, not least because this can be found in abundance elsewhere.

The many critical comments about current architectural 'theory' do not define theory per se as problematic. Rather the problem is the sort of 'theory' taught in academe and published in turgid tomes, which compounds the problems that we face, displacing and even blocking the exploration and embrace of far more relevant and topical fields of study and modes of thought.

Finally, some will assert that the views expressed here are only opinions, and moreover those of a single individual; cognisant of such criticism, next month's essay will introduce a conceptual framework that ensures inclusivity and rigour.

Yet there is another way of assessing the value of ideas, and that is to ask: will acting on these ideas, as if they were true, result in better architecture – more richly conceived and relevant, more resonant and inspiring – and enhance the capacity to conceive of and create it? After all, why did certain famous architects, such as Le Corbusier, adopt new names? Not because they were true, but because living up to them inspired great architecture.

Last month's essay concluded by asserting that the urgent quest for sustainability spelt the end not only for Postmodernism, but also the termination of, rather than a return to, Modernism. If the former is not disposed to effective action (for reasons to be explored next month), the latter is unsustainable to its core. This month we start our investigation of the latter claim by exploring some key aspects of the unsustainability of modern architecture, recognising this belongs to the final, climactic phase of modernity – the era that started with the Renaissance and emergence of science. (The fundamental unsustainability of modernity, which further compounds that of modern architecture, will be explored in a later essay.)

First, a caveat: although the downsides of modernity and postmodernity are a major topic of the Big Rethink, both cultural paradigms have also brought great and lasting gifts. Not least of these are the vast amount of knowledge and potent technology modernity bequeaths us to use more wisely than it did. Indeed, both phases were very necessary and unavoidable parts of our socio-historic evolution. Despite now having to heal the fragmentation of our cities wrought by modern architecture, it too has brought its share of masterpieces and conceptual breakthroughs to be selectively carried forward; even Postmodernism has important lessons that should inform a future architecture. But both modernity and postmodernity are now played out, their benefits overshadowed by their negative aspects.

Comparing and contrasting Le Corbusier's villas

To begin this investigation of modernity's inherent unsustainability, let's start by comparing a pre-modern work of architecture with a modern one. To add spice, let's select houses by the same architect in different phases of his career: the Arts and Crafts (some would say proto-modern) Villa Fallet (1906-07) by Charles-Édouard Jeanneret, and the heroic, high modern and Purist (some would say, International Style) Villa Savoye (1928-31) by Le Corbusier, as he by then styled himself. The contrast is not as extreme as between, say, Heidegger's Hut and Mies' Farnsworth House, but is enough to make some key points.

Probably the most obvious contrast between the villas is in their forms: Villa Fallet is traditional and highly ornamented whereas Villa Savoye is abstract and stripped of decoration. But the next most striking difference is between the range and nature of materials. Typical of its time, Villa Fallet displays a broad palette of materials outside and in, many of them 'natural', and these have aged gracefully. Approaching and entering the house, these are encountered sequentially, according to contemporary notions of decorum. By communicating how close you may come to them, they convey a hierarchy of public and intimate space, and also help articulate the character and relative importance of each room. The rough stone base outside forbids people getting too near; the smooth plaster in the entrance porch welcomes the body.

Villa Savoye, by contrast, displays a limited range of materials, the same or very similar used inside and out, emphasising continuities of space and behaviour. Imitating the smooth surfaces and forms of ocean liners, which similarly float free from context, these materials conceal the true nature of construction. With its plain surfaces and generous spaces, the house 'hangs back' from its inhabitants in a way that is liberating yet defies intimate engagement with its materiality. Attempting to stand outside time, the house neither aged nor weathered: it merely cracked and deteriorated.

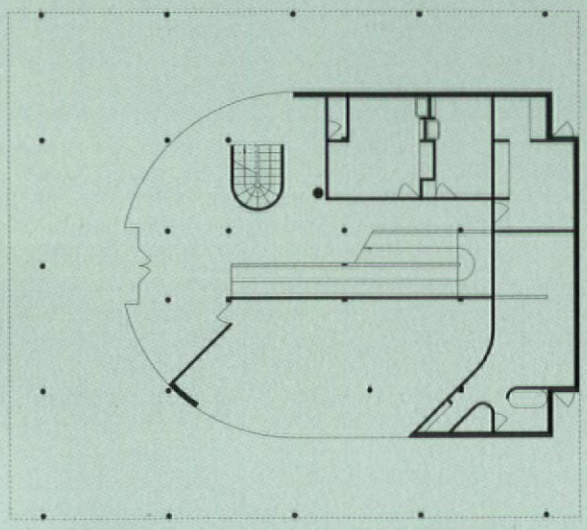
Villa Fallet's materials and forms act to differentiate. Together with an interior compartmentalised into rooms cluttered with furniture and decoration, they articulate the space through disjunction to constrain behaviour in accord with contemporary custom. But Villa Savoye's sparsely-furnished, generously-scaled spaces emphasise continuities of material and spatial flow, and a concomitant exhilarating, fluid flexibility and freedom to the activities housed. Disencumbered of the clutter of heavy furniture and ornament, behaviour could be spontaneous and take on an epic quality, resonating as if played out against a blank cinema screen. Yet even here decorum is subtly indicated, for instance through private areas reached by turning clockwise against the anti-clockwise flow of the communal spaces, as well as the cruise-ship casual chic conveyed by the nautical associations, including ramp as gangway and so on.

Yet Villa Fallet's interior discontinuities are reintegrated under the embrace of the roof, as its exterior forms, materials and ornaments suggestively imply multiple relationships with its setting. The heavy stone base draws up the earth and, with the transition to light, incised plaster above, speaks of gravity. So too does the steep overhanging roof that reaches up to the sky, its form suggesting the shedding of rain and snow as it snuggles against cold winds, while also opening up to the sun and views. And the decorative motifs of glazing bars, balustrades and incised plaster echo the surrounding conifers. The house thus weds earth and sky while also establishing harmonious relationships with neighbouring homes and nature. Architecture was still conceived of as embedded in a rich and complex web of relationships – social, cultural, ecological and so on – and the materials and their use played a crucial role in communicating this concept. Time, too, was considered in the way the materials weathered and stained.

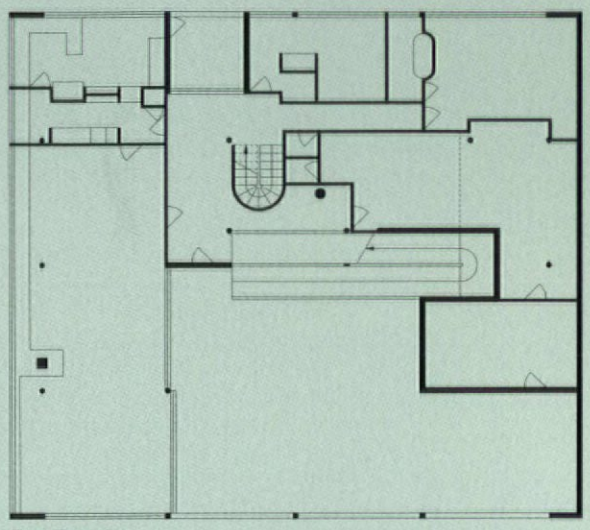
Villa Savoye is an antithesis, self-contained and selfish, a singular object hovering above but not engaging with its setting, its pristine forms denying and so vulnerable to weathering and time. It opens up only to the sun and sky while the horizontal slot, partly glazed and partly unglazed, both distances and intensifies the view of the horizon. The fluid interior-exterior space is bounded within the box-like perimeter that floats free above the ground to emphasise the disconnection from context and nature. Indeed, the building appears to stand on tiptoe, recoiling from nature, like those old cartoons of women on chairs shrieking 'Eeek!' on seeing a mouse.

On entering, the first thing encountered is a wash-hand basin at which to quickly remove any of nature's contaminating dirt. This was, of course, only a brief phase in Le Corbusier's oeuvre, and the post-Second World War houses, such as Maisons Jaoul, are earthy and earth-bound. The attitude displayed to contamination is

1. A singular, hovering object in the landscape, disinclined to engage with its setting and ultimately vulnerable to the vicissitudes of time, Le Corbusier's Villa Savoye perfectly epitomises the inherent physical and psychological unsustainability of Modernism



ground floor plan



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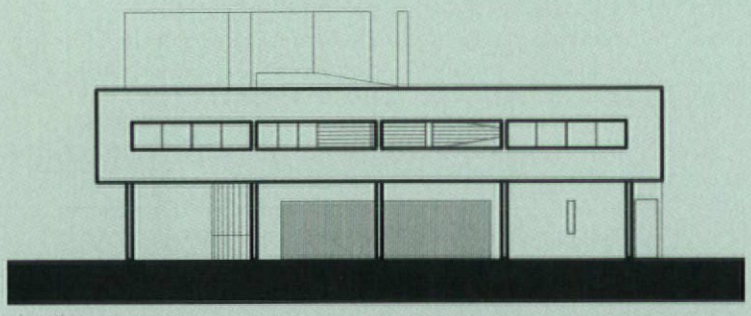

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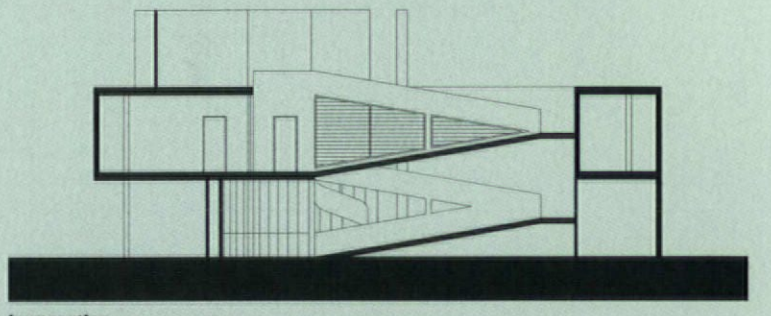

long section

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CORBIS

2. The fluid space of Villa Savoye (1931) is bounded by a box-like enclosure that emphasises the dwelling's sundering from nature and place. Like many key modern houses, it is an isolated holiday home on a rural site, dependent on fossil fuels to make its materially insubstantial architecture habitable, and also to make possible the regular weekend commutes of its occupants. This egotistical sense of hubristic disconnection, of humans prevailing over nature, has consistently underscored the modern era

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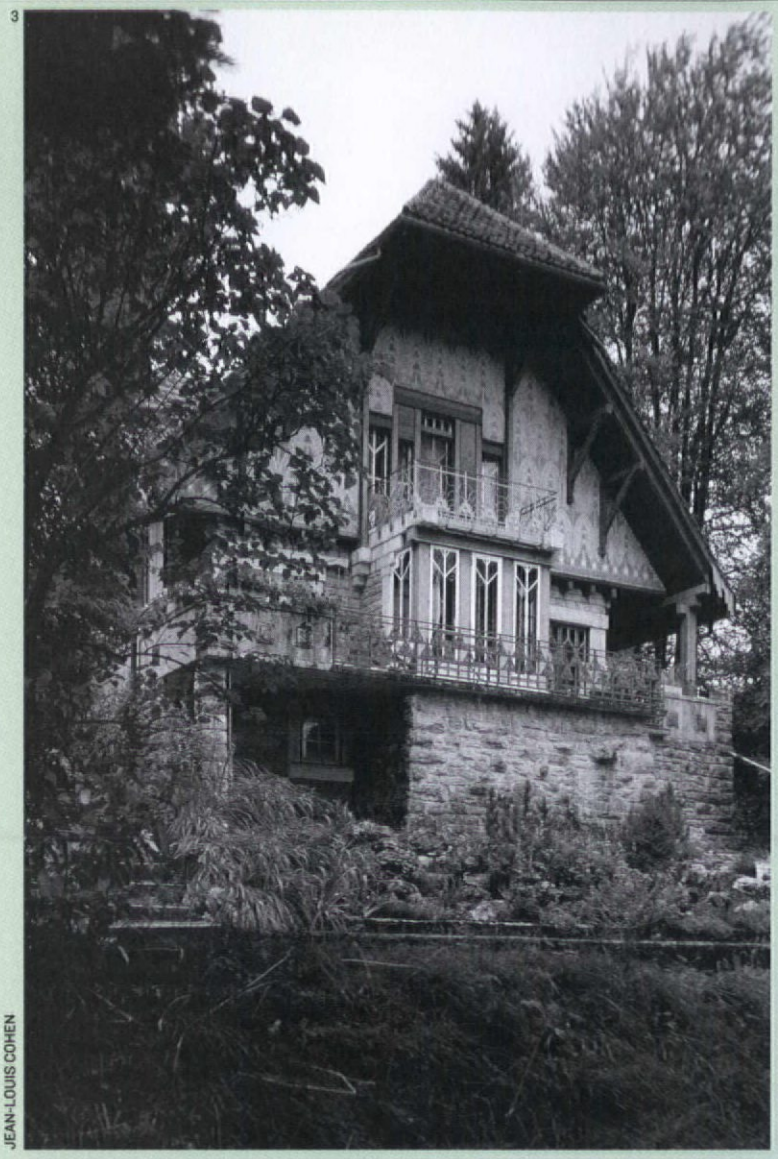
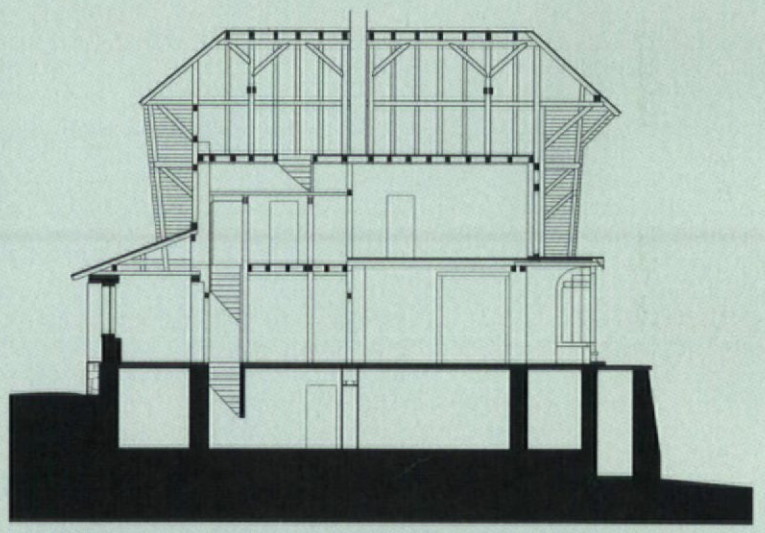


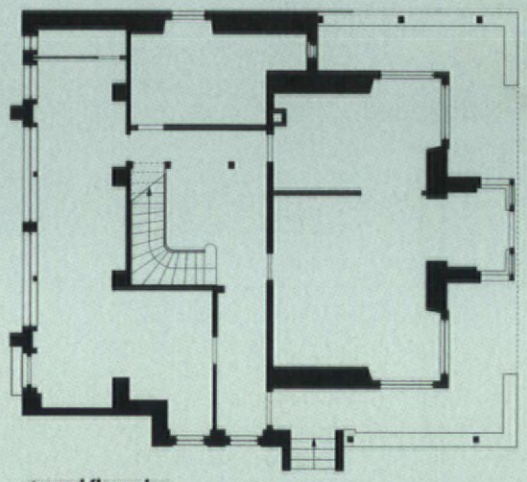
JEAN-LOUIS COHEN

elevation



long section

3. Designed in a gentler, more traditional Arts and Crafts idiom, Villa Fallet (1907) employs a broad palette of materials which have weathered gracefully over time. A robust stone base roots the house to its site, while establishing a considerate relationship with its surroundings. Rooms are encountered sequentially, according to notions of decorum, and convey a legible hierarchy of public and more intimate domestic spaces. Architecture is conceived of as embedded in a rich and complex web of relationships



ground floor plan

nothing like as extreme as with the sterile and joyless paranoia of Alison and Peter Smithson's 1956 House of the Future, as described in last month's review of the Canadian Centre for Architecture's exhibition Imperfect Health: the Medicalization of Architecture (AR January 2012). The naval forms emphasise this floating disconnect – although, this being a Corbusian masterpiece, there are also allusions to Palladio's Villa Rotunda, its dome fragmented into a Cubist collage of curved walls, and the statues of gods on the entablature replaced by a live frieze of humans, of elevated status of course, framed by the near continuous horizontal slot.

Taking the long view of 'the oil interval'

So what accounts for the differences between these villas? Specifically, what new material facilitated the profound shift in forms and sensibility? What do the history books say? Reinforced concrete? Plate glass? The answer is neither of these, nor any of the other usual explanations, but abundant and cheap fossil fuels. These powered the weekend commute to the house and kept warm in winter the large, flowing spaces enclosed in thin un-insulated concrete walls and slabs, with vast expanses of single glazing. It was also a related material – and later, oil derivatives – which waterproofed Villa Savoye's and all other flat roofs and terraces. Later too, petrochemicals provided the neoprene gaskets, epoxies, mastics and sealants, as well as the synthetic carpets and fabrics. And it was fossil fuel-derived electricity that lit and air-conditioned modern buildings, which often spurned natural light and ventilation.

Modern architecture is thus an energy-profligate, petrochemical architecture, only possible when fossil fuels are abundant and affordable. Like the sprawling cities it spawned, it belongs to that waning era historians are already calling 'the oil interval'. Although histories of modern architecture still overlook this critical fact – failing to note what is, literally, blindingly obvious – any future history must surely begin by noting this relationship, which is axiomatically unsustainable.

With its disconnect from nature and neighbours, its material fragility and the frieze of people partying or doing calisthenics displacing the statues of gods on the classical entablature, Villa Savoye emphasises a related flaw at the core of modern architecture and modernity in general: the hubris, turbocharged by fossil-fuelled technological power, and a corresponding lack of acknowledgement, even denial, of our ultimate dependency on nature, its cycles and regenerative capacities. Archetypal modern man and woman preferred – and still prefer – not to be rooted in place or community nor to be concerned with the longer cycles of time and the obligations they inevitably incur.

The modern and contemporary built environment, and their corresponding lifestyles, are only possible because we do not live within the capacities of the Earth's ambient energies and nature's annual bounty but instead each year burn up a legacy accumulated over millions of years. As the title of Thom Hartmann's famous book so poetically puts it, we are living on 'The Last Hours of Ancient Sunlight'. Yet already as a student in the 1960s,

'Modern architecture is an energy-profligate, petrochemical architecture, only possible when fossil fuels are abundant and affordable. Like the sprawling cities it spawned, it belongs to that waning era historians are already calling "the oil interval".'

I was aware of Buckminster Fuller's injunction that we recognise fossil fuels as a 'one-time evolutionary gift', the only legitimate use for which was to create the means to harvest what we now call renewable energies. Even the food we eat is the product of oil rather than nature. Very many times more oil-derived calories are used to produce and distribute it – in artificial fertilisers, pesticides and herbicides, tractor and transport fuel, plastic packaging and refrigeration – than it yields nutritionally, only one of many ways modern agriculture is utterly unsustainable. Adapting food provision to escalating oil prices will lead to immense challenges – and inevitably to profound changes in how we live on and with the land.

Getting to the root of the problem: mobility

The hubristic disconnect and denial of dependencies is clearly summarised by Villa Savoye. Modern mankind has been said to be merely picnicking or camping upon the Earth, thereby escaping what were seen to be the constraints of custom, culture and community – neither properly settling, nor even taking away the rubbish – most of it created unnecessarily (all that packaging and so on) and all of it treated as an 'externality' for others to deal with. It is little coincidence that many famous modern houses were isolated holiday homes – Villa Savoye, Fallingwater, Farnsworth House – and many of the buildings in FRS Yorke's canonical 'The Modern House' (AR December 1936) are also holiday homes. Like their more famous counterparts, many of these perch on stilts or cantilever over their sites.

Inside the modern house, the light, mobile modern furniture derives from that used on holidays – deck chairs and other folding equipment. These in turn were derived from the furniture used by the military and later by colonial administrators on safari. Military conquest through technological superiority and colonialism were further hubris-inducing enterprises that inspired aspects of modern architecture and design, largely initiated by colonial powers – France, Britain, Germany, the Netherlands. And from the colonised came many aspects of modern life, such as lighter and less constrictive

clothing befitting the more spontaneous and relaxed lifestyle seen as concomitant with modern architecture.

Recognising modern architecture's antecedents in colonialism and conquest raises questions about how benign or psychologically healthy is the tendency to merely camp without establishing deep roots. Mobility and modernity are virtually synonymous. Particularly in the UK and US, a house is not a home but an investment and stepping stone until something better can be afforded. But can we achieve sustainability without being settled? Without treating our setting, the surrounding bioregion and its climate, customs and agricultural produce, and even the planet and its biosphere as home? Without being rooted in place and responsible for the stewardship of that place? These are pressing questions to ponder when rethinking architecture and the city, our lifestyles and cultures. An equally important and related question is: can we be fully mature humans without being settled? A modern ideal was to be 'a man or woman of the world', always on the move and at home everywhere. But now we see universality, the unfolding into full humanity, as being achieved through depth, which comes in part from being rooted in and concerned for place and community.

Partly inspired by Villa Savoye and other holiday houses, as well as holiday pursuits such as camping and yachting, there still persists a long-enduring and now pernicious myth in architecture – found at its most pathological in High-Tech, to which a few architects cling nostalgically – that a light, and preferably hovering, building is more gentle in its impacts on nature and its setting. This was excusable in the days when Buckminster Fuller, who defined his mission as using minimal material to bring maximum benefit to the majority, famously asked: 'Madam, how much does your house weigh?' But to ask the same question today about a Norman Foster building, as in the title of a recent documentary film, is simply silly.

Integrating 'externalities' into architectural thinking

Total life-cycle costing, a key discipline in sustainable design, requires that we understand efficiency and ecological impacts in a very different way to modernity. This dismissed much of its negative impacts (particularly those of industry and corporations) as mere externalities or collateral damage. Now we understand that what is critical is not the efficiency, lightness and strength of a material or component when in place: it is the total amount of material extracted from the Earth and the disruption caused by this, as well as the energy and pollution from transport and manufacture, and then the costs and impacts of eventual recycling or return to the Earth. Thus what were once seen as highly efficient high-tech materials or components are now seen to be very inefficient – indeed, with building, it is almost the rule that the more efficient the product when in place, the less efficient it is in process terms. For real efficiency, as the concept is now understood, nothing can beat mud and thatch, although Walter Segal's timber self-build system scores highly as do traditional tropical construction techniques in materials, such as bamboo and palm-frond matting – which might be lightweight but are natural, local and renewable.

Design for sustainability will thus inevitably be centred on the shaping of processes, such as flows of material and energy, as much as on the eventual products. This requires vastly expanding the temporal and spatial range of the designers' concerns to include the total life-cycle costs mentioned above, which would typically span decades, and the global impacts of, say, using a material in short supply, which might have profound consequences on the other side of the planet. What are now dismissed as mere externalities for others, usually the taxpayers, to deal with, must now all be factored into the design process. Miniaturisation and ephemerality can be very destructive, as evidenced by the horrendous and too little publicised consequences of mining for rare earth metals used in computers, cell phones (of which Americans discard 130 million a year) and other electronic equipment, such as that used in monitoring and adjusting conditions within buildings.

All this will profoundly influence the design and making of architecture. And just as green design has already elevated the status of the services engineer as a key creative member of the design team, so too will it lead to the inclusion, as another key creative discipline, of production engineers, who are devising more efficient and benign ways of manufacturing materials and components. Particularly important is to devise less energy-intensive and toxically-polluting methods of manufacture – hence the importance of biomimicry's study of how nature creates high-performance materials, such as spider webs, at low temperatures with no pollution. It is a tragic paradox that modern architecture – which originated in buildings like Villa Savoye that promised a new, more healthy life of sun and fresh air in conditions of near-sterile cleanliness – should lead to buildings whose interiors are so poisonously unhealthy, with highly toxic off-gassing and abraded chemicals, as well as tinted glass and artificial light that inhibit the synthesis of Vitamin D and consequently cause a rise in its deficiency-related diseases.

Connecting with the larger realities of an essential humanity

The indigenous peoples of North America, when confronted with major decisions, would ask: what will be the impact of the action under consideration on the next seven generations, as well as on the legacy of the seven previous generations? Like many pre-modern peoples they viewed their lives and actions within a vastly greater time span than the short-termism that dominates today's business and political electoral cycles, and were acutely sensitive to the consequences of these for ancestors, descendants and Mother Earth. This is the true role of culture, to shape and keep alive the narratives and rituals that connect us to our place and peoples, to the planet and the long march of history and time, so giving meaning to and guiding our lives.

But modernity suppressed this dimension of culture, while modern architecture attempted to break with history and its outworn rhetorical forms and motifs. Stripped of obvious historic associations, Villa Savoye's allusions to a classical past were only there for a select few, those whom Le Corbusier referred to as having

'eyes that see'. Otherwise, the villa is a 'machine for living in', a compliant gadget in service to a hedonistic, live-for-the-moment lifestyle. In utter contrast, a pre-modern building is a cultural artefact, repeating and reworking forms loaded with historic significance so as to connect us with history while also addressing the future. Such architecture is not merely subservient, but mediates between us and both culture and nature, and so roots us within these contexts.

We cannot achieve sustainability without re-establishing this multi-dimensional sense of connection to and relationship with larger realities, and the meanings and deep psychic satisfactions that this brings. In this light, it is significant that two forms of psychotherapy with rapidly expanding followings are ecopsychology, which attributes much mental malaise to our culture's pervasive and increasing disconnect from nature, and Bert Hellinger's Family Constellations, a type of group therapy that powerfully revivifies, by bringing into consciousness, our profound and too often unacknowledged connections to our ancestors. The rebirth of culture is among the greatest and most exciting projects of our age, a collaborative enterprise that will take time and the contributions of many. But contrary to what many say – particularly Postmodernists – the great, inspiring, and even spiritual, narratives are already there to be used as a foundation. They are to be found in, among other things, the cosmological unfolding that relates us back to the original fire ball of the Big Bang, in evolution and ecology that connects us with all other living things, to anthropology and depth psychology that tell us about the cultural and community connections that help us unfold into full humanity.

Regaining the humanity betrayed by modernity

These narratives and the deep scientifically-based understandings underpinning them are among the greatest legacies of modernity. Yet they are also among the most potent agents undermining the reductionist assumptions on which modernity is founded. More than that, the knowledge and wisdom they bring, as well as the psycho-physiological techniques (from various forms of therapy, Neuro Linguistic Programming and so on) that have emerged to reconnect us with others and the larger world while healing what is pathological in those connections, face us with a challenging responsibility. That is nothing less than to apply the gifts bequeathed by modernity to, for the first time, consciously participate – not by imposing our will, but by working in harmony with what these narratives reveal – in shaping our destiny to bring about a sustainable society and environment. And these will be sustainable not least because the concomitant cultures and lifestyles will offer the deep psychic satisfactions of a meaningful life – rich in connections to nature, place and community, and the responsibilities that go with those – in which we can each mature into and express our full humanity.

Ultimately this series is concerned with returning the human subject – and his or her unfolding into the fullness of humanity in line with emerging understandings of what that means – to its correct and central role in architecture after being displaced from there by reductionist ideas like Functionalism. This was concerned only with activities as viewed detachedly from outside, and ignored our rich internal worlds of experience, psychic connections and meanings. Put in these terms, modern architecture was a huge betrayal of our essential humanity – an extreme statement that is not without much truth.

But before exploring such matters further and discussing what they mean for the future of architecture, we need to understand where we are historically and the deep, seldom-discussed, forces that brought us here (next month's subject), as well as those now impelling us to move forward by bringing modernity to an end. We shall touch on the latter first and briefly summarise a few of the most potent of these forces that are also opening a new era in which ideas such as regenerating culture will be recognised as relevant and realisable. These are mostly, or could be usefully seen as, the 'carrots' that complement last month's 'sticks', although some of them are exactly the same forces.

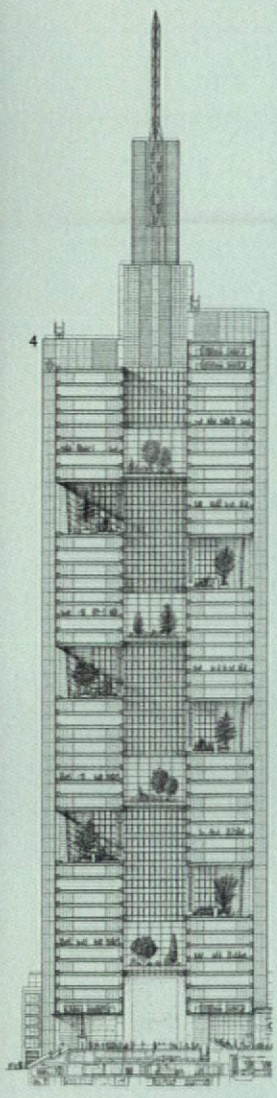
Focusing on 'quality of life', not 'standard of living'

The environmental crisis, for instance, is most definitely a 'stick' that should be, but is not, impelling urgent action. In part that is because the crisis has not been understood to also be a 'carrot'; or if it has, environmental activists mainly focus on the 'stick' aspect – for good, if counter-productive, reasons. But within the threat of catastrophe also lies opportunity, not least because people become more open-minded when they realise that radical thinking and action are required urgently. As the study of biological evolution, history and psychology makes clear, major crises (what biology and systems thinking call bifurcation points) lead to either breakdown or break through. We are currently poised between these options, frozen like rabbits in car headlamps when confronted by the enormity of the environmental problems we face and the seeming intractability of mobilising effective action – and some still even deny there is a problem. The challenge we face is to make a huge evolutionary step forward to a very different cultural paradigm (or cultural ecology, as some prefer) beyond modernity.

The best answer to climate change deniers and sceptics is that if the threat it poses proved unfounded it would be both a relief and a disappointment. We would be losing the impetus to make a huge evolutionary leap.

'Society and environment will be sustainable not least because concomitant cultures and lifestyles will offer the psychic satisfactions of a meaningful life – rich in connections to nature, place and community'

4. Section through the Commerzbank Tower in Frankfurt by Foster + Partners showing the sky gardens dispersed throughout the structure. These allow more natural light to penetrate the interior, reducing the need for artificial sources and cultivating a general sense of well being. Despite its scale, Commerzbank was one of the first genuinely 'ecological' skyscrapers



Here the rhetoric and actions of many environmentalists are counter-productive, for two reasons in particular. Many tend to be preoccupied by single issues, often seeing these as related to one cause, and propose single solutions. Such thinking is profoundly un-ecological: ecology is concerned with complex, interacting webs of relationships, not straight-line cause and effect. Maybe even more problematic, environmentalists have a habit of articulating only the problems, real and pressing as they are, and advocate constraints, such as limiting energy-consumption and emissions. Although these constraints are necessary, to focus exclusively on them and the problems they ameliorate is disempowering and dispiriting. Instead, or as well as, we need to be inspired by a vision of what is possible, of what might go along with cuts in consumption and emissions: the leap to a saner and more satisfying culture based on the switch from a focus on standard of living to quality of life. (Seeing the latter two as synonymous was a major flaw of modernity.) Quality of life is a product not of isolation and disconnect but of enjoying the beauty and grace, the satisfactions and meanings of living in deeply aware connection with place and community, nature and planet.

Many studies show that a higher standard of living (above a baseline necessary for dignified life) has not brought happiness, and also that quality of life is not dependent on excessive consumption. Among the great problems of our time, especially in relation to environmental and economic problems, is a desperate lack of creative imagination in conceiving of and articulating a pragmatic yet inspiring alternative vision as to what the good life would be. As well as a certain standard of living and long-term security, this would bring deep happiness and satisfactions through connection and communion with all aspects and forms of life, and a deep sense of purpose. Meeting this exciting challenge is fundamental to achieving sustainability and why we need to see the environmental crisis as a carrot as well as a stick.

Green buildings alone improve the quality of life. People prefer working in naturally lit and ventilated buildings, as evidenced in lower staff turnover and less absenteeism, the latter in part because green buildings are healthier. People also prefer controlling their own comfort conditions, as operable windows allow. Researchers have found many workers happy with conditions considered outside normal comfort zones – if they chose and control these conditions. Also, many features introduced for energy-efficiency, such as naturally lit and ventilated atria, become lively social spaces and give a building a pleasing and recognisable identity. Moreover, green buildings do not exhale hot air from chillers and other mechanical equipment, and especially if they also have planted roofs, contribute markedly less to the urban heat-island effect. But these are only small steps in what must become a broader, city- and culture-wide transformation in which architects should play a leading role.

Closely related to the environmental crisis is the economic one that can also be seen as a carrot. Like modernity, many aspects of the current economic system are played out and need more than mere reform. They are the prime drivers of the destruction of the planet and their benefits are unequally distributed, grotesquely enriching a tiny elite and leaving a large minority in conditions of relative deprivation. Now the economic underpinnings of modernity are under threat and even collapsing, for reasons we shall explore shortly.

At the moment, in the developing world we are in a transitional phase that has had its architectural consequences. In *A Whole New Mind*, Daniel Pink argues that in Europe and America we are leaving the Industrial and Information Ages to enter the Conceptual Age. Our Industrial Age ended as factories moved to exploit the cheap yet skilled labour of the developing world, leaving empty industrial areas to be redeveloped as housing and business parks – and some old factories, power stations and other industrial works converted into galleries, theatres, concert halls and so on.

But if moving manual factory labour to the developing world helped bring the Information Age, the equally rote and nearly as drudge-like aspects of this are now also moving to the developing world: call centres, accounts, archives, records and simple software development – even legal advice and medical diagnostics. All these require linear, left-brain skills. This leaves the developed world to concentrate, until the developing world catches up again, on the right-brain, high empathy skills and pursuits of the Conceptual Age, notably those involving creativity, culture and caring. A well-educated, long-lived post-retirement population appreciates the stimulus of culture, yet also requires caring for – often by recruits from the developing world. In the globalised, Conceptual Age, cities rather than countries compete to attract the creative and highly skilled people on which their economies depend. Contributing to success here is quality of life, to which the socio-cultural and physical character of a city and its hinterland are also crucial factors.

The 'Conceptual Age' and the 'Third Industrial Revolution'

The advent of the Conceptual Age, with its emphasis on empathy and creativity, could be seen as a step towards a much more important transformation, what Jeremy Rifkin, in his book of the same name (see book review on page 97), calls the Third Industrial Revolution (TIR). Each industrial revolution is characterised by the confluence of a new energy system with a new mode of communication, these being analogous to the body's blood and nervous systems. The First Industrial Revolution used steam power for manufacturing and transport (the railways), and for mass-printing rotary presses. The Second Industrial Revolution (SIR) used oil to power transport (roads and motorways) and electricity – from coal- and oil-fired power stations (later some nuclear) – for industry and communications, from telegraph and telephone through to cinema and newsreels to television and faxes.

The blue- and then white-collar jobs of the First and Second Industrial Revolutions involved largely rote, drudgework and huge inequalities between boardrooms, managers and ordinary workers in pay, education, healthcare and so on. Both revolutions required massive investment in machinery and infrastructure. Financing this led to centralisation and the consolidation of power in a limited number of mighty corporations and financial

institutions. This investment was also heavily subsidised in various ways, from tax breaks to publicly-funded infrastructure, by the government and taxpayer. This is now all too often dishonestly denied by corporations and politicians decrying big government, over which business and banks nevertheless retain huge influence through lobbying and political donations. Indeed, the current economic crisis was largely caused by pushing this now deregulated (part of the denial of the government's role) SIR beyond any sensible limit and simultaneously obstructing the transition to TIR through lobbying and funding various spoiling actions. (Climate change deniers, opponents of renewable energy and so on are funded by the oil and nuclear lobbies.)

TIR – which the European Union was strongly committed to bringing about, before being distracted by the need to rescue some of its individual, debt-ridden economies – is very different. Energy is from distributed, ubiquitous renewable sources, with every building a micro power station, and the communication system is the internet. These will come together, using available and tested technologies, in what has been called the Smart Grid, which moves energy and information in both directions. Instead of centralisation it leads to a dispersal of power and instead of competition between a few, often near-monopolistic, corporations it leads to collaboration between a myriad of small businesses and individuals. And rather than living on the hubris-inducing powers of fossil fuels and wantonly extractive industrial processes, we will be living in harmony with the biosphere and its ambient energies. This must lead to greater awareness of them, their capacities and limits, and so to a more meaningful and improved quality of life.

The implications of all this for the built environment are enormous – as they are for all aspects of our culture, requiring the radical thinking of economics and education, for starters. Perhaps surprisingly, particularly to advocates of the Compact City, TIR may yet rescue the environmental legacy of the Second Industrial Revolution. To fly over the US, to take an extreme example, is to wonder how its lifestyle, with multi-lane highways filled with cars of single occupancy, commuting through sprawling 'cities' between air-conditioned buildings, could ever survive rapidly escalating oil prices once the global economy starts to recover. But maybe, with every building a micro power station storing energy with hydrogen fuel-cell technology that also powers cars, the future for such places is not as bleak as it once seemed. Maybe. Even so, there will be a painful transition period, protracted by the resistance of SIR corporations and the politicians they lobby and fund.

TIR will inevitably temper one of modernity's most destructive features, the unchecked and irresponsibly exercised power of giant multi-national corporations: many see the curbing of the corporate system as a fundamental necessity if we are to progress to sustainability. This had its initial origins at the birth of modernity, with the issuance of royal charters in the early 15th century when the Portuguese king licensed the exploration of Africa. It took a further step towards

5

Newtonian Mechanical Universe	**Living Organic Universe**
Static and deterministic	*Dynamic and evolving*
Space and time both absolute and separates	*Space and time are inseparable*
Universe is the same for all observers wherever they are in space or time	*Dependent on the observer*
Consists of inert objects with simple locations. Organisms within space and time	*Consists of de-localised and mutually entangled space*
Space and time linear and homogeneous	*Multi-dimensional space-time*
Primary truth	*Linear and heterogeneous*
Local causation	*Non-local causation*
Non-participatory, excluded and impotent entanglement of observer	*Creative and participatory*
Observer	*Observer and observed*

5. Comparative characteristics of the Newtonian and Organic Universes, derived from a table by evolutionary biologist Mae Won-Ho. In a radical conceptual shift, that has profound repercussions beyond the world of science, the familiar clockwork universe of Newton is giving way to notions of the universe as a complex, multivalent and perpetually evolving organism. The fixed certainties of modernity are now challenged by a new and more fluid cultural paradigm

their contemporary form considerably later when England and the Netherlands licensed their respective East India companies around the beginning of the 17th century. Besides initiating what we now know as globalisation, this issuance of charters was how the nobility retained power and profited from the rising mercantile class, and eventually led to the modern corporation as we know it.

A key feature of the chartered companies and today's corporations is they distance shareholders from the source of their wealth, and even awareness of how it is created. Thus seemingly honourable people once lived in good conscience off colonialism and slavery, and now off the most rapacious of extractive industries destroying the planet. Hence discussion in some of the Greater London Authority's documents about making London a sustainable city remains fatuous when the engine of its economy is the City of London (the banking and financial services sector). Yet the corporate system and the big banks that are part of it are attracting calls for radical reform – among the less threatening of which is to factor in and pay for resolving externalities.

The computer's place in the 'Organic Universe'

Far and away the most potent current agent of change is the computer. Initially this has supercharged the destructive impacts of the Second Industrial Revolution, not least by making it possible for vast sums of money to slosh instantly around the world with reckless disregard for local impacts or long-term consequences. At a more mundane level, the computer allows many of us to work from home. This has consequences for the design of the home, as a live-work unit in contemporary parlance, and for the life of the neighbourhood, leading to the burgeoning number of coffee shops and other local meeting and socialising places for home-workers wanting company. It is the computer that will also bring about the TIR, seemingly our best chance for achieving sustainability and living in harmony with the regenerative cycles and capacities of the biosphere. So although the computer has already had an enormous impact on almost every aspect of our lives, it has still to affect us in many more ways. Its advent is of pivotal importance comparable with the birth of the industrial revolution, and some say of even greater significance.

Every change discussed here has been powerfully influenced and even precipitated by the computer and the web of instantaneous communications it has facilitated. With internet access penetrating every corner of the globe, the web has provided Gaia with a nervous system so that each of us can be in touch with and informed about what is happening anywhere. Without the computer's awesome number-crunching and simulation capacities we could not grasp the complexities of climate change nor design the built environment to ameliorate it. Indeed, every aspect of the design, engineering and construction of architecture has been radically affected by the computer. This has brought great benefits but also challenges to our understandings of the very purposes of architecture and how we relate to it. These will be explored in a later essay.

Science, and the technologies it spawns too, has also been radically transformed by the computer. Many natural processes were either much too slow or far too speedy to be accurately perceived, analysed and understood. These are now easily modelled on the computer, adjusting different variables until a model is created that behaves just like the natural system under study. Thus fields concerned with taxonomy now also study complex dynamic processes of emergence. Moreover, the computer is not limited to studying the simple, linear chains of cause and effect that characterise Newtonian science but can model complex, simultaneous and multi-directional interactions between many ongoing processes.

Although the shift had been going on since long before, the advent of the computer gave further impetus to one of the most profound paradigm shifts in science: Newton's dead and mechanistic, clockwork universe is giving way to what is referred to as the Organic or Living Universe, which is understood to be alive, self-organising (autopoiesis), ever-evolving and constantly creative. (Some differences between the old Newtonian and the new Organic Universe are summarised in the table derived from one by evolution biologist Mae Won-Ho.) Science no longer only involves reductive analysis of isolated objects linked in simple causal chains but deals with multiple simultaneous interactions, with complex systems and the inter-relationships within and between them.

Moreover, we humans are no longer detached observers but, as implied in quantum mechanics, are to some degree integral participants in these systems and processes. This huge shift is a major reason for 400 years of modernity being replaced by a new cultural paradigm underpinned by a radically different science. Youngsters educated in this new science will not only understand the world intellectually in another way to most people today but will also have a viscerally different experience of it, as participants rather than mere observers. This will in turn profoundly impact on how we want to live. We defended ourselves against a meaningless, dead universe by walling ourselves off with consumerist goodies and addictive distractions. But once we understand and sense the cosmos is alive we will want to disencumber to better embrace and engage with this ever-evolving being.

Finding real meaning in human values

Already before this change in our subjective experience of the world, another major agent of change is also subjective: this lies in human values, or perhaps not so much in changes in them but in an expectation of living in accord with one's personal values. We increasingly recognise that real happiness and peace of mind cannot be achieved by betrayal or compromise of these values. A key step in many forms of psychotherapy and business consultation today is the elicitation of values, whether personal or corporate, and devising ways of living and acting in accord with them. Throughout the course of history, until a generation or so ago, people tended to accept their station in life and only a privileged elite could live entirely as they wished. Now ever more people feel that they have a particular talent or purpose to realise. In some this manifests as an unrealistic sense of entitlement, but in the better adjusted and more mature this comes as an urge to contribute, to help others and the

world, and thereby give their lives meaning and facilitate their realisation of their full potential.

This again has profound consequences for architecture and urban design, and the pursuit of sustainability. Ask probing questions of people about how ideally they believe we should live: What should be our relationship with neighbours and community? How should we travel to work and get our children to school (driving the latter every day, or walking along leafy, safe routes, say)? What should we eat and how should it be produced and sold? The more you probe, the more evident it becomes that people are often not living in accord with their values, and moreover that would be impossible in the contemporary city. How, for instance, might we achieve and combine no commuting, growing our own vegetables, recycling all waste locally, living in a diverse and mutually supportive community, and letting children run wild in safety while also bringing them up to be familiar with how we make our living?

The impossibility of living in accord with our deep values and beliefs leads to an underlying, usually unacknowledged, malaise, from which we distract ourselves through excessive consumption and other forms of essentially addictive behaviour. All this has to be addressed in designing for sustainability. To radically revise our lifestyles, we must radically revise our human settlements, at the levels of the layout and functional mix of urban areas, as well as of the organisation and functional mix of individual buildings. We certainly cannot keep devouring the countryside with a sprawl of housing estates, which are wasteful in land and the time and energy spent commuting, nor constructing soulless urban areas conceived as mere aggregations of individual buildings rather than contiguous social fabric.

Other manifestations of changes in values are the many dimensions of the return of the feminine (after millennia of a dominating patriarchy), the rejection of racism and the advocacy of multiculturalism. Although these are forces for change, for moving beyond modernity, they are also consequences of it and postmodernity, some of their final and finest gifts.

Assessing the scale of the change

In many periods of past and recent history, people were convinced that they were on the threshold of profound epochal change. This was certainly true of the 1960s, but also of other periods before and, for some people, since. Yet the case then for people thinking themselves on such a brink was far less compelling than it is now, particularly because of the huge and accumulating impacts of the computer. The relevant questions seem to be less about whether we are undergoing epochal change, than in how major this change will be. And which epoch is drawing to a close? Or should that be epochs? And what will be the characteristics of the new era?

That the age of heavily oil-dependent modern architecture will soon be over appears obvious. It seems similarly certain that while we will continue to use and preserve the infrastructure from the Second Industrial Revolution (which roughly correlates with the period now known as Modernism) and aspects of it will continue, making the transition to the Third Industrial Revolution will bring huge benefits and perhaps our best chance of collective survival. That modernity, the longer 400- to 500-year-old epoch, is passing also seems relatively uncontroversial. But with that and the quest for sustainability, are we not also seeing the end of the quest, which was already underway with the founding of the first cities some 8,000 years ago, to conquer nature? Now, instead of subduing it we must seek to live in symbiosis with nature, not least by applying the ecological understandings bequeathed by modernity.

Will we then reverse our progressively acquired sense of separateness – from nature and cosmos, from other people and community – a prime characteristic of Western consciousness that contemporary science considers fallacious? This seems to have started with the first Mesopotamian cities, partly as the consequence of the invention of scripts and linear, left-brained modes of thinking these induced (which repressed the feminine); and in Europe it began as warrior nomads swept in from the steppes to displace the worship of a fertile Mother Earth with vengeful sky gods. This sense of separation gained impetus as Greek philosophers stressed reason and dualism, to be intensified again through the rediscovery of reason in the Renaissance, the dualism of Descartes and the ideas of the Enlightenment. For decades now, theories and discoveries in science have been telling us this sense of separateness is a delusion, as is the sense of reality that goes with it. This will eventually sink in, though many wonder why it is taking so long, so closing another long phase in our development.

Probably all these phases of differing longevity in human, or at least Western, history are coming to an end more or less simultaneously. This powerfully highlights how momentous the transition is we are undergoing. But to focus our explorations in the most manageable and fruitful way, next month we will discuss the transitions from pre-modernity to modernity, and then to postmodernity and how these were and are reflected in architecture – that is momentous and revealing enough.

Although hers is not the framework we will be drawing on, let's close with a table adapted from Charlene Spretnak's brilliant book *The Resurgence of the Real*. Here she contrasts three paradigms – or as she prefers, 'cultural ecologies' – Modernity, Deconstructionist Postmodernism (the transitory, hyper-relativist mode of thought usually referred to as Postmodernism) and Ecological Postmodernism, which she implies is the emerging long-term successor to modernity. Her vision of Ecological Postmodernism is consistent with new and emerging understandings from science and incorporates new visions of what it means to be fully human. Based on a living and unfolding cosmos, its understanding of reality is more dynamic, relational, complete and complex than that of modernity, strongly contrasting with both the 'objective', fixed order of modern reality and the arbitrary social construction of that of Deconstructionist Postmodernism. The table may not be exactly self-explanatory, especially without the supporting argument of the book, but even by itself is richly suggestive and worthy of contemplation in preparation for next month's explorations.

6. Analysis of three 'cultural ecologies' adapted from *The Resurgence of the Real* by American academic and activist Charlene Spretnak. Consistent with new and emerging understandings from science, a vision of Ecological Postmodernism conceives reality as more dynamic, relational and complex, in contrast with the fixed order of modern reality and the arbitary social construction of Deconstructionist Postmodernism

We invite readers to join the debate. Send your comments and observations on the AR's Big Rethink to areditorial@emap.com

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	Modern	Deconstructionist Postmodern	Ecological Postmodern
Meta-narrative	*Salvation and progress*	*None (They're all power plays)*	*The cosmological unfolding*
Truth mode	*Objectivism*	*Extreme*	*Experientialism*
World	*A collection of objects*	*An aggregate of fragments*	*A community of subjects*
Reality	*Fixed order*	*Social construction*	*Fragmented*
Sense of self	*Socially engineered*	*Fragmented*	*Processual*
Primary truth	*The universal*	*The particular*	*The particular-in-context*
Grounding	*Mechanistic universe*	*None (total groundlessness)*	*Cosmological processes*
Nature	*Nature as opponent*	*Nature as wronged object*	*Nature as subject*
Body	*Control over the body*	*'Erasure of the body' (It's all social construction)*	*Trust in the body*
Science	*Reductionist*	*It's only a narrative!*	*Complexity*
Economics	*Corporate*	*Post-capitalist*	*Community-based*
Political focus	*Nation-state*	*The local*	*A Community of communities of communities*
Sense of the divine	*God the Father*	*'Gesturing towards the sublime'*	*Creativity in the cosmos, ultimate mystery*
Key metaphors	*Mechanics and law*	*Economics ('libidinal economy') and signs/coding*	*Ecology*

REVIEWS

Defying definition

LUIGI PRESTINENZA PUGLISI

RE-CYCLE – Strategies for Architecture, the City and the Planet, MAXXI Museum, Rome, until 29 April

The MAXXI Museum in Rome has a tormented history. Zaha Hadid's magnum opus took 12 years to complete, had one of its wings chopped off and ended up costing around €150 million. This works out at between €7,500 and €10,000 per square metre; an outrageous amount by normal Italian standards. (MACRO, Rome's other new modern art museum designed by Odile Decq, cost approximately €3,000 per square metre.) But such sacrifices were considered acceptable because an Italy corrupted by veneration of the past and historicist nostalgia could finally boast a new museum dedicated to contemporary culture.

Yet this proved to be the beginning of an increasingly embarrassing situation for critics of MAXXI's architectural exhibitions. Following its opening in 2010, it has staged shows dedicated to Luigi Moretti, Pier Luigi Nervi and Gerrit Rietveld, but these could just as easily have been hosted by the city's Galleria Nazionale d'Arte Moderna, the national museum dedicated to the 20th century. Rendering the situation even more depressing is the fact that these shows were not even produced by the MAXXI, but by others: so-called *'ricicloni'* ('recycloned' exhibitions: a play on 'recycled' and 'clones').

RE-CYCLE, at MAXXI until 29 April is, then, paradoxically, the first major architectural exhibition not to have been recycled. In other words, it is the first to be conceived and produced in-house by the museum's curators, and thus the first to offer a critical statement on the condition of contemporary architecture.

Above: A swarm of common items discarded in the Georg-Büchner-Anlage Park in Berlin are transformed into a public gathering space by German design agency, raumlaborberlin. At once both a recycled object and a tribute to the act of recycling the project is one of many examples featured in the MAXXI's recent exhibition

Responding to the times and Italic prudence (which counsels not to aggrandise one particular person or philosophy), MAXXI's curators rejected international starchitects or national practitioners in favour of a politically correct theme. Who could possibly object to the need for a more sustainable world?

Offering a disparate collection of projects, drawings and buildings, the exhibition is thoughtfully designed. There are also two site-specific installations. One, a protruding and hairy portal in wood and synthetic raffia indicating the museum entrance, is by the Brazilian Campana brothers, rising stars of fashionably Arte Povera design. The other by the German group raumlaborberlin is a shack constructed from recycled materials.

However, in analytical terms, the exhibition is less than convincing. The term 'recycle' is vaguely and confusingly employed to indicate five different activities: re-programming, land reclamation projects, the reuse of buildings, inverting the meaning of an object and the recovery of materials.

Re-programming occurs when a product intended for one use is transformed to accept a radically different one – for example, the idea of shipping containers as shopping centres, proposed in Beijing by LOT-EK. Yet with the exception of a few examples, the results are bizarre, kitsch and aesthetically depressing.

Land reclamation is another potentially intriguing conceptual thread, as demonstrated by James Corner on Staten Island, where nature is used to recover a former waste dump. However, it is difficult to see this as recycling in the strictest sense of the term. Even more singular is the third definition, the reuse of buildings. Describing it as an act of recycling is a bit far-fetched, and by this measure, Italy is the most virtuous of nations, where nothing is demolished (not even when constructed illegally) and everything is transformed. And if it is only possible to discuss recycling within the context of employing raw or basic materials, the confusion only increases. For example, it is misleading to present the work of Lacaton & Vassal at the

Palais de Tokyo in Paris, because beyond conveniently chiming with the theme of recycling, it explores a different and more challenging idea, the aesthetic of the unfinished and the temporary.

The fourth definition deals with the world of art. Yet if in a certain sense Duchamp's moustachioed Mona Lisa is a work of recycling, it cannot be seriously proposed in an exhibition with the subtitle 'Strategies for Architecture, the City and the Planet'. Finally, the fifth definition: the reuse of materials and primary resources. Disappointingly, little is shown. Standouts include buildings realised from leftover material after an earthquake in China for the Rebirth Brick Project by Jiakun Architects, but more examples would have amplified and enriched the theme.

The sense is that curator Pippo Ciorra focused on aestheticising the exhibition, rather than confronting the problem of the lifecycle of materials based on rational criteria. The show appears to be just the latest victim of an Italian obsession: conserving everything without throwing anything away.

Nature in architecture

RICHARD WESTON

Biomimicry in Architecture,
Michael Pawlyn,
RIBA Publishing, £25

It is said that more money worldwide is now devoted to biomimicry than to any other field of research, and while the term may not yet be on everyone's lips its headline stories are familiar – moths with 'stealth bomber' features to help them evade predators or glass-climbing robots modelled on geckos' feet. Biomimicry promises to be game-changing in fields from materials science to medicine and for Michael Pawlyn it is also the key to addressing the major architectural challenges of the 21st century: radical improvements in the efficient use of resources, shifting from a fossil-fuel to a solar economy, and changing from linear to closed-loop systems for stewarding the flows of energy and materials.

Below: Detail of a lily pad showing its leaf structure. In biomicry, architecture takes inspiration from the examination of models, systems, elements and processes of nature, which can inform major architectural challenges of the 21st century

The best known applications of biomimetics in architecture, such as passive-cooling systems allegedly inspired by termite mounds, are environmental and have little to do with that more ubiquitous manifestation of the revival of interest in 'natural design' – computer-generated biomorphic forms emulating nature's appearance rather than her underlying logic. Pawlyn, happily, is dismissive of most things blob-like: he is interested in what the scientist Julian Vincent calls 'the abstraction of good design from nature' and his book offers an admirably clear account of how such thinking can be applied to buildings and settlements.

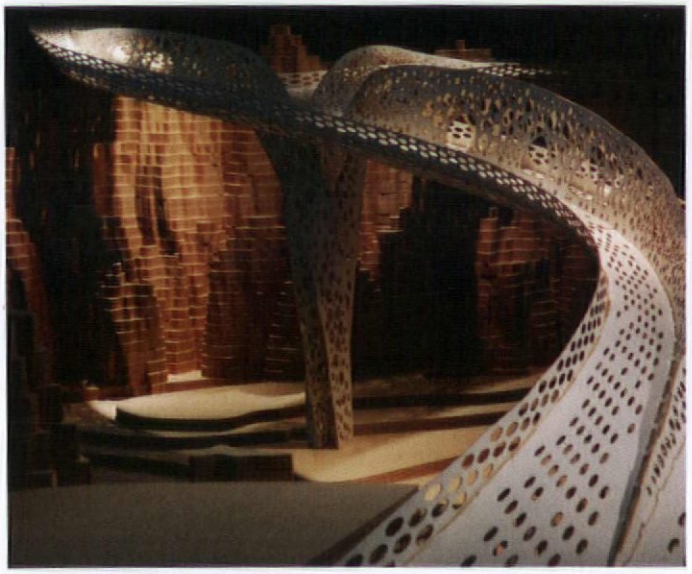
Although Pawlyn's concerns are global in scope, much of the delight of his book lies in the design principles illustrated by numerous, often near-miraculous examples he marshals as potential models. Some were grist to the mill of the last wave of nature-inspired thinking in architecture – illustrations of nature's ability to economise on materials by exploiting shape, for example, were celebrated in Gyorgy Kepes's 'Vision + Value' series of books in the 1960s – but many are new and striking.

The abalone shell, we learn, is formed from stiff platelets of aragonite (a form of calcium carbonate) held together by a flexible polymer mortar, producing a material that is more resistant to fracture than would have been produced by a stronger 'glue'. Like bricks bonded with lime mortar, this combination is the almost universal practice in nature, and in striking contrast to many man-made assemblies. Or consider the Namibian fog-basking beetle that climbs to the top of a sand-dune at night, radiates body-heat to the night sky to cool its matt-black surface below the ambient temperature and then drinks the water that condenses overnight, courtesy of water-attracting bumps that create spherical droplets which run easily to its mouth – a process analogous to the way the Persians once made ice in the desert using black ceramic trays.

Similar examples pervade the literature of popular science. However, what makes Pawlyn's arguments so pertinent is topicality, as the need to think differently is becoming everywhere apparent. Technological developments are now enabling us to engineer structures, materials and systems in ways that emulate these natural models. The strength of spider's silk (which is better than Kevlar, the strongest man-made fibre) is well known, but now the means to build and spin similar polymer chains may not be far off. Also pertinent is the growing range of architectural projects that deploy biomimetic thinking.

Several of these come from his own portfolio, first with Grimshaw, and now with his own firm Exploration Architecture, and most concern passive energy design. Others, however, such as the carpet-makers Interface, are more unexpected. The firm's late chairman became fascinated with biomimetics when a workshop entitled 'How Would Nature Make a Carpet?' yielded a hugely successful design based on the randomness that pervades natural surfaces. Gecko-inspired ways of eliminating adhesives, re-engineered carpets that need half the material to achieve the same durability, and a host of other nature-based innovations followed.

History teaches us to be wary of technologically-inspired predictions that concern the future of architecture. A century and a half



after Eugène Viollet-le-Duc suggested that within 20 years most buildings would be made in factories, on-site construction remains the norm, and in his enthusiasm for biomimicry I suspect Pawlyn overestimates how quickly these ideas will transform everyday building in temperate climates. But his enthusiasm is contagious and despite a somewhat steep price his book can be enthusiastically recommended as a stimulating introduction to ways of thinking that could radically change how we build.

The Greens under scrutiny

AUSTIN WILLIAMS

Green Philosophy: How to Think Seriously about the Planet, Roger Scruton, Atlantic Books, £22

Last year, the British Green Party MP Caroline Lucas launched the 'Home Front' initiative, which used the language of the Second World War to hark back to the joys of a war economy. In this rose-tinted world-view of global conflict, '31,000 tonnes of kitchen waste were being saved every week [and] the nation's health improved as diets changed and people become more active.' The point of the exercise was to show that austerity can lead to resourceful and environmentally-friendly communities.

In the current recession where many consumers are being priced out of what the Greens call 'over-consumption', where car drivers are thinking twice about filling up, where industrial collapse means lower emissions and where fewer people can afford to fly, you would have thought that the Greens would have been cock-a-hoop with the environmental benefits of the current economic malaise. In fact, environmentalism is in the doldrums.

Greens celebrate the Big Society potential that austerity brings, but they cannot fathom why the much-vaunted British spirit of war-time camaraderie has failed to materialise. This book acknowledges there is surely no greater adversity confronting us than the possible ecological destruction of the planet.

This presents society with a huge opportunity to generate community-spiritedness, which, in turn, may lead to the ability to tackle those very environmental problems. Professor Roger Scruton (who buys into the environmental mantras of less growth and more constraints) has written over 400 pages examining why it isn't working.

Some can only suggest that the public's flagrant rejection of restraint – their wilful desire for consumer products and non-renewable energy – is testament to the fact that the green message isn't getting across effectively. However, this seems like a weak excuse given that environmentalism has become something of an orthodoxy. Maybe, argues Scruton in this highly readable book, it's not only the messenger who is to blame, but also the message.

Scruton, author of the brilliant *Beauty*, is one of the few philosopher intellectuals in the world today. Here he argues for personal responsibility in the fight to save the environment, suggesting that liberal and statist interventions undermine our capacity to act. He deals with a number of issues, but begins by condemning green catastrophism; the tendency to overstate risks. Predominantly, building communities on the basis of adversity is never as meaningful as creating real communities of ambition and in any case 'the risk-free life is not a life in which we are or can be fulfilled'. On this, as on many issues such as the vilification of climate change 'deniers', he raises important issues about liberty, reason and justice. 'Science does not end our disagreements,' he says, 'even when they appear to be disagreements about the facts.'

Scruton criticises many environmentalists for setting what he believes to be impossibly high goals. Rather than 'saving the planet', Scruton prefers to advocate getting involved in more 'modest proposals'. By appealing to small-scale initiatives, he believes we can relate more naturally to our *local* environment than to *global* concerns. He describes this parochial motive as 'the love and feeling for home' (*oikophilia*) and it is this defence of the 'shared love of a shared place' (*Heimat*) that forms his big unifying idea.

Scruton's principal mechanism to achieve this 'spiritual resource' is to reclaim environmentalism as a conservative agenda as distinct from a socialist enterprise. For him, Alarmists and Globalists who demand top-down intervention exemplify old-style state socialism. And, he adds, in case we didn't get it, 'the centrally planned economy was an environmental disaster'.

While his nuanced criticisms of the growth of bureaucratisation and risk aversion, and the collapse of subjectivity are accurate, he seems blissfully unaware of his own alarmism – of a Reds-under-the-beds kind – to mobilise his arguments. His pro-modernist, universalist, Marxist straw man, for example, is invented as a means of rallying his conservative troops in defence of decent environmentalists everywhere. Declaring an interest as someone who subscribes to the progressive, modernist tradition, I cannot see many of us in evidence; and certainly not within the environmentalist lobby.

Environmentalists may be outraged to be compared to Scruton's hunting, fishing and badger-culling proto-nationalism, but the reasoning is just. For him, conservativism reflects the 'politics of delay, the purpose of which is to maintain in being, for as long as possible, the life and health of a social organism'. A shorthand for sustainable development surely; but also, in Scruton's hands, defending the 'social organism' also means defending the 'social order.'

Scruton is not interested in politics – where polarised arguments may lead to societal rifts – he is more interested in a harmonious, consensual, moral order that can limp ever onwards. While many eco-socialists may baulk at the explicit reactionary logic of their beliefs, ermine-clad radicals like Lord Melchett, Jonathon Porritt,

Above: *Biomimicry in Architecture* – model of the Shell Lace Structure of the Shi Ling (Stone Forest) pedestrian bridge in Yunnan, China. The hypothetical scheme by architects Tonkin Liu with Ed Clark of Arup was inspired by the ingenuity of seashells, creating a stunning structure using minimal materials

Sir Crispin Tickell, Zac Goldsmith, Prince Charles et al, can be wheeled out as Exhibit A, m'lud.

'The real evil against which both sides should be united,' says Scruton, 'is the habit of treating the Earth as a thing to be used but not revered.' For the unelected protectors of the environment, reverence is key to being 'maintained in being for as long as possible'. However, Scruton's exhortations for a renewed 'love of country' and his defence of 'tradition' comes across as somewhat self-conscious. Unlike 19th-century toffs, he is unsure of his ability to carry it off and reverts to the language of cultural studies, well-being, biological determinism, happiness and identity politics. Indeed, his advocacy of consensus is in danger of wallowing in intellectual relativism. For those who admire Scruton as the tweed-wearing scourge of postmodernity, this must surely represent a collapse rather than renewal of conservatism.

It should be hardly surprising that Scruton uses moral exhortation as opposed to political engagement. As someone once remarked: 'The philosophers have only interpreted the world, in various ways; the point is to change it.' In truth, Scruton doesn't really want to change it.

Lateral thinking

PETER BUCHANAN

The Third Industrial Revolution: How Lateral Power is Transforming Energy, the Economy and the World, Jeremy Rifkin, Palgrave Macmillan, £16.99

This is not the sort of book normally reviewed in architectural magazines. But it is too important, and its implications for architecture and environmental planning far too great, to ignore. Any architectural practice wanting a better grasp on what the future might hold, and how to position itself to participate in bringing about that future, would do well to require a staff member to read and report on the book.

This is only the latest of a series of influential, often seminal, books by Rifkin, an economist, political advisor and prolific author. The primary focus of these activities is on the implications of scientific and technical change on the economy, society and the environment: he has long been concerned with climate change and renewable energy. As well as advising the EU on embracing the Third Industrial Revolution – which it is committed to, if now distracted by the Euro crisis – he and his colleagues have produced masterplans for San Antonio, Texas, and Rome so that these cities may do the same to make the transition into the post-carbon future.

In Rifkin's terms an industrial revolution is brought about by the confluence of a new energy source and new mode of communication, these being analogous to the bloodstream and nervous system of the body. It is the synergies between these and the impacts of the infrastructural systems they depend on, as well as the modes of financing these, that determine much of the character of each revolution.

The First Industrial Revolution was brought about by coal-fired steam that powered railways and ships as well as the rotary presses of the mass-printed communications media of the day – newspapers, posters and pamphlets, and books. With the Second Industrial Revolution, the new form of energy was oil that still powers the internal combustion engine of cars and trucks, as well as ships and planes. Oil, along with coal and some nuclear power, also fuels the power stations providing the electricity for the new modes of communication: radio, cinema and television as well as the telephone and fax.

Both these industrial revolutions depended on massive investment to extract the energy (in coal mines and oil wells, refineries and so on), build the corresponding infrastructure (the rail networks and then those of motorways, as well as power stations and distribution grids) and for the machinery that filled their foundries and factories. Financing all this led to the centralisation of power in a few mega-rich owners and huge, often near monopolistic, corporations – generously aided and subsidised in various ways by government and taxpayer. In turn this led to top-down, pyramidal command and managerial structures, the reduction of much work to repetitive drudge and to gross inequalities in status and rewards.

With the Third Industrial Revolution (TIR), energy comes from the widely distributed sources of renewable energy, with every building a micro power station, and the communications medium is the internet. These will both be served by the same smart grid that distributes through its dispersed networks flows of energy and information, the latter adjusting the flows of the former according to demand and where it is currently being produced. This latter factor is important because the supply from renewables is erratically intermittent, so requiring networks to distribute it from wherever there is an excess beyond demand. Also required, for the same reason, is an efficient form of storage, and Rifkin has long been an advocate of hydrogen fuel-cell technology for this and transport.

Below: Diagrammatic network plan of Adrian Smith + Gordon Gill Architecture's project, Chicago Loop Decarbonization, which features in Jeremy Rifkin's masterplan for Rome. Rifkin proposes a systematic, dynamic approach to retrofitting cities for the new industrial economy that maximises both ecological and economic efficiency

Thus to implement TIR, what Rifkin refers to as its Five Pillars need to be in place: (1) the shift to renewable energy; (2) transforming buildings into micro power plants; (3) deploying hydrogen and other energy storage technologies in every building and throughout the infrastructure networks; (4) using internet technology to transform the power grip into a smart 'intergrid' in which millions of buildings can share energy; and (5) transitioning transport to electric plug-in and fuel-cell vehicles that can buy and sell electricity throughout this grid.

This is a pragmatic proposal of great promise, with broad and profound consequences. In contrast to the vertical top-down power structures of the two earlier industrial revolutions, TIR is leading to collaboration rather than competition – what Rifkin calls lateral power. This will bring a partial shift from markets to networks in which: 'The adversarial relationship between sellers and buyers is replaced by a collaborative relationship between suppliers and users. Self-interest is subsumed by shared interest. Proprietary information is eclipsed by a new emphasis on openness and collective trust. The new focus on transparency over secrecy is based on the premise that adding value to the network doesn't depreciate one's own stock but, rather, appreciates everyone's holdings as equal nodes in a common endeavour.'

Little wonder the corporate behemoths of the second revolution are doing all they can through lobbying and other forms of political influence to stall TIR. And recognising that some renewables are inevitable they try and hijack

them by advocating massive centralised modes of collecting renewables (huge wind farms and solar arrays – which certainly must play some role) rather than small-scale distributed collection. In part, the current economic meltdown is due to the delay in transitioning to TIR and the deregulation rather than overdue reform of these behemoths.

As cogently argued by Rifkin, TIR will bring much more than economic and ecological survival, and very different ways of doing business. Because we will now be harvesting and living in harmony with nature's cycles and capacities, it will bring what he calls 'biosphere consciousness'. In turn this will bring a leap in the quality of life as it 'changes our sense of relationship to and responsibility for our fellow human beings. We come to see our common lot. Sharing the renewable energies of the Earth in collaborative commons that span entire continents can't help but create a new sense of species identity. This dawning sense of interconnectivity and biosphere embeddedness is already giving birth to a new dream of quality of life ... We come to realize that true freedom is not found in being unbeholden to others and an island to oneself but, rather, in deep participation with others. If freedom is the optimization of one's life, it is measured in the richness and diversity of one's experiences and the strength of one's social bonds. A more solitary existence is a life less lived.'

Also: 'The shift ... from elite fossil fuels to distributed renewable energies will redefine ... international relations more along the lines of ecological thinking. Because the renewable energies ... are ample, found everywhere and easily shared, but require collective stewardship of the Earth's ecosystems, there is less likelihood of hostility and war over access, and greater likelihood of global cooperation.'

As the quotes indicate, the broader consequences of TIR are beautifully expressed in the book and, more important, inspiring – so (it is to be hoped) hastening the transition to it, despite the resistance from corporations, banks and the politicians they influence. For instance, there is a good chapter on rethinking economics, whose laws it is argued are disastrously modelled on Newton's laws of motion rather than the far more relevant laws of thermodynamics, and an inspiring one on the necessary changes to education that is pertinent to how we might learn architecture.

All in all, it is an optimistic vision that in no way denies the messages of the doom mongers but instead outlines a very promising and convincing way forward.

Below: Vitruvian Man by Leonardo Da Vinci. The ideal human proportions depicted by Vitruvius, who believed the human figure represented the principal source of proportion among the Classical orders of architecture, were slightly modified by Da Vinci

Leonardo's Vitruvian man

JOSEPH RYKWERT

Da Vinci's Ghost, The Untold Story of the World's Most Famous Drawing, Toby Lester, Profile Books, £16.99

The catchpenny title is misleading: there are no Templars in this book, no conspiracies, and only one execution. The drawing – dimly reproduced on the cover – is Leonardo's famous (yes, arguably 'most famous') one, that of a naked man in both a square and a circle. As it is very delicate, it is kept locked up (and rarely shown) in the Accademia Gallery in Venice, but has been interminably emulated, caricatured, mangled and – as often – just reproduced. You may remember a version of it plastered all around London to advertise an employment agency called Manpower (who seem to have abandoned the logo when they went on-line), and you may well have handled it on the obverse of the troubled one-euro coin.

Its history has often been told: Leonardo bequeathed it (with many others) to his disciple Francesco Melzi, whose heirs then sold it on to Cardinal Cesare Monti, and his heirs in turn to the painter-connoisseur, Giuseppe Bossi. Bossi published a study of it, with some other Leonardo anatomical drawings, all of which he engraved in 1811; and subsequent to his death in 1815 the drawing was bought by the Accademia in Venice.

What it is 'about' is also quite clear from Leonardo's notes which were written in his usual mirror-writing above and below the image. 'Vitruvius the architect,' he begins, 'says that the measurements of the human body are distributed by nature as follows ... and these measurements he used in his buildings.' This passage from Book III is one of the most commonly illustrated in the many editions of his treatise. Leonardo makes all sorts of variants on the ancient formula; moreover, while Vitruvius has his square man standing and the circular one lying supine (so you could draw a circle centred on his navel), Leonardo has them both standing in the one figure; and while Vitruvius' man is famously six-foot high, Leonardo's has a more delicate foot which goes seven times into his height.

Now Leonardo was well-known to be graceful and good looking, and a small foot was a mark of elegance. The man who looks you straight in the eye from the drawing may well be Leonardo himself, and these details and proportions have been studied by any number of scholars; moreover the Accademia sheet is related to the manuscript on the geometry of Human Movement, of which various fragmentary copies exist.

One copy known as the *Codex Huygens* is the most complete and famous, and though now in the Pierpont Morgan Library in New York, it was certainly in this country in the 17th and 18th centuries; some drawings related to it were engraved by Edward Cooper, probably the same Cooper who restored and mounted the *Codex* sheets for Constantine Huygens. He certainly thought they were by Leonardo.

So that part of the story has been told, often and in detail. What does give substance to Lester's claim that he has a new story to tell is his incorporation of recent research: such as the Canadian scholar Indra McEwen's suggestion that the statue of Augustus in armour found at Prima Porta in Rome makes the Emperor's body a summation – and image – of his empire, and that of the Italian architect-historian Claudio Sgarbi's identification of a wrongly-bound miscellany in Ferrara as the first ever illustrated Vitruvius. Inevitably, it has a man in the square in Book III as well, which does bear a relation to the Accademia drawing.

The Ferrara Vitruvius, generally considered to have been written in about 1490–1500, is now tentatively attributed to Giacomo Andrea, Leonardo's friend and drinking companion, whom the French commander had executed and quartered after the conquest of Milan for his loyalty to the deposed Duke, Lodovico Sforza. This is the execution I mentioned earlier.

What Lester sets out to show, however, is the way in which Leonardo – like Vitruvius before

him, for that matter – instances his belief in the near-universal doctrine that man is an abbreviation of the world, *mikro kosmos*, tiny order, while the whole universe, *makro kosmos* is a great order, as Aristotle put in his *Physics*. The idea was a reference for many thinkers through antiquity and the Middle Ages: one such was Hildegard von Bingen, who set it out in her *Book of Divine Works*. Lester reproduces a magnificent illustration of the idea from a manuscript of her text, done in about 1200. Hildegard was finally canonised in 1940, and her writings are published as part of the patrimony of the Latin church, while her songs, now translated into modern notation, have been recorded on several CDs. Hardly an 'untold' – or even forgotten – story, then. Apart from Hildegard, Lester does not seem very interested in medieval thinking – or building, for that matter.

The report of Sgarbi's recent research is one of Lester's main claims to be telling an 'untold' story; Sgarbi first suggested that the Ferrara manuscript could be by several hands, one of which may be Giacomo Andrea's, and that the key connection could be the 'man in the square'. In the Ferrara manuscript and in Leonardo's drawing, the face is one tenth the height of the figure, equal to the distance between the setting of the penis (which is the centre of the square) and the navel, which in turn is the centre of the circumscribed circle. Since the square and circle figures are not usually so associated, this really seems a telling detail.

So there is 'an untold story' in the end. Some details remain puzzling: the Venetian paper, the occasional dialect spellings in the text; Giacomo Andrea was Ferrarese and that may explain both. That a Vitruvius manuscript was connected with him we know from a stray note Leonardo makes to himself after the execution: 'Meser Vicentio Aliprando (once the exiled Duke Lodovico's secretary) who lives near the Inn of the Bear has Jacomo Andrea's Vitruvius'. Was that the Ferrara manuscript? We can only suppose and/or hope.

Toby Lester's great virtue is that he does make it all very exciting. He writes with verve and conveys the sense – from the moment in the Accademia when he is allowed to handle the Leonardo drawing wearing white cotton gloves and through all the many transformations of the microcosmic idea – that he is an enthusiastic, eager, informed guide. For any novice he can provide the essential red thread to guide him or her through the convolutions of a neglected but crucial notion which underlies a great deal (perhaps all) thinking about architecture and much else besides.

Ruskin in our time

PETER DAVEY

The Sympathy of Things: Ruskin and the Ecology of Design, Lars Spuybroek, V2 Publishing and NAi Publishers, £29.95

No one could accuse Lars Spuybroek of intellectual cowardice. In his latest book *The Sympathy of Things: Ruskin and the Ecology of Design*, he takes John Ruskin's massive oeuvre and 'places him primarily in the context of historical figures that have appeared after him. It is like a history written backwards'. In doing so, Spuybroek hopes to 'update' the Victorian sage and splice his wisdom into the web of our 21st-century computerised culture.

In this enormous and far-reaching enterprise, Ruskin meets thinkers as diverse as William James, Peter Kropotkin, Henri Bergson and DH Lawrence, and architects as different as Gottfried Semper and Frank Gehry. He has shouty conversations with Heidegger about the nature and experience of design.

His life-long hostility to the world of machines is abated in Spuybroek's imagination when Ruskin and Spuybroek, his guide through our contemporary maze, contemplate the potential of the digital world. In it, flexible machines can be made to create one-off items, so Ruskin's preoccupation with individual craftsmanship becomes superfluous.

In the great dichotomy between beauty and the sublime, the two poles of much traditional aesthetics, Spuybroek comes down firmly on the side of beauty, that concept which was so little used in 20th-century criticism, when, according to him, the sublime ruled the world. The sublime, he suggests is 'the world of forces: moving, vast and chaotic', whereas the beautiful is the world of feelings, a state to which we should all aspire as did Ruskin. 'We orient ourselves by feeling, either in space or in time ... *All relations are felt relations* and therefore relations of sympathy.' Yet, 'aesthetics is primary. For the world to work, it must rely on aesthetics. Relations cannot simply be utilitarian and functionalist, like plumbing, and physically, psychologically or mechanically direct'.

This is just a fragment of one of the hundreds of threads that make an astonishingly rich tapestry. It is unlikely that *The Sympathy of Things* will become a direct inspiration for design in the way that *The Stones of Venice* did (much to Ruskin's horror) in the 19th century. But in Spuybroek, Dutch architect and professor of architectural design at the Georgia Institute of Technology in Atlanta, Ruskin has at last found an interpreter with the breadth of learning and a poetic imagination to make his perceptions relevant to our own day. If *The Sympathy of Things* will never become a pattern book for designers' thought, every page makes you think. Wacky it may be, but it is never less than provocative.

Above: John Ruskin's study of the entrance to the south transept of Rouen Cathedral. The chalk, graphite pen and ink work was completed in 1854, the year after Ruskin published his influential essay, 'The Nature of Gothic' as part of his treatise on Venetian architecture, *The Stones of Venice*

PEDAGOGY

RMIT, Melbourne, Australia

MATTHEW BARAC

Melbourne, the cultural capital of Australia, is celebrated for its 'European' character: for its theatres and monuments, emblematic of a picturesque Victorian heritage that harks back to the days of empire. Though many who live and work here revel in this old world charm, others feel it to be out of step with how a modern city should present itself. They argue that for a major city to compete, even one as highly regarded as their own – currently the world's 'most livable city', according to *The Economist* – it must conjure up a forward-looking vision of its place in today's shifting global order.

For RMIT University (formerly known as the Royal Melbourne Institute of Technology), imagining an alternative urban future is linked to the challenge of defining its own role – as a knowledge hub for the Asia-Pacific Time Zone rather than just a national institution. Mel Dodd, director of the RMIT architecture programme, declares an interest: 'For us it is strategic... we can speculate on Australia's positioning in the geopolitical region. This is especially relevant for our graduates, who often return to work in the context of the Asian metropolis.' Nearly half of those enrolled on the programme are offshore students, drawn primarily from mainland China, Hong Kong, Singapore, Vietnam, Malaysia, Indonesia, Taiwan and Korea. Melbourne itself, home to generations of South-East Asian migrant families, has an ethnically diverse population, with Chinese being the second most commonly spoken language.

1. Axonometric drawing by student Yoon Sheng Lee of a proposal for Melbourne's Chinatown. The project analyses local infrastructure in detail, informing a scheme to reduce traffic congestion and create extra shopfronts
2. Hong Kong's street life is typical of the bottom-up urbanism often overlooked by mainstream academies but embraced by RMIT's teaching strategy
3. A photograph of housing in Hong Kong taken by student Chris Chan while mapping spatial use and circulation in the dense Yau Ma Tei district

In response to these dynamics, Dodd and colleagues Sand Helsel, Anna Johnson and Richard Black have chosen to anchor the final-year studio that they collectively teach to the topic of the Asian city. International students are attracted by the studio's engagement with diverse home cultures as well as wider urban trends. While the interminable Westernisation of cities the world over may be taken as given, a less widely acknowledged tendency is that the cities of the future – certainly those growing most rapidly – are developing along different lines. These sprawling, teeming, apparently uncontrollable cities of the 'Global South' – what we used to call the Third World – are characterised by bottom-up urbanism, micro-enterprises and ephemeral architecture.

Such urbanities are sidelined by mainstream pedagogy, which

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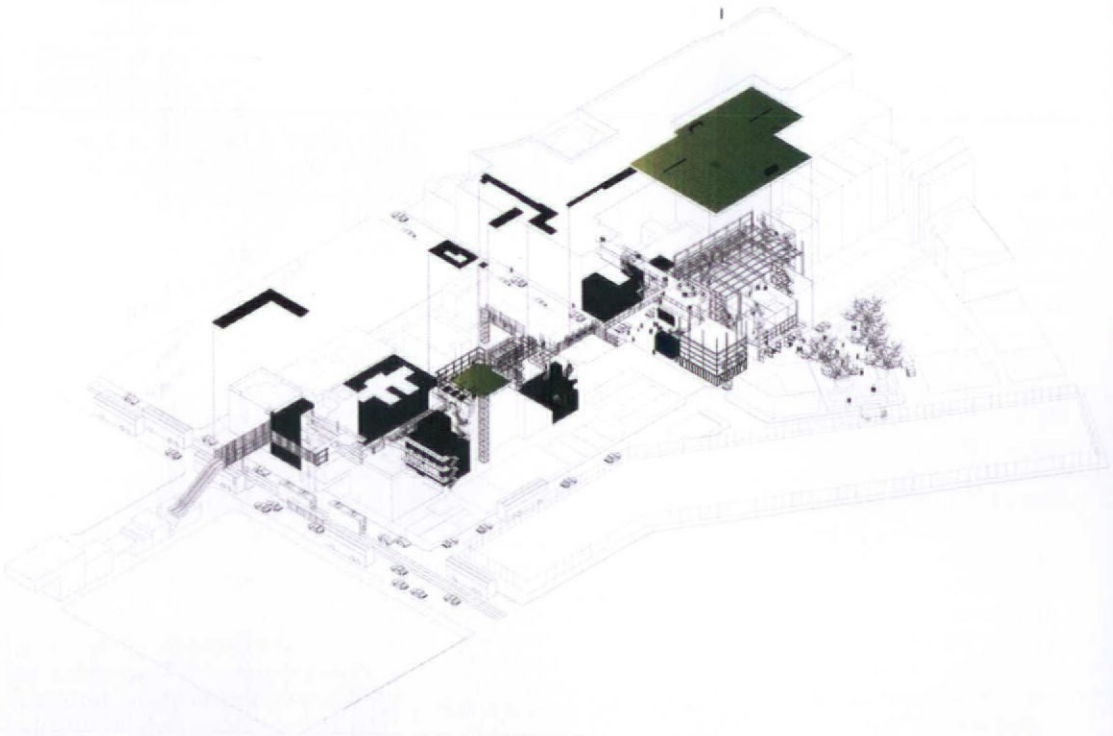

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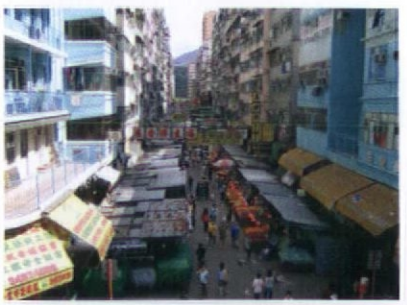

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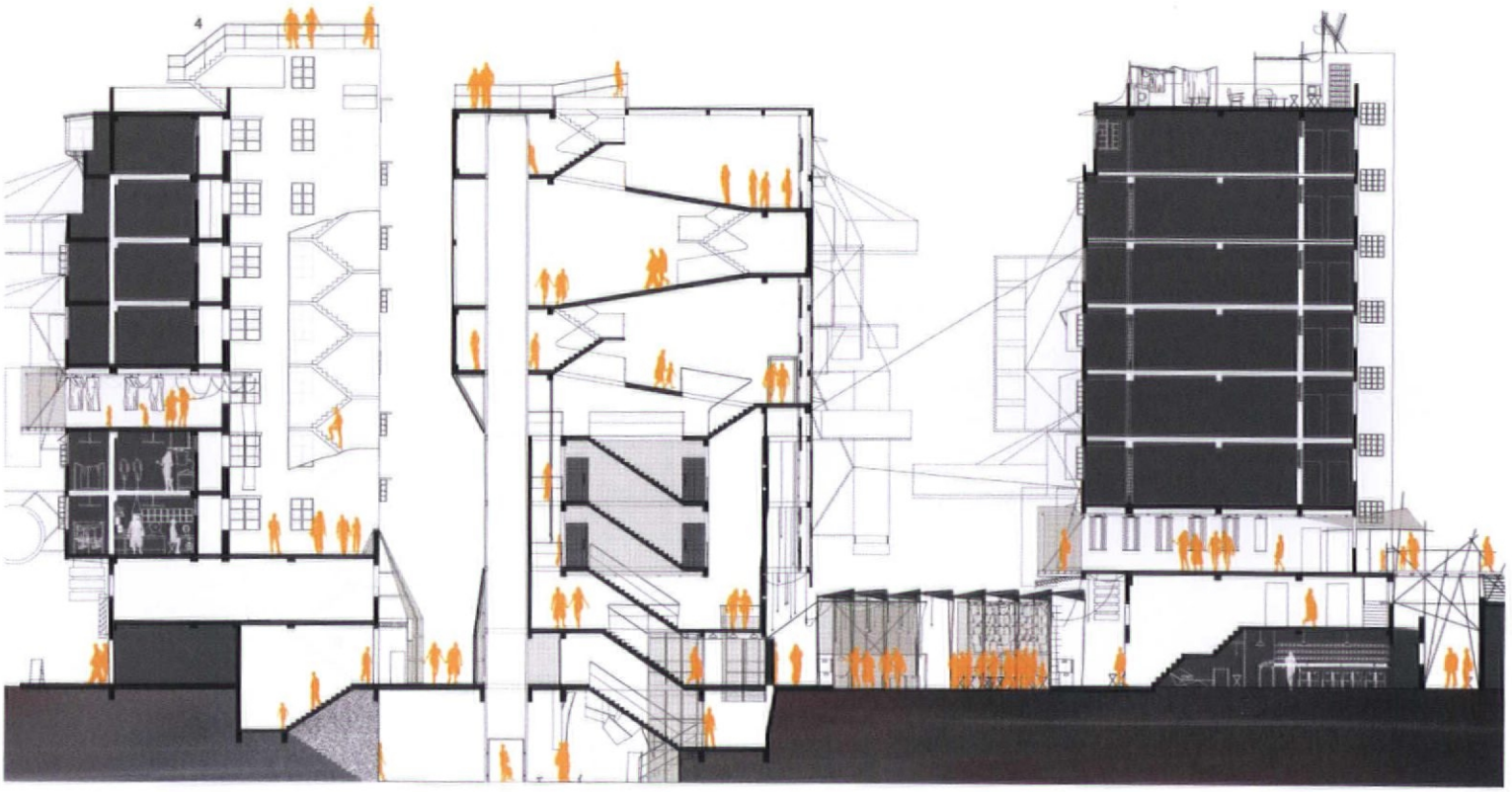
typically relies on a vocabulary of Western cities. By contrast, as Helsel argues: 'The Asian city defies conventional analysis. Our concern for an alternative model for speculation is based on an intimate connection to the material of the city.' Accordingly, the studio kicks off with a suite of exercises designed to sharpen students' interpretive skills: observing everyday life, mapping street activities, testing vernacular technologies, in preparation for a city-scale 'thesis' project. The lesson is that before attempting to make the city anew, the architect must first see it for what it really is. 'Designing in the urban context is more of a curation of existing qualities found at street level than the imposition of a formalist overlay from above,' says Helsel.

Recent graduate Chris Chan's proposal for a cultural museum in Hong Kong's dense Yau Ma Tei district takes its cue from the prevalent typology of narrow lots. While cataloguing patterns of spatial use and circulation, he noticed how the urban grain supports an intensive local street life. By breaking the bulk of his proposal into parts and redistributing them across the site, he challenged the assumption that the small-scale texture of the district precludes major public development. In a game of urban snakes and ladders, the museum fragments are reconnected through existing stairwells, rooftops, and service lanes.

Yoon Sheng Lee chose a site in Melbourne's Chinatown for a restaurant wholesale market. His mapping of the area, which entailed looking at everything from Chinese newspapers to rubbish disposal, gave him insights into foodstuff manufacture and distribution networks. It also alerted him to the havoc that impending pedestrianisation would wreak on the neighbourhood's fragile balance of conviviality and congestion. Inserting a deceptively vast warehouse into the middle of the district, he deployed 'just-in-time' technologies to ease local traffic. This strategy freed up restaurant storage facilities in the back alleyways, releasing additional frontage for small traders.

Cities everywhere are caught between globalisation's implacable atomisation of identity and localism's tendency towards parochialism. As national borders are increasingly blurred by today's economies – especially the economy of education – the transcontinental scale of the region offers a vehicle for mediating this tension. By embracing the richness of its wider Asian context, RMIT has invested in a truly cosmopolitan future for Australia.



4. Part of the long section through Chan's proposal for a new cultural museum in Hong Kong. Rather than a solitary large building, the museum is fragmented into many galleries, dispersed throughout the existing urban fabric. Chan confronts conventional assumptions about the scale of public projects that are achievable within dense urban environments

The Smithsons

STEVE PARNELL

Alison and Peter Smithson were catapulted to premature architectural stardom on winning the competition to design Hunstanton Secondary Modern School in 1950. Peter was only 26 and Alison, his new wife and former student, a mere 21 years old. Having worked in the schools division of London County Council Architects' Department for less than a year, winning the competition allowed them to set up their own practice.

Designed and built in deep austerity, Hunstanton School was a crafted building of assembled components, deliberately resisting the fashion for modular construction in favour of mimicking a Miesian aesthetic and pre-empting their 'as found' sensibility. The reason it took so long to complete was that despite its simplicity of construction and lack of finishes, the school used Norfolk County Council's entire steel allocation until the end of steel rationing in May 1953.

Hunstanton was described by one teacher who spent 37 years there as 'a tragedy'. He itemised its leaking roofs, cracking glass panels, extreme temperatures in summer and winter, horrendous sound transmission and other practical shortcomings. Even the famous wash-basin drain outlets hovering above the gulley had previously been done by Banister Fletcher at his Brentford Gillette Factory in 1936–37. But as a work of architecture, it was a rare glimmer of hope for architects wishing to reconstruct a post-war Britain in the modern idiom. It remains canonical to this day, largely thanks to Reyner Banham's definitive 1966 book *The New Brutalism: Ethic or Aesthetic?*

According to Banham, the Smithsons were, 'the bell-wethers of the young throughout the middle Fifties'. They were the architectural equivalent of the 'angry young men' of the Kitchen Sink social realism art movement, determined to break down the barriers between high and low culture and to establish themselves ahead of institutions such as the Institute of Contemporary Arts (ICA) and *The Architectural Review*. But after Hunstanton, their principal achievements consisted of rhetoric and polemic: words and images rather than buildings. These achievements were as considerable as they were enduring, however.

First, the New Brutalism invented in antagonism to the AR's New Empiricism and what the Smithsons considered the Festival of Britain's effeminate aesthetic. The Smithsons defined the New Brutalism as Banham cheered them on from the sidelines, post-rationalising Hunstanton to be its first built example in search of his *architecture autre*. So closely was this movement associated with the Smithsons that one wag even wrote to *Architectural Design*: 'Does the "New Brutalism" really mean anything other than the architecture of the Smithsons?'

Second, the introduction of a pop sensibility to architecture from the Independent Group, a vanguard faction of the ICA that included artists Richard Hamilton, Eduardo Paolozzi and critics Reyner Banham and Lawrence Alloway. This group is credited with the invention of Pop Art primarily via their fascination with (mostly American) popular culture such as adverts, comics and movies, and a willingness to not only take them seriously but to raise them to the level of art. The Smithsons' moulded plastic House of the Future prototype for the 1956 *Daily Mail* Ideal Home Show embodied these pop principles for a technologically driven age of consumerism.

Third, the replacement of CIAM with Team 10. This was by no means just a Smithson project as they were aided and abetted by an international contingent of young architects including Aldo van Eyck, John Voelcker and Giancarlo De Carlo.

'After Hunstanton, their principal achievements consisted of rhetoric and polemic'

Alison Smithson
1928–1993
Peter Smithson
1923–2003
Married
1949
Education
Newcastle School of Architecture
Key buildings
Hunstanton Secondary Modern School, Norfolk (1954)
The Economist Cluster, London (1964)
Garden Building, St Hilda's College, Oxford (1967)
Robin Hood Gardens Estate, London (1972)
Key texts
***Urban Structuring* (1967)**
***Without Rhetoric: An Architectural Aesthetic 1955–1972* (1973)**
***The Charged Void: Architecture* (2001)**
Quote
'What we are after is something more complex, and less geometric. We are more concerned with "flow" than with "measure"'

But most crucially, Alison brilliantly understood the vicissitudes of history writing and directed the process ruthlessly behind the scenes, favouring her and her husband's contributions above the others and editing out those of their dissenters. The informal nature of Team 10 meetings was documented and disseminated by Alison in a way that promoted the Smithsons' ideas not unlike the means that Le Corbusier used CIAM to promote his propaganda. Until recently, Team 10's only history existed in Alison's books, the *Team 10 Primer* (1964), *The Emergence of Team 10 out of CIAM* (1982) and *Team 10 Meetings: 1953–1984* (1991). Yet the Smithsons' preferred instrument of diffusion was Monica Pidgeon's increasingly popular *Architectural Design*.

Man-eating Pidgeon first noticed Peter in the Mediterranean at the 9th CIAM congress at Aix-en-Provence in 1953 because he was having trouble maintaining his modesty in the woollen trunks Alison had knitted for him. The Smithsons and Pidgeon thus became friends just weeks before Theo Crosby became Pidgeon's assistant at AD. Crosby was Peter's closest friend, having bumped into him while on holiday in Italy in 1948. They shared a flat in Bloomsbury while Smithson studied at the Royal Academy and Crosby worked at Fry and Drew, and when Peter and Alison married in 1949, Crosby simply moved upstairs.

When Crosby was sacked after breaking his arm in a motorbike accident, the Smithsons bought him a suit and encouraged him to apply for the advertised technical editor job at AD. Crosby got the job ahead of Joseph Rykwert, among others. From that moment on the Smithsons had almost complete freedom to publish their ideas. The relationship was symbiotic, of course: Pidgeon needed the avant-garde ideas of the Smithsons to promote her magazine against the more staid AR as much as the Smithsons needed a platform.

RAYMOND LEMSTRA

This is why the first published mention of the New Brutalism appears in AD's December 1953 issue (the first Crosby put together), the Independent Group appeared extensively in AD and the *Team 10 Primer* was an AD issue guest-edited by Alison in December 1962.

After Hunstanton, the Smithsons had to wait a decade to complete another major building, the Economist Cluster, and almost another decade again to finish their final building of any significance, the Robin Hood Gardens Estate. Banham accused the Economist Cluster of betraying the notion of an 'other' architecture, especially when portrayed as a Townscape case study with Gordon Cullen's sketches in the AR. The poorly received Robin Hood Gardens was the culmination of 20 years of thinking on housing that started with the Smithsons' 'Urban Reidentification' grid presented at CIAM 9, and formed the basis of their unsuccessful Golden Lane Housing competition entry. Ideas conceived in 1952 were, by 1972, becoming as unfashionable as the Smithsons. But these ideas did influence Peter's students at the AA, Jack Lynn and Ivor Smith, who designed Park Hill in Sheffield. Urban Reidentification is emblematic of how something that made little impact initially was promoted, published and rehearsed until it became foundational to modern architectural history.

The Smithsons' reputation, then, rests on a small number of ordinary buildings and an extensive archive of extraordinarily well-documented architectural thinking, writing and teaching. Their position in architectural history relies less upon their built work than on their considerable and influential contribution to architectural culture which is, after all, the reason they reappear, once more, here in the AR. For a couple for whom ordinariness was such an important motif, they were anything but.

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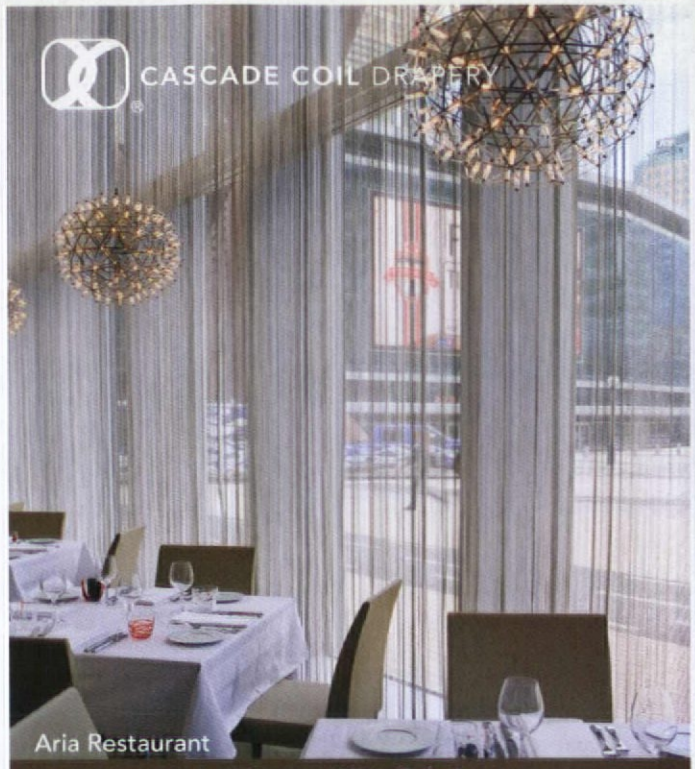

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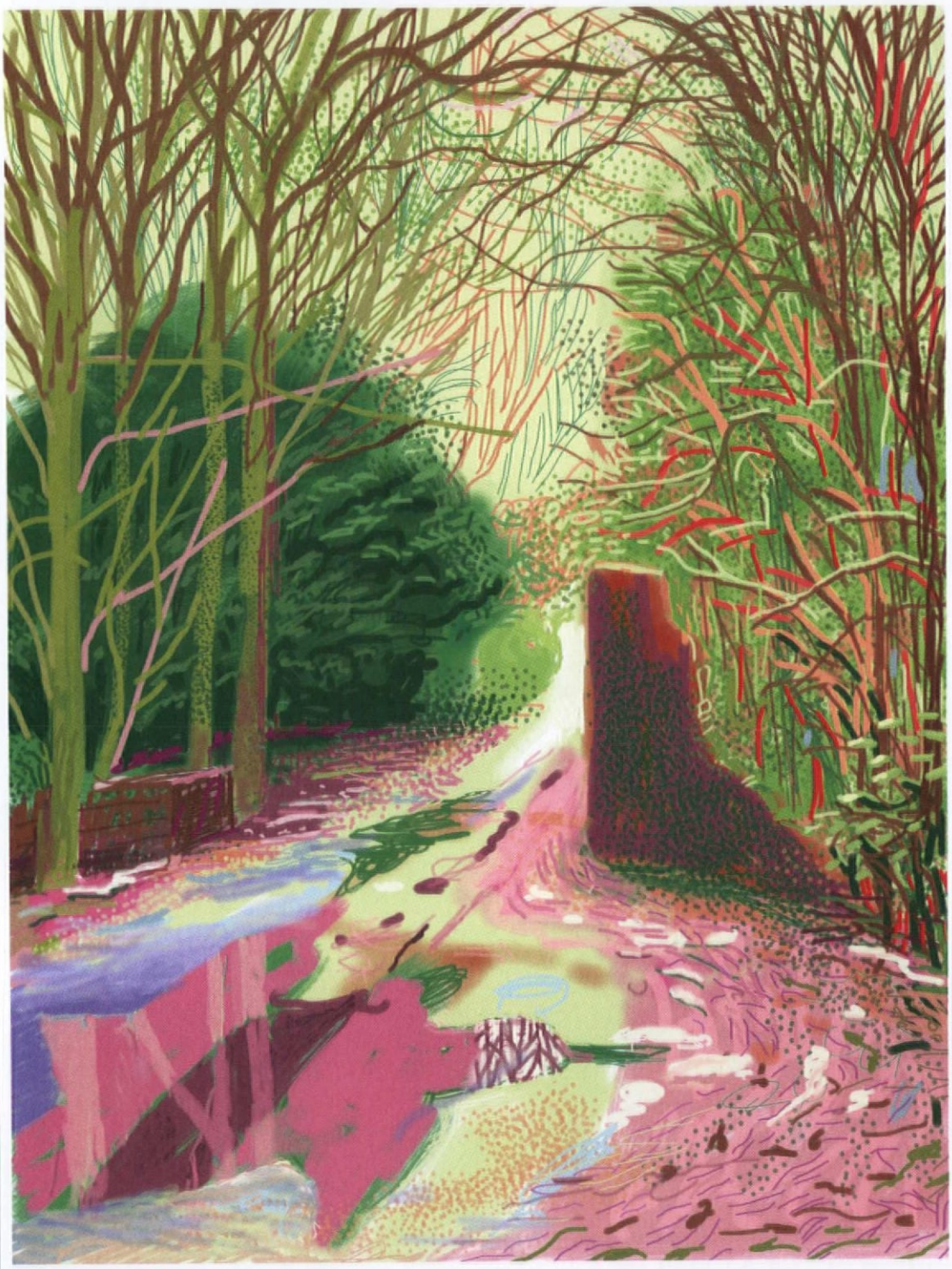

In January, the David Hockney exhibition A Bigger Picture opened at the Royal Academy of Arts in London. Rising to international acclaim for his sunny depictions of the Californian poolside in the 1960s, the septuagenarian artist has of late turned his attention to capturing the Yorkshire landscapes of his homeland.

Among one of the 150 new works on show – which vary in scale from small charcoal drawings to truly enormous painted canvases – this image is one of his experiments in using the paint tool on his iPhone or iPad. Though this isn't a traditional painterly approach, the artist boasts that all the works are from his own hand (a perceived jibe at Damien Hirst), and indeed all the pieces express the unmistakable energy and enthusiasm of their creator. This uplifting exhibition at the RA runs until 9 April, but there will be later stagings at the Bilbao Guggenheim and Museum Ludwig in Cologne.

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