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**DAYLIGHT &  
ARCHITECTURE**  
MAGAZINE BY  
VELUX

SPRING 2006 ISSUE 05 TEXTURE & LIGHT 10 EURO

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# DISCOURSE BY ARTHUR ZAJONC

Light's touch changes everything. What lay shrouded in darkness is revealed, and hidden spaces suddenly open wide under light's dance. In itself, unseen, we see by means of light's selfless activity. In physics, the refinement of light's touch is measured by its wavelength. The very smallness of visible light's internal patterned movement guarantees that the tiniest detail, the most subtle texture, remains visible. The brushed surface of metal and the filamentary strands of the spider's web would both fade into invisibility if light were larger, its wavelength longer.

Einstein alerted us to the unique role played by the speed of light, which is a universal absolute in a relative universe, an ultimate limit in a limitless cosmos. He and Max Planck discovered that, although massless, even light has its least part – the quantum or photon. And yet that quantum, like light itself, eludes our conceptual grasp, maintaining its subtle ambiguity and wholeness through all attempts to confine and define it. Over countless years, starlight travels from the most distant reaches of space and from the beginnings of time to reach our eyes. In a miracle of reciprocity, our eyes are so perfectly adapted to light that only a few light quanta are needed for sight. What to our sensibilities is the long journey of light through the cosmos lasting ten billion years, is to the photon a mere instant – such are the mysteries of relativity.

Through the mastery of fire we first brought light from the heavens to hearth and home. By the light of a candle we reflect or read, draw or pray. Its timeless lux spreads out from a small flame to brighten a chamber, but then it swiftly travels beyond us into the night sky answering the luminous call of the stars: our light meeting starlight face to face.

When our bodies are brushed by light, we warm and open ourselves like dark sanctuaries to the penetrating luminosity of sun and sky. No wonder cathedral builders knit geometry to light in service of theology; no wonder evolution has knit plants to the silent power of sunlight in the service of life. Light is the architect of the organic world, and conversely in architecture "structure is the giver of light" – so wrote Louis Kahn.

**Arthur Zajonc** is professor of physics at Amherst College, where he has taught since 1978. He has researched extensively about the experimental foundations of quantum physics and the relationship between the sciences and the humanities. His seminal book *Catching the Light*, on the history of light in human culture, was published in 1993. In 1997 and 2002, Arthur Zajonc was scientific coordinator for the Mind and Life Dialogues with the Dalai Lama. He is also a former president of the Anthroposophical Society in America.

**VELUX EDITORIAL**  
**'HANDS ON'**

Surface and form is the ultimate materialisation of texture. And texture is the tangible top layer of the substance. Our eyes guide us to understand these matters.

Since the beginning of man, we have trusted upon our ability to judge on behalf of what we see. This judgement is crucial for our survival. But sometimes what we see turns out to be different from what we expected. We experience that when we put on our hands and feel the material on our skin. Consequently, we adapt and adjust our perception and understanding of surfaces and substances.

This issue of *Daylight & Architecture* tries to scratch the notion of surface, to uncover what is behind the visible layer, searching for magic – or eventually darkness? Outside in. Inside out. "I have seen it with my own eyes" – Does it give any meaning in the future? We asked 13 highly respected persons from various fields of art and science to relate their knowledge with the concept of sur-

face and the interaction with daylight. We present their answers to try to uncover what lies BENEATH, adding new reflections to the web of life.

The façade and the roof of a house is like our skin reacting on changing weather conditions – enabling protection and providing the living conditions that are vital for our health and well-being. Without daylight there will be no life. But light is also vital for our understanding of physical surroundings – contexts as well as for our mental balance. VELUX would like to set new standards for indoor comfort and energy efficiency within the built environment, improving our living and working conditions. The VELUX Atika concept house realises this vision in a full-scale experiment that you can see and feel.

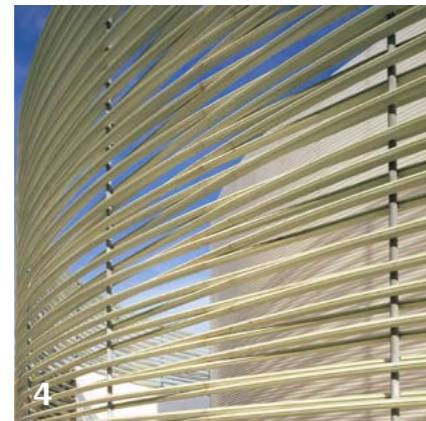
Enjoy reading issue #5.

**VELUX**

**SPRING 2007**  
**ISSUE 05**

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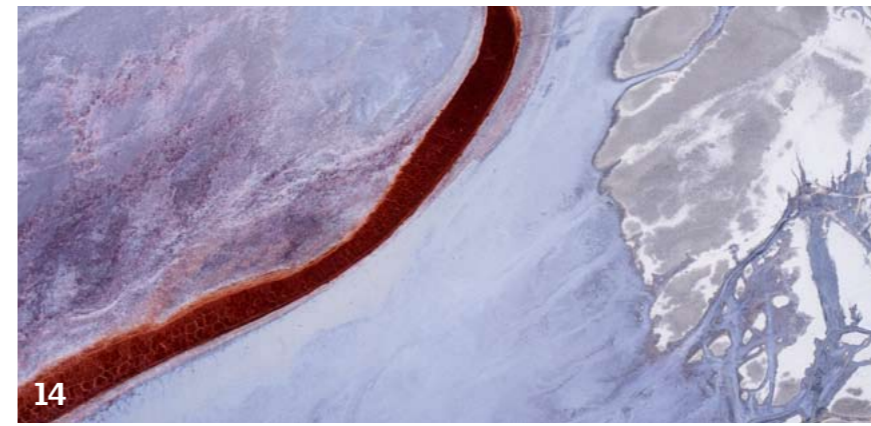
**NOW**

What is probably **Le Corbusier's** last masterwork has been inaugurated in Firminy, France. The **Haus der Kunst** (House of Art) in Munich invites the public to the **Andreas Gursky** retrospective. An apartment house in Mexico City has been decorated with hand-blown glass balls, another in Munich with silk-screen printed chestnut-tree leaves. Plus: The new concert house in Badajoz by **José Selgas** and **Lucia Cano** is an underground but bright and airy building.



**MANKIND & ARCHITECTURE**  
**CERTAIN SLANTS OF LIGHT**

Ideologies, as well as light conditions and building traditions that differ from region to region, have had a decisive influence on how light and surfaces have been handled in architecture. In his article, **Richard Weston** explains how architects have negotiated the difficult terrain between honesty of design and sophisticated disguise and how they have worked with light and shadow, reflections and translucency.



**DAYLIGHTING**  
**BENEATH**

What happens when light meets a surface? How profound is its effect? And how has our perception of textures and light altered in the course of the centuries? An essay and 13 interviews with artists, architects and scientists throw some light on the matter.



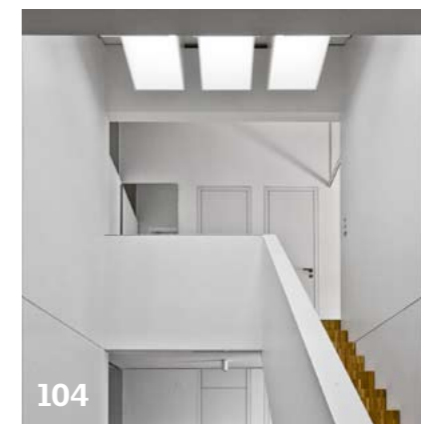
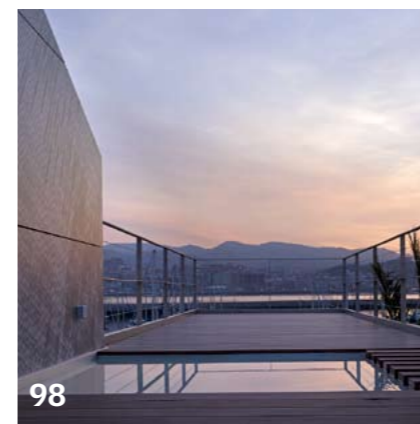
**REFLECTIONS**  
**IMAGE AND REALITY**

Two-dimensional images will continue to determine the way we perceive architecture, according to **Ivan Redi** – because they help us test our personal concepts of reality. In his article, Redi describes the approach adopted for the presentation of architecture over the last 250 years – from Piranesi's 'Carceri' to today's photorealistic light simulations.



**VELUX INSIGHT**  
**WITHIN HEAVY WALLS**

The **archaeological museum** in the castle of **Brie-Comte-Robert** was not built for eternity. But despite its lightweight design, which will make it easy to remove quickly when the time comes, it still possesses all the qualities of a normal museum – the most important being a pleasant atmosphere and rooms full of daylight.



**VELUX PANORAMA**

**Becker Architekten** designed **Klimczyk house** in Rieden to the principle of a convertible car. The larchwood panelling of the large loggias can be folded completely to one side. **Atika**, the mobile concept house, also strikes the eye due to its outwardly differentiated architecture that matches the movement of the sun. It proves that lightweight construction can make sense in southern climates as well.

The things that make architecture tick: events, competitions and selected new developments from the world of daylighting.



PHOTO: FERNANDO CORDERO

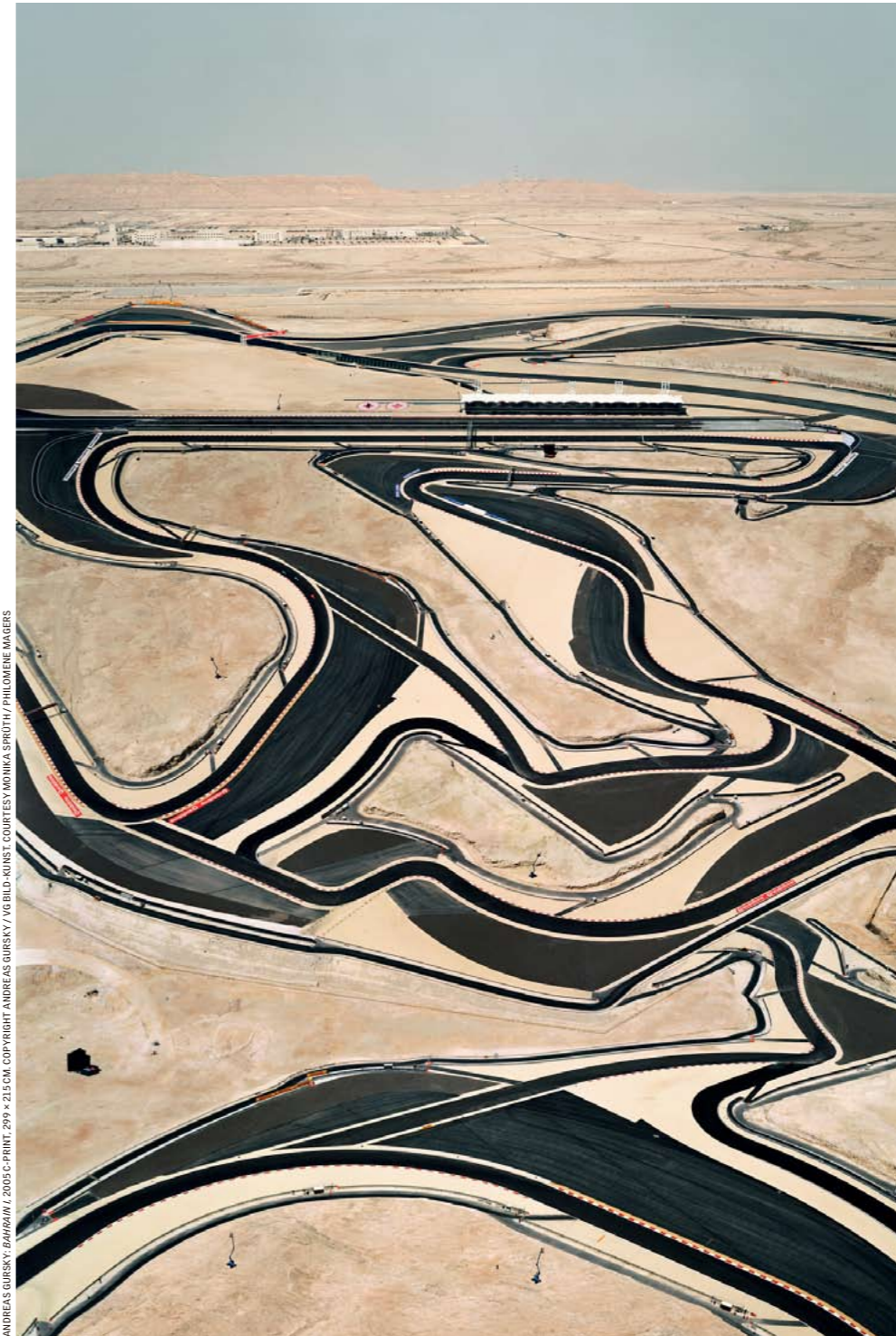
## FAÇADE ART, HAND BLOWN

Let it not be said that handcraft no longer has a role to play in modern civil engineering. In the Colonia Polanco in Mexico City, Alejandro Vilareal and his architecture and design office Herve Diseñeria recently completed the 'Hesiodo' apartment building, whose rugged concrete facades are adorned with a total of 7,723 hand-blown glass balls resembling a grand-scale curtain of pearls. Alejandro Vilareal drew his inspiration for this unusual facade decoration that gleams in the sunlight from the streets of his native city: "The idea is taken from the experiences of walking through a market in Mexico City and seeing how the fruit and vegetables are set out; from seeing a picture of children playing with soap bubbles in a public square; from observing the Mexican culture's ceaseless effort to

construct its reality through repetition; from the need to incorporate magic and innocence in our everyday life, and mainly from remembering that beauty can be present in our daily lives if we give it a chance."

The building is situated on a small street in a residential area of Mexico City, not far from a busy shopping area. His two building sections – a four-storey frontal building on the north side and a five-storey rear building on the south side – accommodate 13 flats and an underground garage. A centrally positioned block with lobby, stairs and elevators connects the two building sections with each other. The northerly and lower of the buildings features a roof terrace that can be used by all the residents for celebrations or events. The fragile glass ball curtains provide the

north and south facades of the building, as well as the roof terrace, with a degree of privacy. Viewed from within, they mellow into a kind of soft green veil in front of the – at times – seemingly chaotic urban panorama of Mexico City. The balls were produced in a glass blowing workshop in Guadalajara and then attached to wire cables with commercially available nuts and an intermediate EPDM rubber layer. Each of the tensioned cables in front of the facades carries a maximum of 27 balls. According to Alejandro Vilareal, the unusual facade construction has so far not suffered any ill effects from the weather – although the cleaning procedure is somewhat more time consuming, taking about twice as long as for a normal facade.



ANDREAS GURSKY, BAHRAIN, 2005. C-PRINT, 299 x 215 CM. COPYRIGHT ANDREAS GURSKY / VG BILD-KUNST. COURTESY MONIKA SPRÜTH / PHILOMENE IMAGERS

## ANDREAS GURSKY IN THE 'HAUS DER KUNST'

Andreas Gursky was born in 1955 and his photography of monumental architectures, huge throngs of people and dazzling worlds of consumption, mostly captured from above and reproduced in large formats, have made him the most successful living photographer – at least in terms of the prices his images command at auction. From now until 13 May 2007, the Haus der Kunst gallery in Munich is displaying a collection of his works consisting of 50 photographs. "Even bigger" reads one of the guiding themes of the new Gursky exhibition: covering 1,800 square metres, the opulent exhibition area is not the only aspect that is big – much of the photographic material has also been reworked and reproduced in a larger format utilising the possibilities available today. The largest of these now measure 188 x 508 centimetres.

In the early 1980s, Andreas Gursky studied at the State Art Academy in Düsseldorf under Bernd and Hilla Becher. However, Gursky soon broke away from their minimalist, strictly documentary style of photography and began to capture the commodity culture, architecture and cultural landscape of mankind in carefully composed monumental pictures, which he digitally reworked in order to sharpen the images' statements. In Gursky's images the individual becomes a co-player in seemingly scaleless machinery that can appear as a raving mass of people or just as easily in the form of an oversized hotel foyer or the trading floor of a bustling stock exchange.

Planned future venues for the Andreas-Gursky exhibition currently on display in Munich are the Istanbul Modern, the Sharjah Art Museum, the House of Photography in Moscow and the National Gallery of Victoria in Melbourne.



PHOTO: KATHRIN SCHÄFER

## ROADSIDE GREENERY AS A WORK OF ART

During the course of the post-war decades the Gabelsbergerstraße in the Munich district of Maxvorstadt has become a 'race track' for through traffic. Thousands of vehicles use this one-way street every day in order to reach the inner city. Not even a tree softens the dreary road area that is flanked by not particularly attractive post-war buildings, one of which was, for a long time, the building at Gabelsberger Straße 30: during the 1970s its facade had been 'decorated' with a diamond pattern in ochre and brown, yet appeared drab and bare.

In 2004, the young Munich architect Jakob Bader was commissioned to renovate and upgrade this five-storey residential property. The starting point for Bader's design was the glaring lack of roadside greenery. Trees, an avenue, he surmised, would provide shade, reduce traffic noise and give the whole street area a more attractive character. Since it was not possible to simply plant trees by the pavement, Bader commissioned the photographic artist Kathrin Schäfer to create chestnut greenery images. These avenue and beer garden trees that are so popular in Munich were to be printed as images on glass displays and thus give the residents at

least the feeling of living "in a green area". Decorators painted the building in a fresh green tone and a fitter mounted some 120 running metres of steel rails, like railway tracks in front of the facade. These provide the runners for the 56 printed-glass sliding shutters: a moveable avenue, vibrant and lush and casting wildly romantic leaf shadows towards the inside that are, at first glance, indistinguishable from the original.



PHOTO: ROLAND HALBE

## ILLUMINATED WREATH ON WALL COPING

Badajoz, the Spanish-Portuguese border town on the banks of the Guadiana river, has retained its protective external appearance even in these times of European unity. The town centre is surrounded by an extensive defensive wall that was constructed during the Portuguese War of Independence from 1640-68 and modelled on the design by the French engineer Vauban. In subsequent centuries it did not always only serve military purposes: in the 18th century one of the far reaching bastions was given a circular recess that could be used as a bullfighting arena or an open air theatre or indeed as a congress centre: as stipulated in the conditions of the architects' competition in 1999, won by the selgascano office run by José Selgas and Lucia Cano. "Everything we were looking for, was always already there – right before our very eyes," explain the architects today. Consequently, the circular 'hole' not only provided the shape for the new building but also enabled the nearly 17,500 square metres of floor space and the up to 25-metre high stage house of the auditorium to almost completely disappear within the interior of the bastion. Indeed from the

outside, the building is only recognisable by two translucent plastic cylinders. The outer cylinder, which in fact only serves as a sight screen and shade provider, consists of thin, fibre-glass reinforced polyester rods on a steel base construction. The second, inner cylinder acts like a spatial concentration of the first one; it consists of translucent polyacrylate that during the day becomes a huge projection area for the light and shadows beamed in from outside, and at night, artificially backlit, beams light back out again. The selgascano office displayed extreme artistic skill by enabling daylight to reach even into the rooms located deep within the old bastion, in particular into the large 1,000-seat auditorium below the acrylic glass cylinder. Entering through a round skylight, the daylight then falls on a wave-like curved and ribbed ceiling that disperses the light evenly throughout the room. Furthermore, the projection of the round 'sun spot' remains visible from inside throughout the day and enables the delegates to track the path of the sun around the building.

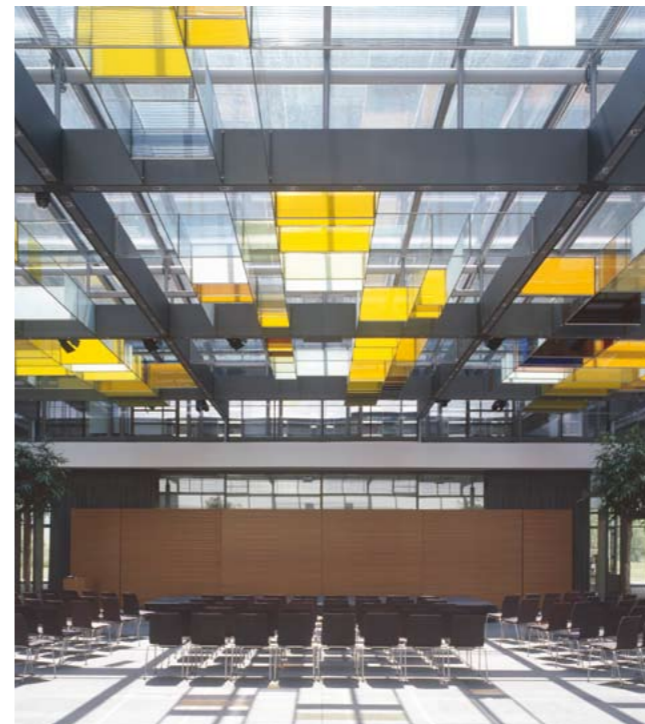


PHOTO: ROLAND HALBE

## LIGHT MUSICAL SCALE

In recent months, an industrial area of a different kind has come into being on the Mühlbachäckern in the southern part of the university town of Tübingen. The site is centrally located yet surrounded by a park and has attracted not only private companies but also the Tübingen district administration office. The largest building on the site, the new headquarters of the Tübinger Stadtparkasse bank, was designed by the Stuttgart architects Auer+Weber+Assoziierte and is, from an external perspective, not exactly conspicuously extravagant. The square-shaped floor plan of the six-storey cube is surrounded by a freestanding steel frame that incorporates the sunblinds and is also unusually strongly reminiscent of the later works by Mies van der Rohe from the USA. And in terms of openness the new building certainly embodies the Mies-like spirit: as long as the sunblinds are not blocking the line of sight, the office workers can enjoy an uninterrupted view towards the outside through triple-glazed floor to ceiling windows. The interior rooms are exceptionally spacious by German standards; separated, individual rooms were only allocated to executive staff.

The light-flooded heart of the so-called Sparkassen Carré is the glass-roofed forum in the inner courtyard that can accommodate 500 people and is used for events. However, it is not only the occupants that fill this room with life: the 'chromatic scale' glass sculpture by the artist Bernhard Huber integrated into the glass roof filters and colours the incoming daylight in a sunny yellow tone. The English word scale can be used both in a dimensional and a musical context, and this is how Huber would like his work of art to be interpreted. He subdivides the glass roof into individual parallel strips within which clear, white and yellow glass areas alternate in irregular rhythms. "Similar to a melody, there are multi-level interactions in the style of the various spatial glass-bearing arrangements," explains Huber. In its entirety, the "chromatic scale" is thereby reminiscent of the abstract notation of a piece of music or of the decibel scale of an electronic amplifier – though in any event the artist demonstrates his reverence for a building in which everything centres around numbers and scales.

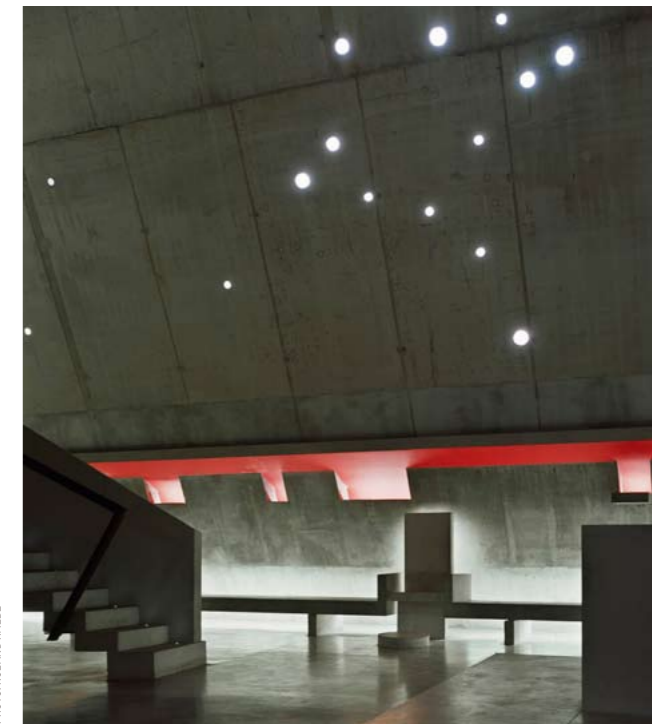


PHOTO: ROLAND HALBE

## BELATED MASTERPIECE

For almost three decades, the Saint-Pierre church, planned by Le Corbusier in 1962-64, stood as a half-finished ruin in the small working class town of Firminy, on the eastern fringe of the French Massif Central. It was supposed to have formed the final stone for Firminy-Vert, a town expansion scheme that began in the 1950s in the spirit of the Charter of Athens, to which Le Corbusier also contributed a stadium, a culture centre and a Unité d'habitation.

The €7.6 million completion of the building was made possible not least by state subsidies. In view of the fact that in strictly laical France, such funds are not permitted to be used for sacred buildings, Saint-Pierre officially counts as a museum. The basement that was originally intended for the parish meeting rooms, is now home to a branch of the Musée d'Art Moderne in Saint-Etienne as well as a Le Corbusier museum. The church itself has been consecrated, yet it is doubtful whether any religious service will ever take place here. Under its towering, angularly supported conical roof, opens up a cave-like space of exposed concrete, which, during the day, is only illuminated by a few daylight openings. Narrow, head-high,

all-around window slits visually detach the roof from its substructure. Via the rough exposed concrete of the vault, light strikes out from four loftily positioned 'light canons' – concrete pipes of various diameters with interiors painted in red, yellow, blue and green. The light scenery in St Pierre is supplemented by a 'starry sky' in the eastern wall, above the altar: the design of small round openings in the concrete shell represent the star constellations Orion and Gemini that are to be seen in this direction in the night sky.

The overall management of the building of the church was undertaken by José Oubrierie, one of Le Corbusier's former employees. The Le Corbusier foundation, grail-keeper of the architect's legacy, has already given its plaket for the building. Despite some "personal amendments and corrections by Oubrierie," writes the architecture historian Gilles Ragot, who was commissioned by the foundation to compile a report, "the church itself [...] is of a quality and spatial originality that are to be found in the greatest works of Le Corbusier and in modern culture."

## CERTAIN SLANTS OF LIGHT

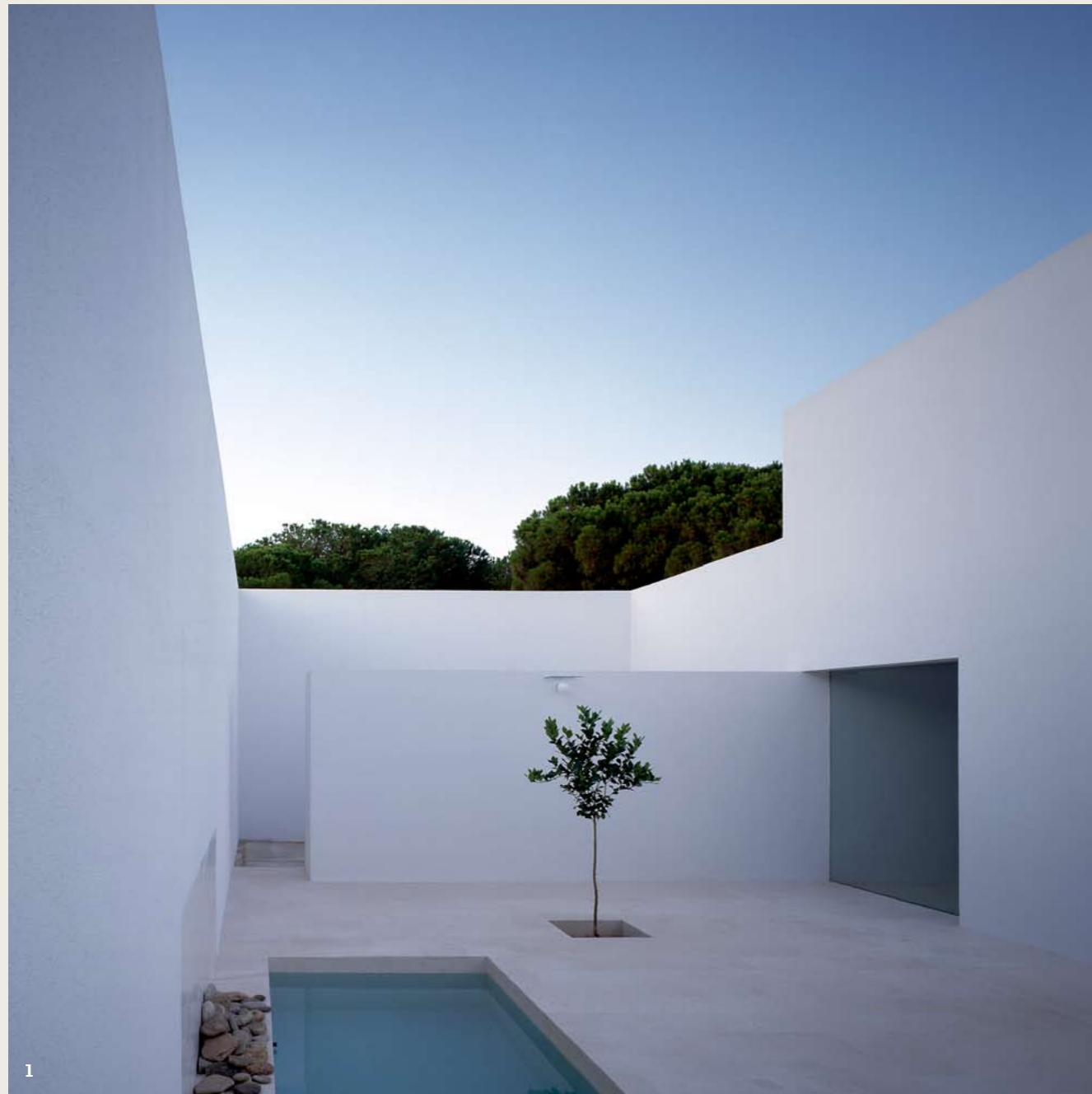


PHOTO: HISAO SUZUKI

Text by Richard Weston .

It took Jørn Utzon three years to develop the tiles that cover the shells of his Opera House in Sydney, and to make their interaction with the ever-changing daylight match his ideas. Utzon's Opera is only one of many examples for the sensibility of 20th century architects in their play with textures and light. Their often experimental treatment of material surfaces relates to such diverse factors as solidity and dematerialisation, the genius loci, the human perception and concerns about energy.

LECTURING IN 1919 on the subject of textures at the Royal Danish Academy of Art, Carl Petersen, architect of the exquisite Fåborg Museum, discussed the "unpleasant effects" that result from "uncertainty of texture" – as, for example, when a mountainous landscape appears below the surface of polished granite due to the unequal transparency of different elements in the stone. "With regard to material," he asserted, "the goal ought to be solidity of the surface": clarity of form demands unequivocal surfaces, modelled by light and shadow and perhaps enriched by changes of colour and texture, but not prone to "vague or fortuitous effects".

By coincidence, in the same year as Petersen's lecture, Mies van der Rohe completed a competition project for a glass tower on Berlin's Friedrichstrasse in which just such effects were proposed as the basis of a radically new architecture. The building's irregular, faceted profile was designed to create an ever-changing tapestry of reflections in an effort, we might conjecture, to echo the ebb and flow of the city that had been a theme of Modernism since Baudelaire.

Although voiced in the north, Petersen's call for solidity was grounded in the virtues of that southern constancy of light that ensured vigorous modelling by shade and shadow, to which effects of texture and colour were always seen as secondary. Such, at least, had famously been made clear in Alberti's 'Ten Books', whose advocacy of whiteness as the expression of architecture's highest values would become the watchword of Neo-Classicalists. Mies's handling of glass, by contrast, was attuned to the fugitive qualities of northern light – qualities, a decade later, he conjured under southern sun in the Barcelona Pavilion, where the complex interplay of light transmitted through coloured glass and reflected from polished, highly figured stone and reflecting pools created the most richly atmospheric space in twentieth century architecture.

THE LIGHT OF THE NORTH VERSUS THE LIGHT OF THE SOUTH:  
FOUNDATIONS OF EUROPEAN MODERNISM

If the contrasting poles of north and south, of dematerialisation under atmospheric light and clear forms modelled by sunlight and shadow, can be said to define the poles of (European) architectural expression, then, complementing the familiar

narrative of spatial and structural innovation, the twentieth century can be seen as a story of architects' determination either to exploit the expressive potential of materials and textures or, by radically suppressing them, to place architectural surfaces wholly at the service of natural light.

The latter impulse has infused architectures of north and south alike. In Finland, for example, Juha Leiviskä has developed a De Stijl-like language of seemingly weightless planes animated by light. In the Myyrmäki Church, these are all white, mesmerisingly so: "My objective," Leiviskä says, "has been to reproduce an insubstantial 'veil of light'", and his model is the double-shell construction of Rococo churches. In a later project at Kuopio, he applied colour to the hidden sides of the planes around the altar, suffusing the surroundings with a gently coloured glow – an effect Steven Holl subsequently emulated in his Chapel of St Ignatius in Seattle.

Faced with the high, intense sun of southern Spain, Campo Baeza conceived the Gaspar House in Zahora as a walled paradise garden. But in place of a colourful profusion of plants and flowers, he relied entirely on natural light and water to evoke the presence of nature. Paved inside and out with the palest of limestones and framed by seamless, white-rendered walls, the interior is lit only by four large openings, creating what Baeza calls a "horizontal light". By eliminating shadows the forms are all but dematerialized, heightening our awareness of the subtlest variations in the colours of the light.

Campo Baeza's house, completed in 1991, can be seen, in part, as a reaction against the increasingly assertive material qualities that had marked various strands of post-war architecture. Pioneered by Le Corbusier, with the *béton brut* of the Marseilles Unité and 'peasant' brickwork of the Jaoul Houses, this interest in material expression was often at its most persuasive when combined with a determination to respond to local conditions and evoke a heightened sense of place.

At Säynätsalo Town Hall, for example, Alvar Aalto specified that all the bricks were to be laid at slight angles to each other resulting, in grazing sunlight, in a textured surface of extraordinary vigour. Later, with Seinäjoki Town Hall, the surfaces are even more acutely attuned to northern light. The elevated, wedge-shaped block is clad with dark-blue glazed tiles. A squashed half-round shape in cross-section, they were

**1. Alberto Campo Baeza: Casa Gaspar in Cadiz (1992)**  
 In Campo Baeza's house, smooth surfaces, perfect symmetry and immaculate white create the framework for the natural surroundings, which are reduced to their quintessence.

laid vertically to create a striated surface that exploits the low sun and, thanks to their reflective surfaces, produces a volatile character reminiscent of corduroy fabric. When sunlight falls obliquely across its surfaces, the building appears as a solid mass of Prussian blue; whereas in direct sun, the narrow intervals of light-coloured render between the tiles become dominant, and the blue is all but drained away.

In the celebrated 'experimental walls' of his summer-house on Muuratsalo, Aalto played a more personal game, arraying a catalogue of bricks, plain and glazed tiles, and styles of pointing to create surfaces whose character shifts constantly, if subtly, with the movement of the sun. It can be seen simply as an abstract composition of texture and colour, but is also an intense evocation of place – not of Finland, but of the patched, timeworn walls of Aalto's beloved Italy. Why else does the rectangle of ultramarine tiles need an exposed lintel, other than to suggest that it is a window to the southern sky?

**LIGHT AND GENIUS LOCI:  
 THE WORK OF CARLO SCARPA**

In Carlo Scarpa's work, the evocation of place is grounded in the building traditions of Venice, where the 'incrustation of brick with more precious materials' – to quote John Ruskin – was both a consequence of the city's remoteness from quarries, and the means of creating an all-pervasive floating lightness. You sense it everywhere: in the diaper-patterned cladding of the Doge's Palace, light as stretched fabric; the polychrome Cosmati pavements that seem like a petrification of broken reflections in water; and in that Venetian speciality beloved of Scarpa, terrazzo – *pavimenti alla veneziana* – which seems to be coated with a thin film of rain. In the shop he designed for Olivetti in the Piazza san Marco, Scarpa fused terrazzo and mosaic by laying tesserae of small, irregular squares of reflective glass paste in parallel bands in a bed of light-coloured cement mortar. The banding creates a marked 'warp' in one direction, whilst the irregularity and wide spacing of the tesserae read as an undulating 'weft' that subtly evokes the murmur of water.

For the ceilings of the gallery of the Querini Stampalia Foundation, Scarpa revived another local tradition, *stucco alla veneziana*. In the variant known as *marmorino*, marble pow-

"The light in this house is horizontal and continuous, mirrored by the east-west orientation of the courtyard walls. Simply, a horizontal, continuous space is tensed by a horizontal light."

Alberto Campo Baeza

der is mixed with the topcoat and yields a stone-like hardness, which is enhanced by a reflective sheen imparted with a hot iron. The result is both practical – it can absorb large amounts of water from humid air – and supremely responsive to light.

A determination to attune materials to place can even be discerned in the late churches of Sigurd Lewerentz, where the bricks appear to float in a matrix of mortar and rhyme subliminally with the irregular markings on the trunks of the birch trees. At Klippan, appreciation of the dry, rough brickwork is heightened by contrast with the unframed double-glazing units that are laid over, rather than in, the window openings. The greenish cast of the glass mingles with reflections of grass, trees and sky, transforming the elemental windows into pools of liquid light.

At Sydney Opera House we encounter something similar, but on the grandest possible scale. The reconstructed red sandstone cladding of the great platform grows out of the local geology, and offers a visually stable foil to the reflective tiled surfaces of the shells. Jørn Utzon's inspirations were both architectural and natural: the tiled domes that appear to float ethereally above the mud-brick cities of the Middle East; and snow-covered mountains – in particular, the subtle contrast that results when smooth, freshly fallen snow is blown aside to reveal the frozen surface below.

It took three years to develop the tile he wanted, and the result was a combination of plain and glazed versions, the former cut to accommodate the tapering geometry of the underlying ribs, the latter a square infill, laid diagonally, and with a randomly irregular surface thanks to inclusions of small pieces of crushed, previously fired clay. Arrayed with perfect smoothness across the shells' spherical surfaces the cumulative effect is miraculous, uncannily responsive to the colours of the sky and to the interplay of shadow and reflected light between the shells. Their surfaces glow, gleam and flash with light and, as you walk by, successive waves of tiles scintillate like diamonds.

**AUTONOMY OF MATERIAL:  
 ARCHITECTURE SINCE THE 1980S**

For all their attention to the qualities of material and light, in the work of Aalto, Lewerentz and Utzon these traditionally



PHOTOS: 2/3 – PAUL WARCHOL PHOTOGRAPHY; 4 – MARTTI KAPANIEN; ALVARO AALTO MUSEUM; 5/6 – RICHARD WESTON; 7/8 – GASTON WICKY; 9 – HISAO SUZUKI; 10 – STEVEN HOLL ARCHITECTS.

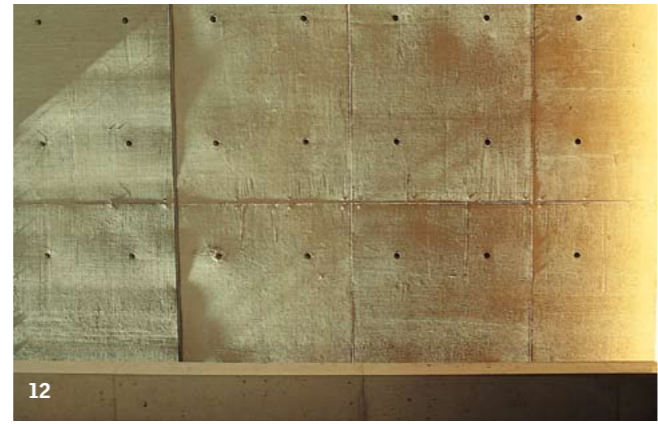


secondary architectural qualities remained in the service of a larger idea, while with Scarpa that idea was, as often as not, provided by the frame of an existing building. Amongst a generation of architects that emerged in the 1980s, however, the expressive possibilities of materials were to become the leading idea. A key inspiration was Minimalist art, and the work of Donald Judd in particular. Challenging the separation of means and structure, Judd wanted the aesthetic effects of his work to flow directly from the viewer's unmediated experience of visual 'facts' – as, for example, in the interplay of reflections and shadows in an installation of open-topped aluminium boxes.

By reducing buildings to simple or familiar forms, and covering them in a single material, the architectural interest could be focussed almost entirely on surface qualities and the play of light. Vertically or horizontally-slatted timber boxes – as in Peter Zumthor's enclosure for Roman remains at Chur, or Burkhalter and Sumi's extension to the Zurichberg Hotel – that appeared closed by day could glow mysteriously at night. Similarly, in Herzog and de Meuron's winery in the Napa Valley, massive and seemingly opaque gabion walls are revealed as unexpectedly permeable transmitters of daylight.

As interest shifted from opaque, matt materials to reflective, transparent or translucent ones, the expressive range expanded. Deploying structural glass planks as a rain-screen around their extension to the art gallery in Winterthur, Gigon/Guyer created a skin that is both richly striated and subtly layered, and which, as it reflects the surroundings and ambient light, seems to become a transmitter rather than receiver of light. Similar, if less arresting, effects were achieved at the Liner Museum in Appenzell by cladding both the walls and saw-tooth roof in square, stainless steel plates. For the art museum in Bregenz, Peter Zumthor used a glazed outer skin made of identically-sized, storey-height sheets of glass that act as a translucent veil to the circulation spaces behind. The facades respond subtly to changes in light, but are transformed towards sunset, when they glow from within.

Emulating these Swiss models, at the Bloch Building extension to the Nelson-Atkins Museum of Art in Kansas City, Steven Holl placed five rectangular, glass-plank-clad volumes in the landscape. They act as roof-lights to a largely underground building, and by specifying iron-free glass the green



tint that is so obvious in Winterthur has been eliminated, and with striking results: whereas Gigon/Guyer's building interacts optically with its environment, Holl's stands in crystalline contrast to the landscape.

This crystalline quality of Holl's 'lenses', as he calls them, is enhanced by the fact that the glass planks are more obviously part of a constructed order: after almost two decades of seductive rain screens of almost every material imaginable, and ranging between the formal extremes of 'Swiss boxes' and Frank Gehry's baroque draperies, could it be that the satisfactions of the manifestly built as opposed to the seductively designed are reasserting themselves? Recalling the pleasures of standing between Tadao Ando's concrete walls, in the exquisite Koshino House above all, or beneath the white-painted concrete vaults of Jørn Utzon's Bagsværd Church, I cannot help feeling that there is something more deeply satisfying about their hard-won forms. Both are structural and bear the marks of their making, of bolt-holes and boards, and both are transfigured under certain slants of light. Nowhere, perhaps, is the transforming power of light more vividly experienced than standing beneath the porch of Louis Kahn's Kimbell Art Museum, watching a crescent of sunlight move across the concrete and travertine surfaces: Kahn famously declared that 'the sun never knew how great it is until it struck the side of a building', and at Kimbell you understand what he meant.

#### LIGHT AND ENERGY:

##### MATERIAL EXPERIMENTS IN THE SERVICE OF ECOLOGY

Beyond these explorations of the visual interactions of materials and light, a new, barely prospected territory is being opened up by developments in materials science. At a glance, the senior citizens' apartments by Dietrich Schwarz in Domat might be taken for a conventional essay in Swiss modernism. In fact, the building's south-facing elevation alternates floor-to-ceiling glass with triple-glazed panels that incorporate a salt hydrate which, in its liquid state, can store solar energy. As the temperature drops the solution crystallise, turns from transparent to opaque and releases heat in the process.

Such phase-change materials are just one strand of many innovations that are opening up new ways for building sur-

**Richard Weston** is Professor of Architecture at Cardiff University and editor of *Architectural Research Quarterly* published by Cambridge University Press. His books include a Sir Banister Fletcher Prize-winning study of Alvar Aalto; *Modernism; Materials, Form and Architecture*; and *Utzon. Inspiration, Vision, Architecture*. His current work involves the exploration of natural materials as sources of designs for various digital manufacturing techniques: these are discussed in his latest book, *Formations: images from rocks*, and at [www.naturallyexclusive.com](http://www.naturallyexclusive.com).



faces to interact with natural light. Some are expensive and exotic, such as the holographic optical elements whose colour varies according to the angle of view and position of the sun, and could bring to architecture something of the pixellated character of chameleons' skins or butterflies' wings. But others, like the printed films being developed in the UK by Digital Glass, should prove highly cost-effective and promise to outperform existing systems of solar protection and open up new visual possibilities – from turning glazed facades into vast images, to partitions that provide visual privacy while remaining permeable to light.

Self-cleaning materials – for so long a holy grail of glass manufacturers – are now being engineered by harnessing daylight to create a hydrophilic surface that promotes the washing of the building facade. The most successful to date, based on titanium dioxide, offer the added bonus of generating oxygen and breaking down pollutant gases, and could make a substantial contribution to promoting cleaner air in cities.

From the extremes of minimalist essays in whiteness to the fascination with the visual properties of a bewildering array of materials, recent architecture might seem to have prospected the limits of the interaction of materials and light. But as new generations of 'smart' materials become widely affordable, hitherto unimaginable possibilities for both building performance and architectural expression will invite exploration.

**2-3. Steven Holl Architects: St. Ignatius Chapel in Seattle (1997)**  
Glancing light entering the church through wall slits and narrow windows reveals the irregular structure of the plaster surfaces on the walls and vaulted ceilings.

**4. Alvar Aalto: Experimental House in Muuratsalo (1953)**  
Alvar Aalto uses the brick wall in his summer house on Muuratsalo island as an experimental area for different brickwork compositions and their interaction with light.

**5. Sigurd Lewerentz: Klippan Church (1966)**  
The walls, floors and vaulted ceilings, all of dark brickwork, endow the church interior with a cave-like atmosphere.

**6. Jørn Utzon: Opera in Sydney (1973)**  
The opera house's lighting and colours, which change continually in the course of the day, are primarily due to the tile paneling that Utzon spent three years developing.

**7-8. Gigon/Guyer: Liner Museum in Appenzell (1998)**  
The scale-like skin composed of chrome steel plates contrasts with the industrial aura emitted by the shed roof shape of the museum and gives it the appearance of a casket shining in the sun.

**9. Peter Zumthor: Kunsthau in Bregenz (1997)**  
In his art museum cube, Peter Zumthor plays with the phenomenon of layering and translucence. The shell gives only a vague inkling of the building's inner structure.

**10. Steven Holl Architects: Bloch Building, Kansas City (2007)**  
With no sense of scale but a feeling of the immaterial conveyed by its glass facade, Steven Holl's museum extension breaks with the tradition that such buildings should serve a specific representative purpose.

**11-12. Tadao Ando: Koshino House in Ashiya (1981)**  
The concrete surfaces of Tadao Ando's early house do not quite achieve the satin-like smoothness of his later buildings. Its structure becomes apparent when hit by glancing light.

**13. GLASSX AG, Dietrich Schwarz: apartments for senior citizens in Domat/Ems (2004)**  
For the translucent facade surfaces of this residential facility, Dietrich Schwarz used salt hydrate to store heat. It changes its physical condition when subjected to heat and can thus absorb heat without itself becoming hot.





# Beneath

By Jakob Schoof.

Surfaces are regarded as the epitome of surface beauty and fleeting impressions. Nevertheless, they are the basis of how we perceive the world: a journey to the surfaces of the earth and what lies beneath them.



*Previous page*  
*David Maisel: The Lake Project*  
*9816-11, 2002. The earth is*  
*bleeding. For decades, Owens*  
*Lake in California has been used*  
*as a reservoir to supply drinking*  
*water to Los Angeles. Today,*  
*the highly contaminated bed of*  
*the lake, now mostly desert, is*  
*an eyesore of black veins, blis-*  
*ters and puddles turned red by*  
*the bacteria that thrive in them.*

*Opposite*  
*Antennae Galaxies. Photo by the*  
*Hubble Space Telescope.*

PHOTO: NASA/JPL

Surfaces of things constitute our image of the world. Their interaction with light provides us with more than three quarters of our sensory experience, but also with the energy that we live and feed on. In nature as in technology, surfaces act as communication interfaces, providing a means of exchanging matter and information. The metabolism of any living creature will inevitably involve its surface – be it through evaporation, the intake of sunlight energy or food, or heat exchange.

But it has been a long time since the surfaces of our world were determined solely by the laws of nature. In an alternating process of give and take, we learn from the surfaces of nature and shape them according to our wishes. Swimsuits are modelled on sharkskin, dirt-repellent fabrics on lotus leaves and anti-microbial plastic-film wrapping on ostrich eggs. At the same time, there is little of the earth's surface that has not been transformed by human beings – some scientists envisage the oceans themselves being transformed into huge algae farms. Almost any surface can today be created artificially, even some that appear to have no immediate or future application. But it is our ability to interpret surfaces correctly that is, and will continue to be, decisive for the survival of our planet. So it is worthwhile taking a look beneath the surfaces of our world.



PHOTO: DAVID MAISEL

## CHANGING VIEWS OF THE WORLD

It took Galileo Galilei only a small apparatus to change the human perception of the world. In 1609, the Italian mathematician and astronomer turned one of his first self-built 'perspective glasses' – telescopes we would call them today – to the moon. In doing so, he observed that the earth's companion was by no means the smooth, immaculate sphere it should have been according to the theories of Aristotle, which, despite their pagan origin, medieval Christian society still adhered to. In his scripture 'On the Heavens', the Greek philosopher had outlined a concept of the world that was to be valid for nearly two millennia: the earth, as the immovable centre of the universe, is surrounded by concentric strata: first, the four elements (earth, water, air and fire), and then the seven planetary spheres: the moon, Venus, Mercury, the sun, Mars, Jupiter and Saturn. From the moon onwards the universe consisted of an ethereal, indestructible quintessence, literally: the fifth element or substance, which is only capable of moving in perfect circles. As they consist of quintessence, all celestial bodies must, by nature, possess a perfect and immaculate spherical shape.<sup>1</sup>

In the light of this, Galileo's findings were alarming news: he discovered found out that the moon's surface was rugged and full of craters, 3,000 of which on the visible side of the moon alone have so far been identified and named. (This newly discovered texture has nothing to do with the apparent 'face of the moon' which can be seen with the naked eye. It is formed by four dark patches that were probably caused by large flows of basalt lava some four billion years ago). Galileo went on to more discoveries that made Aristotle's theories obsolete; most notably, Jupiter's moons and the sunspots. Not

even the sun, which had been considered an immaterial source of divine light by medieval scholars, turned out to be no more than a "rock of fire", as Anaxagoras had called it 2,000 years before.

Galileo's findings not only precipitated the Catholic church into the deepest crisis it had ever known, but also marked the transition from the transcendental and mystical concept of light of the Middle Ages to the "scientific light" of the Modern Ages. Prosecuted by the Inquisition, Galilei had to abjure his heretical teachings in 1633. The fact that his writings remained on the Vatican's index of forbidden books for two more centuries, and that Galileo was only officially rehabilitated by Pope John Paul II in 1992, is remarkable. It shows the importance that the Church attributed to the interpretation of light: if light no longer originated from a divine source but from profane matter, and if heaven was no longer a sphere strictly separated from the Earth, then where would God be? Besides their obvious fear of losing the monopoly of interpreting heaven and earth, the clergy's reaction to Galileo's findings also highlights a general problem of human perception: seeing is not sufficient, on its own, for recognition. Recognition happens when a visual image is compared to the understanding of things that is inherent in the human brain. This insight is not new; the philosophy of Plato, Aristotle's teacher, was already based on this duality of phenomena (which are accessible to our senses) and ideas (which are only accessible to the human intellect). Plato claimed that universal ideas exist apart from – and preceded all – particular things. Our lack of universal ideas also inhibits our understanding of phenomena, as the reactions of many

**Opposite David Maisel: Terminal Mirage 980-1, 2003**  
David Maisel has been photographing the landscape of the Great Salt Lake in Utah, USA since 2003. There is hardly anything to suggest the scale, the location or the purpose of the subject photographed; indeed the images are codes for the continually spreading influence of human beings on the natural environment.

of Galileo's contemporaries showed. They did not believe his observations, and even less the conclusions he drew from them, not only because they considered them potentially dangerous, but because they had no 'idea' that might have made the observations fit their understanding of the world. More recent evidence highlights the necessity of both ideas and phenomena for human perception: people who are blind from birth, and then gain eyesight through an operation after having lived in the dark for years, often have a hard time learning to make use of their new sense. They may see images, forms and colours, but cannot interpret their meaning until they have verified their perception by other senses, most notably, the sense of touch.

<sup>1</sup> See Arthur Zajonc: *Catching the Light*. Oxford University Press 1993, p. 73–76.

## TERRA INCOGNITA: THE UNKNOWN PLANET

350 years after the discovery of the moon's craters, man's first trips into space marked a no less important turning point in history. For the first time, our planet was seen as a whole – not only by means of maps, globes and other models, but with the naked eye. The first images of Earth from space, as a unique 'water planet' with no visible geopolitical boundaries, an interconnected seamless whole, gave people a sense of both the beauty and the vulnerability of their home. Since then, satellites have gathered a huge amount of data about the Earth – from vegetation to air pollution, and even the geologic formations beneath the planet's surface. Websites like Google Earth have enabled us to travel to almost any given site on earth and visually explore it in detail. However, despite the rapidly increasing amount of scientific evidence, models, and images (which, to make things worse, we often perceive as threatening), we are finding it hard to form a coherent idea of the Earth's surface and of the tremendous (and nowadays often man-made) forces that shape and change it. This becomes evident when we look at the works of such photographers as David Maisel. His 'black maps' of highly contaminated areas such as the Great Salt Lake in Utah, or Owens Lake in California, show us rugged, blistered textures in red, black and white that we find hard to interpret although they are, to a large extent, man-made. What is originally perceived as beautiful suddenly turns into something repellent when we become aware of what we are actually seeing. "The ground is bleeding. A red river cuts a path through a bleached valley, winding toward a lake that is no longer there. Seen from the air, the river and its dry terminus appear other-worldly," wrote Diana Gaston about

Maisel's 'Lake Project' series in the magazine 'Aperture'.<sup>2</sup> Maisel himself describes his work on the boundary between beauty and destruction as follows: "I became interested in making images that could be harsh or confrontational, while continuing to maintain their formal elegance and emotional resonance. I began to consider the photographs of Black Maps as elegies for lost landscapes [...]. Viewed from the air, vestiges of the lake appear as diverse as a river of blood, a microchip, a bisected vein, or a galaxy's map. If death is the mother of beauty, as Wallace Stevens wrote, then The Lake Project images may serve as the lake's autopsy. It is this contemporary version of the sublime that I find most compelling."<sup>3</sup>

Whereas David Maisel documents the destruction of the Earth's skin through beautiful images taken from afar, the British sculptor Andy Goldsworthy takes this same skin as a starting point for his – often small-scale and temporal – interventions that require us to look closely. By using materials from the site and carefully rearranging them, Goldsworthy's work does not tell us about ecological cataclysms but about the silent, long-term and often subcutaneous changes that our cultivated landscape undergoes. According to Goldsworthy, "nature is intensely beautiful, and at the same time very unnerving, and at times deeply frightening. You feel it if you've ever stood in a wood that has been blown down after a strong wind, or through any incredible act of nature. You feel that as soon as you go out to the land, everywhere you go things are dead, decaying, fallen down, growing, alive. There's this incredible vigour and energy and life. And it's sometimes very difficult to deal with. I would hope that I don't have a kind of

*Opposite Sakura-Jima volcano, Kyushu, Japan*  
The enormous amounts of energy slumbering inside our planet burst to the surface at the edges of the continental plates and at the cracks in the earth's crust. This satellite radar photograph shows the relatively young Sakura-Jima volcano that erupted on a peninsula in the bay of Kagoshima and has been continually active since 1955.

romantic view of nature. I do feel the beauty of it, for sure. But it's a beauty that's underwritten by extreme feelings."<sup>4</sup>

Small scale or large scale, both Maisel's and Goldsworthy's works have the power to effectuate lasting changes in the way that we perceive our environment, and probably in our attitude to it. Interestingly, neither of the two will say that they worked towards this effect on the viewer. "It's not the intention of my work, but it does prime people towards environmental issues," Goldsworthy says. "I don't know how it does that, or why, but it does. I'm happy for that to happen. But if that became the intention of the work, then the work would be weakened."<sup>5</sup> Whereas Anne Wilkes Tucker writes about David Maisel: "While [he] abhors mankind's mismanagement of the environment, his driving interests are aesthetic and philosophical. A serious student of the ideas as well as the art works of Robert Smithson, Maisel, like Smithson, questions the process of perception and knowledge."<sup>6</sup>

<sup>2</sup> [http://www.davidmaisel.com/fine\\_bl\\_lake\\_info.asp](http://www.davidmaisel.com/fine_bl_lake_info.asp)

<sup>3</sup> [http://www.davidmaisel.com/infopages/inf\\_his.html](http://www.davidmaisel.com/infopages/inf_his.html)

<sup>4</sup> Quoted in an article by Oliver Lowenstein; <http://www.resurgence.org/resurgence/issues/lowenstein207.htm>

<sup>5</sup> <http://www.resurgence.org/resurgence/issues/lowenstein207.htm>

<sup>6</sup> [http://www.davidmaisel.com/fine\\_bl\\_term\\_info.asp](http://www.davidmaisel.com/fine_bl_term_info.asp)





PHOTO: GARY SCHNEIDER

## MATTER AND METAPHOR: THE HUMAN SKIN

In her book 'Skin. Surface, Substance + Design', Ellen Lupton writes: "Skin is a multilayered, multipurpose organ that shifts from thick to thin, tight to loose, lubricated to dry, across the landscape of the body. Skin, a knowledge-gathering device, responds to heat and cold, pleasure and pain. It lacks definitive boundaries, flowing continuously from the exposed surfaces of the body to its internal cavities. It is both living and dead, a self-repairing, self-replacing material whose exterior is senseless and inert while its inner layers are flush with nerves, glands, and capillaries."<sup>7</sup>

By area, skin is the largest organ in greatest part of the human body; it is responsible for our sense of touch, but also for other means of communication with the environment: "Skin can blush and blanch, get goose pimples and sweat, go blue with cold, red with anger, or metaphorically green with envy. Skin communicates in the form of pheromones, hormonal signals believed to be received by specialized cells in the nose."<sup>8</sup> Skin protects the human body precisely because its outermost layer consists of dead, compressed cells that are glued together with lipids into a water-repellent layer. Perhaps its single most fascinating property is its capacity of self-healing: if skin is damaged, scar collagen forms within the wound, and surviving epidermal cells migrate from the edges of a wound towards the centre to help heal it.

Skin's reaction to sunlight is ambiguous, and in this ambiguity it reflects man's mental attitude towards the sun, which has always been a mixture of attraction and fear. The colour of skin (i.e. its degree of 'darkness') depends on the amount and type of the pigment melanin in the skin, which is

determined by our genes, but also influenced by the level of UV radiation to which we are exposed. We all know the effects that this entails: after a few days of moderate exposure to the sun, we get a sun tan. Besides, anthropologist Nina Jablonski and George Chaplin have discovered that when human indigenous people have migrated to different latitudes, they have carried with them a sufficient gene pool so that within a thousand years the skin of their descendants has turned dark or white to adapt to the level of UV radiation they encountered there.<sup>9</sup>

Melanin has a twofold function besides determining our skin colour: it shields the lower parts of our skin from excessive UV radiation, which causes the skin to age more rapidly and even disrupts the synthesis of Vitamin B. On the other hand, ultraviolet light is essential for the production of vitamin D in our body, which in turn provides the means whereby we absorb calcium from our food in our digestive system.

Skin is also the canvas onto which each culture projects its own conceptions of beauty and sexual attraction. All of these are subject to change over time and also vary between different groups within a culture. In most contemporary western societies, a 'healthy' sun tan is considered attractive enough to cater for a whole industry of sun studios. In medieval Europe and in China, on the other hand, peasants and other outdoor workers had dark skin. The aristocracy therefore valued pale skin as an indicator of their wealth and often relied on lead or other poisonous ingredients in cosmetics "to create the lustrous white complexion seen in portraits from the sixteenth-century onward."<sup>10</sup>

Likewise, youthful, immaculate skin has

**Opposite Gary Schneider:  
John In Sixteen Parts, 1995**  
As in many of his portraits, Gary Schneider here deconstructs the human face. Although none of the photos shows the face in its entirety, the individual views combine to form an overall picture in the subconscious of the observer.

been a beauty ideal in societies since antiquity. It has been ceaselessly propagated by the cosmetics industry, and by advertising photography with its meticulous retouching of crinkles, spots, hair and pores. On the other hand, ever since the days of Leonardo da Vinci and Dürer (who are claimed to have been the first artists to paint realistic portraits of elderly persons) artists have been fascinated by what happens to skin when it ages, is damaged, or artificially altered.

In recent years, cosmetic surgery has even enabled us to speed up the adaptation processes that Jablonski and Chaplin discovered: within a matter of a few years, patients can be turned from 'black' to 'white' by entirely artificial means, as a prominent person from the pop world has shown. Tissue engineering, a discipline that aims at "the development of biological substitutes that restore, maintain, or improve tissue function or a whole organ",<sup>11</sup> is considered a field of major economic growth in the medical sector.

<sup>7</sup> Ellen Lupton (ed.): *Skin. Surface, Substance + Design*. Smithsonian Institution / Princeton Architectural Press 2002, p. 23

<sup>8</sup> Jennifer Tobias in: Ellen Lupton (ed.): *Skin. Surface, Substance + Design*, p. 44

<sup>9</sup> [www.bgsu.edu/departments/chem/faculty/leontis/chem447/PDF\\_files/Jablonski\\_skin\\_color\\_2000.pdf](http://www.bgsu.edu/departments/chem/faculty/leontis/chem447/PDF_files/Jablonski_skin_color_2000.pdf)

<sup>10</sup> [http://en.wikipedia.org/wiki/Semiotics\\_of\\_Ideal\\_Beauty](http://en.wikipedia.org/wiki/Semiotics_of_Ideal_Beauty)

<sup>11</sup> Langer, R & Vacanti JP, *Tissue engineering*. Science 260, 920-6; 1993

*Below Corpo Nove / Grado Zero Espace / Mauro Taliani: Oricolco, 2001*

For this particular shirt, a titanium alloy weave was developed that assumes a predetermined shape when the temperature changes. As a result, the shirt can be programmed in advance to roll up its sleeves automatically at a certain temperature.



PHOTO: GRADO ZERO ESPACE

## MAN-MADE SKINS AND 'INTELLIGENT' MATERIALS

The influence of human skin and other natural skins on technology, design and architecture is manifold, ranging from its erotic appeal, its flexibility and its warm, soft touch to its abilities to adapt to temperature and lighting levels. Ellen Lupton writes: "Contemporary designers approach the surfaces of products and buildings as similarly complex, ambiguous forms. Manufactured skins are richly responsive substances that modulate the meaning, function and dimension of things."<sup>12</sup> Even the self-healing properties of skin have, to a certain degree, already been adopted in modern technology, such as automobile lacquers that can 'heal' small scratches due to their viscous, rather than solid, consistency. Another example is self-healing skins for pneumatic structures, whose inside is coated with a thin layer of polyurethane foam. When the membrane is punctured, the air pressure inside the pneumatic chamber forces the PU foam into the gap, thus closing it. This mechanism, which was derived from a similar process in the cell tissue of lianas, provides nearly 100% airtightness for leakages up to 5 mm in diameter.

Clothing and buildings have often been called the second and third 'skins' of mankind, whose task it is to protect the human body. Ideally, they should therefore possess similar capacities of adaptation as our skin. One way to achieve this task is the development of 'intelligent' materials, which can reversibly change their properties when they are exposed to certain influences like heat, light, pressure, electrical or magnetic fields, or changes in the chemical composition of their surroundings. For example, Italian textile engineers have developed a fabric made of a shape memory alloy (SMA) which causes shirt sleeves to automatically roll up at a certain temperature. Peltier elements can be integrated into clothing to provide active cooling when an electric current is applied to them. The American 'No Contact' jacket fends off potential attackers by producing a tension of some 80,000 volts on its surface when a button is pressed.<sup>13</sup>

Smart technology also has its more poetic sides, though: The 'F+R Hugs' T-shirts, developed by the Cute Circuit company from Italy, come in pairs and communicate amongst them via bluetooth technology. When a person touches his or her T-shirt in a certain place, integrated power circuits in the partner's shirt will produce a similar movement or 'hug' in the same place.

In architecture, as in fashion design, the 'skin' analogy touches upon two aspects: the aesthetic and the functional. In a book about the German engineer Werner Sobek, Werner Blaser compares the inhabitant of a traditional building to a hermit crab that changes its dwelling whenever it has become too small or too large, or otherwise inadequate. Blaser then asks: "But is it right to use such unchanging methods of building construction in a world that itself is constantly changing? [...] the physical properties of our buildings remain constant, although internal and external environments permanently impose changes on them."<sup>14</sup> Blaser's book was published in 1999, and there has been considerable development in building technology since then. Nonetheless, the visionary concept of an ideal building skin that Sobek developed in the '90s is still relevant today. Rather than considering the building's skin as one multi-functional 'all-rounder', Werner Sobek suggested that, very much like human skin, it should be made up of highly specialised, mono-functional 'cells' that perform different tasks, such as light transmission, energy absorption or ventilation. Depending on budget and availability, the cells could be produced on different levels of technical sophistication, ranging from mechanically or electromechanically operated elements to those that function on a chemical and micro-biological level. According to Werner Sobek, "adaptive systems and mechanisms will be a natural part of our daily life in a few years. Automatic, self-learning distance controls for automobiles are already available today. Adaptive cardiac pacemakers, which do not work at a constant frequency but react to external physiological

influences like movement, are under development, as are active prostheses and implants with sensory functions and actuators [...] In the building trade, adaptive systems for noise reduction and glasses with variable light transmission will be as common as the active manipulation of forces, deformations and vibrations, especially in light-weight load-bearing structures."

In 2004, Werner Sobek and his assistant Markus Holzbach from the ILEK institute at Stuttgart University constructed the experimental pavilion 'Paul' to demonstrate the potential of adaptive materials in buildings. 'Paul' is a cocoon-like, light-weight structure with a skin made up of various layers of membranes. These transmit daylight as well as emitting artificial (LED) light, provide thermal insulation through an innovative ceramic material, and store the heat from the sun's rays in a phase change material (phase change materials are micro-encapsulated paraffins that use excess heat to turn from solid to liquid, so they can store the heat energy without changing their temperature). Paul's skin is only 1.4 centimetres thick, but equivalent to the thermal mass of a 15 centimetre, massive wall. That said, Paul's construction is rather low-tech, the segments of its skin being linked only by velcro tape and thus capable of being mounted or dismantled manually.<sup>15</sup>

<sup>12</sup> Ellen Lupton (ed.): *Skin. Surface, Substance + Design*, p. 23

<sup>13</sup> Axel Ritter: *Smart Materials*. Birkhäuser Verlag 2007, p. 16-19

<sup>14</sup> Werner Blaser: *Werner Sobek. Art of Engineering*. Birkhäuser Verlag 1999, p. 50

<sup>15</sup> [http://www.tec21.ch/pdf/tec21\\_4120052942.pdf](http://www.tec21.ch/pdf/tec21_4120052942.pdf)

## ADOLF LOOS VS. ANGELINA JOLIE: PURITY AND ORNAMENT IN HUMAN CIVILISATION

Most architects will know Adolf Loos' contempt for ornament, which he describes as a sign of degeneration and immorality in his essay 'Ornament and crime' from 1908. One of the examples that Loos uses to illustrate his point is the heavy tattooing of native people, whom Loos considers not to have evolved to the same levels of morals and civilisation as modern man. Loos wrote: "The modern man who tattoos himself is a criminal or a degenerate," and attributed similar values to heavily ornamented architecture. 99 years later, this attitude has obviously changed: "These days the tattoo sits firmly in (or on) the bosom of hip celebrity culture, sported by the likes of Angelina Jolie, Gwyneth Paltrow and supermodel Linda Evangelista," wrote Pernilla Holmes in an exhibition review on tattoo art in 2001.<sup>16</sup> She continues, "What's more, the tattoo remains a defiantly individualist brand in the face of global mass consumerism." The same can be said of contemporary architecture, into which ornament has returned with vigour. This can be attributed, amongst others, to two phenomena. Firstly, there is the development of new manufacturing processes that allow the economic production of ornamented surfaces in 'lot size one' (an indispensable criterion if surfaces are to constitute a 'defiantly individualist brand'). And secondly, the tendency towards ornament has to do with a new permeability of boundaries between architecture and other fields of art.

As a counter-strategy to ornament, Adolf Loos stressed the aesthetics of pure materials such as the warm grain of wood or natural stone and the lustre of metal that slowly and graciously covers itself with a layer of patina. A similar movement, which in many ways persisted to this day,

started in the late '80s, when architects began to oppose the semantic extremes of both deconstructivism and Post-Modernism. Whereas these had almost entirely been obsessed by form, a new generation of architects – especially Swiss – started to be concerned about materials and their interaction with the site and its specific daylight situations. As Andreas Ruby pointed out, this new materialism, later termed 'minimalist', was firmly rooted in the Calvinist tradition of Switzerland. It invested labour and money into the ostentatious 'non-show' of ornament and detail rather than into the ostentatious display of wealth. Interestingly, a distinctly puristic, sensual variation of minimalism became the common 'corporate architecture' of most luxury brands from Armani to Prada from the mid-'90s onwards. The companies' desire for understatement and a museum-like atmosphere to present their goods are two reasons for this development. Another driving force was the fact that the fashion industry, which had by then had already evolved into a 'beauty industry', offering cosmetics and accessories, had become obsessed with the purity even of its architectural skins. In his essay 'An Alabaster skin' from 1993, Dutch architect Wiel Arets pondered over this intricate relationship between purity and reality, which he considered analogous to the duality of architectural 'ideas' (i.e. designs) and built objects: "Architecture may be considered a desire for purity, a striving for perfection. The principal colour white marks a process in which the undecidable is respected: it is not a question of meaningful or meaningless. The whiteness of newly fallen snow in the morning light, the white of a perfect

*Opposite SANAA: Dior Omotesando, Tokyo, 2003*  
The Dior flagship store created by SANAA is an icon of the sensual minimalism with which many fashion and cosmetics manufacturers have been surrounding themselves since the 1990s. The creamily floating facade consists of a glass shell and an inner acrylic facade layer reminiscent of the folds of a robe.

PHOTO: SHINENCHIKU.SHA

skin, the white of paper on which the design will be sketched – white is everywhere and may be considered the colour of origin and beginning [...] Architecture is unblemished. Its entire logic risks something that is of only short duration. It appears only to disappear. [...] It presents us briefly with freshness and untaintedness, only to lose those properties precisely by offering them to us. Architecture is therefore a between, a membrane, an alabaster skin, at once opaque and transparent, meaningful and meaningless, real and unreal. To become itself, architecture must lose its innocence; it must accept a violent transgression. It can only become part of the world by entering into marriage with its surroundings."

<sup>16</sup> <http://www.artnet.com/magazine/reviews/holmes/holmes7-23-01.asp>





PHOTO: NOX

## SEEING AND RE-SEEING: A FEW REFLECTIONS ON PROJECTIONS

When the brothers Lumière showed one of their first-ever motion pictures in Paris in 1895 – a post train entering a station – the viewers reacted to this new experience as they would have done in real life: as the train approached the camera, they receded from the projection screen and, in some cases, even fled from the room. (In those days, movies were mostly shown in cafés or restaurants). Today, it would be hard, if not impossible, for any motion picture to produce similar reflexes in the audience. People have learnt to 'cope with' the medium of film, as they have done with virtually every medium they have been offered in the past.

Without doubt, however, moving images have altered visual perception in the 20th century. French philosopher Paul Virilio claims that even the notion of 'transparency' has changed<sup>17</sup>: from showing what is behind a surface to showing what the graphic designer or the film director and his cameramen want us to see. Just consider a TV image: everybody knows it consists of closely juxtaposed dots of red, green and blue light on a plane of glass but when we watch TV, we do not focus on this fact, nor on the fact that it is a pane of glass that we are looking at.

In his books 'The Lost Dimension' and 'The Vision Machine' from the early 1990s, Paul Virilio complains that mankind has lost its traditional immediacy of vision or, in other words: its perception of the material reality of things, to a mediated reality that follows a cinematic logic. According to Virilio, we are no longer 'see-ers', but 'resee-ers', who only perceive what the 'eye' of the camera or the animation artist has seen before them. In the case of modern 'vision machines', the flow of natural light has been replaced by a flow

of electrons, and in computer graphics, even the direction of seeing is reversed: rather than on the rays of light emitted by sources of light, 'ray-traced' images are based on (virtual) 'rays of sight' that start from the eye and are reflected, diffracted or absorbed by different surfaces. More than two thousand years ago, Aristotle tried to explain human eyesight with a similar (but later discarded) model, according to which the eye emits minute rays of light that light up the surroundings and thus allow us to see.

In contemporary urban environments, our eye has little opportunity to contemplate things any more. Rather, it is constantly being 'caught' by images, colours, and rapid movements. One symptom of this 'race for attention' was the emergence of media facades and the proliferation of video screens in architectural space. Operating according to the principle of 'big images, little words, great effects'<sup>18</sup>, these surfaces appeal to our innate orientation reflex, a mechanism for survival that immediately makes us turn our attention to any object in our field of sight that is large or otherwise conspicuous and moves. Video screens and media facades are, so far, the last step in a progressive debonding of buildings' skins from their content that has taken place in the last few years. With their dynamic of changing lights and moving images, they have added a new level of complexity to our buildings, and provided architects with new means to create atmosphere and meaningful interaction with the user – but also to further enhance the 'information overload' that is omnipresent in our environment.

Lars Spuybroek's illuminated 'D-Tower' in Doetinchem/Netherlands, whose colour changes according to the 'moods' and feel-

**Opposite NOX / Q.S. Serafijn:**  
**D-tower, Doetinchem, 2004**  
This large sculpture changes its colour to match the emotions of the inhabitants, determined from an Internet survey. Its creator, Lars Spuybroek, describes the tower as a "reversal of the path to abstraction": a concrete object representing a virtual public space that is very difficult to grasp.

ings of the town's inhabitants (who, in turn, are assessed via a website), is an example of a playful dialogue between buildings and the public. Unlike traditional media facades, the tower and similar installation do not fulfil any 'functions' or tell us any 'stories' other than the ones we tell them. More than anything they are experimental set-ups that explore how new communication channels are appropriated by the public.

In most cases, however, the simple experience of a new medium will attract attention mainly while the medium is new. Ultimately, the quality of the content and the design, as well as its potential to enhance the quality of our lives, becomes more important. The notion of quality, regarding content, has little to do with 'high' or 'low' cultures in this case; more than anything it has to be compatible with the expectations of the user and the possibilities that the medium offers.

<sup>17</sup> Paul Virilio: *Sehen, ohne zu sehen*. Benteli Verlag Bern 1991

<sup>18</sup> Wolfgang Lanzberger: *Medien zwischen-Himmel und Erde*; see [http://regisseur.wolfgang-lanzberger.de/filmografie/pub\\_mediafassade.html](http://regisseur.wolfgang-lanzberger.de/filmografie/pub_mediafassade.html)



## AVAILABILITY AND RESPONSIBILITY

In the preceding paragraphs, surfaces and skins have been discussed under a twofold aspect: as communication interfaces and as physical boundaries. Two lessons can be learnt from the examples quoted above.

Firstly, surfaces do not necessarily indicate underlying structures, or the physical properties of objects, any more. Pollution may seem beautiful when seen from afar, black skin may be turned to white, things with a hard look may turn out to be soft, and what looks like a solid masonry wall may in fact be only a centimetre-thick cladding on the building's surface.

Secondly, using science and technology we have put ourselves in a situation where we can change the earth's 'skins' radically to make them coincide with our ideas, rather than adapt our ideas to the phenomena we observe, as Galileo's contemporaries had to. The responsibility that this imposes on us is obvious. Only critical awareness will allow us to distinguish 'real' innovation from mere superficial and cosmetic changes, and to put this innovation to use in a beneficial way. False myths and fraudulent storytelling are ubiquitous in our material world, including architecture. The great Danish novelist Hans Christian Andersen knew this when he wrote his probably best-known fairytale, 'The Emperor's New Clothes'. The real clue of this story is not merely that the two traitors pretend to be weaving the most beautiful and exquisite clothes for the emperor, but that they pretend that only those lacking in intelligence would be unable to see them. In the end, it is a child that blurts out the truth: "But the Emperor has nothing at all on!"

Sometimes, insight may be gained by very simple observations – even in a time of seemingly omnipotent technology. And

it may be helpful at times to ask some very simple question with the same, childlike scepticism and stubbornness: Do we want to spend large amounts of energy on making our (second and third) 'skins' adaptive and attractive? Or cannot the same be achieved by astonishingly simple means in the same way? What use is the beautifully designed coachwork of a car, or a shiny glass facade, if the machinery behind it wastes too much, or runs on the wrong fuel? And what happens to these skins when they are shed? Will they end up on rubbish dumps or become part of a 'cradle to cradle' system where everything is recycled or reused, and nothing is lost?

We may not get simple answers to these questions in our highly complex world; they will most often be of the "well, yes – and no" kind. But these questions may help us remain true to the principles we once drew up. Because as the American architect James Wines writes: "The twenty-first century age of ecology is a critical point of transition and connection. It has arrived for some architects like a plague on the conscience, threatening their entrenched beliefs, stylistic preferences, and habitual work methods. For others, it has become the revolutionary and resource-saving opportunity to develop a new technology. For more contemplative architects, it has been seen as the beginning of a deeper awareness of the earth and a cause for re-thinking the foundations of architecture by blending art, philosophy, technology, and nature's integrated systems. While this third group is potentially the most productive, the challenges it faces are daunting. It means confronting, questioning, and probably having to ultimately embrace concepts that endanger the institutional frameworks of religion, economy,

and politics; not to mention most things the building arts have been about since the advent of the industrial revolution."<sup>19</sup>

While this clearly defines the challenges that lie ahead of all of us, James Wines also identifies the pitfalls of the new 'brave green world': "... the terms 'green' and 'sustainable' have become so ubiquitous and generic that, whatever potency or legitimacy they once had a few decades ago, can now be deemed what writer and editor, Cathy Ho, has identified as 'green wash.' It appears that everyone [...] has embraced the green mantra as evidence of their social concern and political correctness. [...] Green has become the new Good Housekeeping seal of approval - assigned to virtually everything from building materials to cereal packaging, from toilet paper to condom wrappers."<sup>20</sup> James Wines' call for a new scepticism towards environmental issues may seem radical to some. However, given the changes in the last few years, it may hardly come as a surprise. A constant, critical assessment of what is beneath the 'skins' of our material world is maybe what is needed most in our days.

<sup>19</sup> James Wines: *Green Architecture*. Taschen Verlag, 2000

<sup>20</sup> James Wines in: *[ark] magazine* 2-2007, Feb 2007

## INTERVIEWS

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# 01 Roberto Casati

**Roberto Casati** is a senior researcher at the National Center for Scientific Research (CNRS) in Paris, and is a visiting professor at the IUAV University in Venice. He has published with A. Varzi of Columbia University *Holes and Other Superficialities* (MIT Press,

1994) and *Parts and Places* (MIT Press, 1999). His book *The Shadow Club* has been translated into seven languages and awarded various prizes (Premio Fiesole, Premio Castiglione and Prix de La Science Se Livre). [www.shadowes.org](http://www.shadowes.org)

Mr. Casati, what did the culture you grew up in and your education teach you about light?

In Italy, where I was born and grew up, people often have to protect themselves from the light rather than go out and find it. The windows in the thick house walls are usually fairly small and almost always have some form of protection from the light, like light roller blinds or curtains. Light is seen there more as a problem than as a resource. In the countries north of the Alps, the opposite is the case. In Paris, I live in a building that is symbolic of light and brightness: Le gratte ciel n° 1, the first skyscraper built in France by Edouard Albert. Its distinguishing features are its large glass fronts, light-looking wall structures and windows that open outwards. Despite this, I live down at the bottom on the second storey facing north-west and one of my rooms doesn't have any windows at all (as the skyscraper is at the bottom of the Bièvre valley, the lower floors at the back don't have windows). This might sound like an oxymoron, but on the other hand it definitely stems from my cisalpine and transalpine 'double life'.

I find that this geographical and cultural divide is also reflected in environmental policies and the differences in building design between the north and south of Europe. One of the most interesting research projects of the future for architects will certainly be the valorisation of light in the southern latitudes and how it can be used artistically and economically – in short, how to see light as a resource rather than a problem.

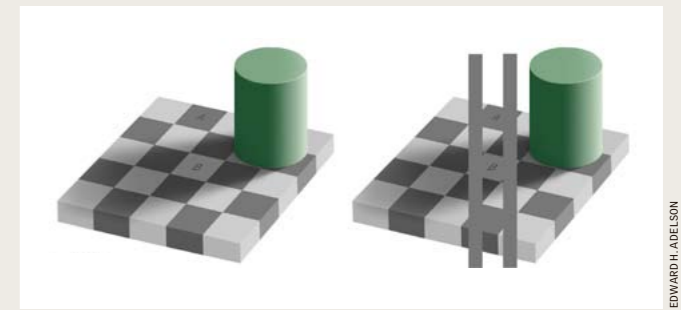
What properties of light have you discovered yourself that fascinate you?

An important aspect of my research concerns the informative properties of light. Unlike certain basic features that arise from the interaction between light and matter, these are higher properties that are dependent on the presence of various objects in the environment and on how these objects reflect the light and consequently create different and multi-faceted patterns. In my most recent study, shadows play an important part within these informative structures. The contrasts between light and shadows are a very simple kind of information (on/off) and allow us to visually perceive a three-dimensional space and the arrangement of the objects in it.

In order to reconstruct the world we perceive, our eyes primarily use the information that appears at the borders between separate surfaces. This preference for the borders has one decisive advantage: because the light in an environment is never distributed evenly, but is almost always graded, if vision samples the light further away from the borders between surfaces, we receive information that is less about these surfaces and much more – and indeed primarily – about the surrounding light. As an example, the middle of a piece of white paper that is a considerable distance from a light source can reflect less light than the middle of a piece of black paper close to the light. However at the borders between the white and black paper, the surrounding light is distributed relatively evenly and allows a reliable (not absolute but relative) comparison of the surfaces.

In the illustration by Adelson (opposite), the squares A and B reflect exactly the same amount of light. However, our visual system is able to discount the intensity of the shadow cast by the cylinder and to adapt the colour of squares A and B to the rest of the chequered pattern.

Shadows complicate our perception, because our vision has to learn to differentiate between a border caused by light (a shadow) and a border that is independent of light (between a piece of white and a piece of black paper). If this were not possible, we would perceive shadows as permanent characteristics of an object. This occurs, though rarely, when the light border coincides



EDWARD H. ADELSON

You have devoted a large part of your research to the misconceptions and deceptions that human perception is subject to. In your experience, are there any of our five senses that are more easily deceived than others?

In your book *The Shadow Club*, you write about the hypothesis that children seem to have an innate concept of what an object is, but not of what a shadow (or a projection) is. What do you consider to be the reasons for this difference?

Mankind has taken a long time to understand the nature of shadows, and for a long time shadows were associated with popular myths and spiritual beliefs. What remains of these myths today?

with a dividing line that is independent of the light. In this case, our perceptual system is confused. This is why Leonardo advised other painters not to draw a line around a shadow's contour.

Research into perceptual illusions (as demonstrated above by the Adelson image) is an important part of the psychological study of perception. I do not believe that there is an order of precedence for the senses. Although philosophers have, for a long time, been of the opinion that the sense of touch is the most reliable, there are also tactile illusions matching visual ones. More recently, even the classification of the senses has been questioned. There are no reliable criteria for the exact definition of a 'sense'. We do not know whether bats 'hear shapes' or 'see with their ears'. Differentiation between the senses depends on our commonsense understanding, but this certainly cannot be a scientifically based differentiation.

Elizabeth Spelke of Harvard, who made the most interesting findings about infants' concepts of an object, developed a resourceful method of understanding how children see and perceive the material world (which they are unable to verbalise because of their age). When confronted with certain situations, children are surprised, and this surprise is interpreted as an indication of the fact that every child has precise expectations. The perception of shadows is an interesting case, because shadows (in contrast to dreams, for example) are physically real, but are still immaterial (they are 'made of nothing'). The reason why we do not have an inherent understanding of what a shadow is, despite its strong perceptual salience, is possibly that the number of innate concepts available to every one of us is relatively limited, and that the notion of a shadow is, to a certain extent, derived from our concept of an object. It is certainly true that small children (under the age of one year) treat shadows like objects and are unable to perceive that they are projections or phenomena of light. Unlike adults, for example, they are surprised when a shadow moves when the object that casts the shadow is moved.

Most myths are anchored securely in the images and symbols of human thought. That is why great value is always attached to them, although they have a transient nature and vary slightly from one culture to another. Shadows are often a metaphorical source of myths related to the soul: like the soul, our shadows are dependent on our bodies (but not completely, since we are not, after all, able to separate ourselves from our shadows). A shadow is immaterial and looks like the person who casts it, and so on and so forth. As long as this idea feeds our imagination, it will always be possible to generate myths about shadows or understand such myths as they are expressed in other cultures.

# 02 David Maisel

**David Maisel** was born in New York City in 1961. He received his BA from Princeton University, and his MFA from California College of the Arts, in addition to studying at the Graduate School of Design at Harvard University. Maisel's work is represented in the permanent collections of the Metropolitan Museum of Art, the

Los Angeles County Museum of Art, the Brooklyn Museum of Art and others. His monograph *The Lake Project* (Nazraeli Press, 2004), was selected as one of the Top 25 Photography Books of 2004 by the critic Vince Alletti. His second monograph, *Oblivion*, was released by Nazraeli Press in 2006. [www.davidmaisel.com](http://www.davidmaisel.com)

Mr. Maisel, what did the culture that you have grown up in, as well as your education, teach you about the earth and its surfaces?

In 1983, as an undergraduate student at Princeton University, I accompanied my professor of photography, Emmet Gowin, on a photographic expedition to the volcano Mount Saint Helens. The eruption of St. Helens was the deadliest and most destructive volcanic event in the history of the United States. It released energy equivalent to the 27,000-ton atomic blast over Hiroshima. What captivated me at St. Helens was not only the natural disaster of the volcano, but the equally potent and cataclysmic energy with which the logging industry was clearcutting the area. I was an east-coast kid, raised in the suburbs of New York, and I found the biblical scale of this man-made destruction really chilling and compelling, especially when seen from the air. This sense of the apocalyptic sublime set the course for my future work.

My work since that time has been comprised, at least in part, of an ongoing project of aerial photographs of environmentally impacted landscapes, a body of work collectively titled Black Maps. The images from Black Maps have as their subject matter the undoing of the natural world by the wide-scale intervention of human efforts in the landscape, culture and nature merged in a kind of dizzying entropic descent. Indeed, looking down from an aerial perspective onto these damaged sites, where human activity has replaced the natural order, the views that I see are simultaneously beautiful and horrifying. My images are meant neither to vilify nor glorify their content, but rather to expand our notions of what constitutes landscape or a representation of landscape in this, the era of the post-natural world.

What did your own experience teach you about the earth's surface?

What have you found out that earth can tell us, which you had not known or seen before?

My investigation of environmentally impacted sites led me to begin *The Mining Project*, my series of aerial images of strip mines throughout the United States. With the aerial views of these mining sites, I found a subject matter and a way of seeing that carried forth my fascination with the undoing of the landscape, in terms of both its formal beauty and its environmental politics. Witnessing the scarring and transformation of the earth's surface from above led me to believe that such deconstructed landscapes of strip mines, cyanide leaching fields, and tailing ponds were, in fact, the contemplative gardens of our time; they felt like subterranean dream worlds demanding to be brought into the light of day. I began to consider my pictures not simply as documents of these blighted sites, but as poetic renderings that might somehow reflect back the human psyche that made them.

Photographing from the air interested me not as a method per se but as a way of seeing the otherwise unseeable and unimaginable, and as a way in which time and space could get strung together. As a photographer working from the air, I am never in the same place twice – thus no image can be repeated. The light is constantly changing as well: as I circle in the plane above my subject, my position relative to the sun is variable. The colours and forms that reveal themselves actually shift from one frame to the next. So the work to be done as a photographer in such a situation is one where a kind of heightened awareness is necessary, in order to respond to everything (form, colour, texture, etc) being in a state of flux. The experience is a stream of images and possible framings that is not unlike the stream of consciousness itself. Through the aerial photographic process, motion gets dissected and reanimated.

In our lifetimes, the technologies with which to image have changed radically many times over. NASA images of the moon, or of the surface of Mars that were first so rare and mysterious, are now downloadable on our laptops.

Your 'Black Maps' and 'Lake Project' photographs show a somewhat disturbing and deceptive aesthetic. What looks beautiful at first glance turns out to be horrid and dangerous when one looks closer. Do you see analogies to this in our everyday lives and patterns of consumption?

We can instantly access detailed satellite images of our own planet, from views of the war in Iraq to Google Earth images of our own homes. The aerial view has become part of the visual language we speak.

The satellite view and the aerial view are instances where photography is a process of mapping, and of rendering surfaces, and also an act of selective surveillance. Satellite imaging and topographical maps have always been a source of inspiration for me. But the map by necessity differs from that which is being mapped. It is a parallel reality. The photographer Garry Winogrand said "the photograph isn't what was photographed; it's something else, a new fact." The photograph examines not reality, but existence. In a way, photographs are like creation myths, attempts to make sense of the world.

The themes of seduction and betrayal inform my thinking and my work in a number of ways, particularly in *The Lake Project*. We're constantly seduced in our daily lives by whatever it is that is new and shiny, the next consumer object to be desired – the SUV, the iPod, the widescreen TV. And I think we're betrayed by these desires, and these objects, because they don't really satisfy us existentially, they just create more longing. Simultaneously, we betray the environment as we thresh through it and use it up in a vacant effort to fill those endless longings that cannot be quelled.

My images sort of replicate that process. They are gorgeous and seductive, beautiful and engaging. And then, if one penetrates the surface beauty of these pictures, to find out that what is being imaged is in fact an abject, toxic site, one that has been kind of forsaken in a way, then there's a kind of betrayal built in to the process. But we as a society are complicit in the destruction of these zones. The seduction yields the betrayal.

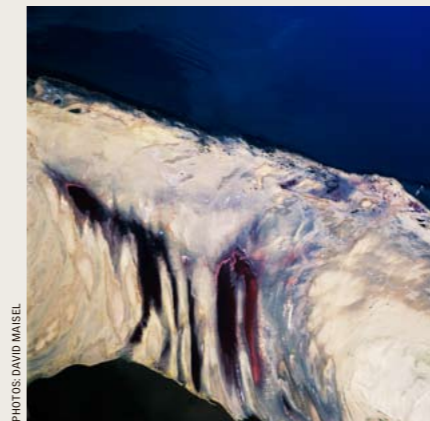
So there is also a twinned process of seduction and betrayal involved – a viewer might be seduced by the colours and forms of these images, and then, in a sense, betrayed once knowledge of the subject becomes clear. It parallels the way we are seduced, and ultimately betrayed, by a certain level of consumerism that exacts such tolls on the environment. Yes, I want my SUV and my wide-screen TV and... oops! There goes the ozone layer! Imagine that!

As a bit of background: Owens Lake, the subject of *The Lake Project*, is the site of a former 150-square mile lake on the eastern side of the Sierra Mountains. Beginning in 1913, the Owens River was diverted into the Owens Valley Aqueduct to bring water to the fledgling desert city of Los Angeles. By 1926, the lake was essentially depleted, leaving vast exposed mineral deposits and salt flats. Once the water was gone, high winds sweeping through the valley dislodged microscopic particles from the dry lakebed, creating carcinogenic dust storms. In fact, the lakebed became the highest source of particulate matter pollution in the United States, emitting 300,000 tons of arsenic, cadmium, chromium, chlorine, sulphur, and other materials annually. The concentration of minerals in what little water remains in Owens Lake is so artificially high that blooms of microscopic bacterial organisms result, staining the remaining water a deep, bloody red.

While I was engaged with this project in 2001, the EPA and the Los Angeles Department of Water and Power, urged on by the Great Basin Unified Air Pollution Control District, began transforming the region yet again. In an effort to reduce the toxic dust storms, a large area of the lakebed has been turned into the Flood Zone. It is infinitely complex, like the Lost City of Atlantis rising from the floor of the lakebed. In fact, after I'd completed this project, I got down onto the surface of the lakebed and was able to gain access to the control room centre that maintains and measures the salinity and relative moisture from the 60,000 miles of irrigation drip tubing that crisscrosses the flood zone. There, on their computer screens, were these familiar shapes of the flood zone that they image with remote aerial photography and satellite mapping.

Everything in the sites that I photograph is mediated – they are nearly replicant landscapes. Thus photographs in *The Lake Project* are concerned with a specific site – that of Owens Lake – but they are also as much about ambiguous new geographies of the psyche, primordial backdrops to violence and desolation, that come into being from such damaged sites. I don't want to ascribe a fixed meaning to these images. The images remain metaphors for an entropic descent into post-modern space and time.

In *Terminal Mirage*, a body of work inspired by Robert Smithson's writings on the Great Salt Lake, I've sought out gridded sites around the periphery of the lake – among the thousands of acres of evaporation ponds, amidst the mil-



PHOTOS: DAVID MAISEL

Faced with destruction and pollution, how do we as human beings react in your experience? Do most of us take the viewpoint of the aerial photographer – move away from where things 'hurt' to where they merely look beautiful?

**Preceding double-page:**  
**David Maisel: The Lake Project**  
9823-4, 2002  
**David Maisel: Terminal Mirage**  
206-7, 2003

**Opposite:**  
**David Maisel: The Lake Project**  
9802-1, 2002  
For David Maisel, the seductive but deceptive beauty of his aerial photos is a metaphor for the attitude of people towards nature: "Our contemporary society is seduced into believing that how we live does not matter."

itary zone of the Tooele Army Depot that houses and burns expired chemical weapons. There is no scale reference in the images, and the 'facts' of the photographs become instead a series of dizzying tropes. Terminal Mirage is also concerned with the limits of rational mapping. The grids of evaporation ponds are a kind of transgressive architecture, a labyrinth laid endlessly over the surface of the lake and its shoreline. The project Terminal Mirage gets its name from the fact that the Great Salt Lake is, indeed, a terminal lake, with no natural outlets. The claustrophobic, no-exit, existentialist aspect of this fact sparked my curiosity. And the word mirage seems to describe the entire hallucinatory quality of the expanse of the Great Salt Lake, the unflinching light that illuminates it and that is reflected from its surface, and the manner in which this body of work questions the nature of sight and perception.

Faced with destruction of our Earth by our hands, the hands of civilisation and industrial progress, most viewers of my work are alternately mystified, repelled, and alarmed. Whether they take my images as a call to action I cannot say. I'm not certain the images are intended to function that directly. I'm motivated by the notion of discovering and revealing sites that might otherwise remain unknown or unseen – be they clearcut logging sites, strip mines, cyanide leaching fields, etc. My photographs of these sites are intended to be reflective of some sort of internal, psychological state as much as they are documents of a particular site. And, I consider myself a visual artist first and foremost – as opposed, perhaps, to a photojournalist or a documentarian. I'm most interested in making images that have a kind of depth-charge, that have a certain poetic or metaphoric impact visually.

Art does have every need to address the political, and there is also absolutely an intended political charge to my pictures. (I don't know that one can spend several decades photographing sites of environmental degradation without feeling at least somewhat politicised by the process!) But in my work, I'm not interested in pointing fingers or laying blame. I feel that we as a society, collectively, have made these places. It isn't as simple as condemning this or that corporation, for example. My images are ultimately not documentary images, they are not pure in that respect. They are theoretical, not cartographic; they are more interested in exploring the unconscious than the objective. They have my thumbprint all over them. They are, in a sense, meditations.

It's the overlapping realms of ethics and aesthetics that occupies my interest. So, there is a kind of 'aesthetic activism' or 'subliminal activism' involved, I suppose.

Which provides a nice segue into your question about beauty. I don't view the condition of beauty as being 'merely beautiful.' Beauty has been seen as problematic for the visual arts in general because we no longer trust beauty as a serious means of investigation. But it can be. Beauty wedges into artistic space a structure for continuously imagining what we do not yet know or understand. For an object or an image to possess beauty does not mean that it is empty of meaning or shallow. In fact, beauty can be incendiary. It can be subversive. It can make us cringe.

The kind of beauty that interests me most is one that possesses an element of terror – an awful beauty, beauty not as a salve, but as a weapon of sorts. It is an update, perhaps, of the nineteenth century notions of the sublime, which seems to have something relevant to say at our point in history right now. In his essay 'Notes on Beauty,' the critic Peter Schjeldahl writes "Nothing in itself, beauty may be a mental solvent that dissolves something else, melting it into radiance."



# 03 A.S. Raghavendra

**Professor Agepati S. Raghavendra** obtained his Ph.D. from Sri Venkateswara University, Tirupati, India in 1975. He was Associate Professor at the Department of Plant Sciences, University of Hyderabad from 1985, rose to the position of Professor in 1996 and has been the Dean of the School of Life Sciences at the Univer-

sity of Hyderabad since 2004. Prof. Raghavendra is Vice-President at the A.P. Akademi of Sciences and Editor-in-Chief of Journal of Plant Biology. His book *Photosynthesis: A Comprehensive Treatise* was published by The Cambridge University Press. [www.uohyd.ernet.in/sls/dplants/plantsciences.htm](http://www.uohyd.ernet.in/sls/dplants/plantsciences.htm)

Professor Raghavendra, what did the culture that you have grown up in, as well as your education, teach you about light?

In my opinion, light is always stimulating and instils vigour and enthusiasm. Bright days make humans active, alert and confident. Although there is no scientific explanation, the light of early morning enhances the alertness and receptive functioning of the brain. To the naked eye, the light at sunset and sunrise is quite pleasant. The positive effect of light, particularly during the early morning, is seen on not only humans but also on plants. Some of the photomorphogenic and biochemical mechanisms in plants are triggered just before sunrise.

How did this understanding of light change in the course of your career? What properties of light have you discovered yourself that fascinate you?

During my childhood, I only knew that the daylight is refreshing. As I grew up and got involved in studies on photosynthesis, I could appreciate the properties of sunlight in relation to plant function. Visible light, as we 'see' it, is mostly in the region of 400 to 700 nm. However, light from sun also contains a significant portion of ultra-violet (<400 nm) and infra-red regions (>700 nm). Plants see (perceive) light mainly because of two major pigments. The first one is chlorophyll, the green pigment that most of us are well aware of. The second one is phytochrome, which is not visible to the naked eye but is responsible for most of the photomorphogenic effects, such as phototropism, flowering, seed germination and so on. It is quite fascinating to study the mechanisms by which the plants perceive light and transmit the signal. I was personally involved in understanding how the signal of light is perceived and transmitted deep into the tissue. This phenomenon of transduction of light signal is quite interesting as the parts of plants that do not really see light can still respond. It is also common knowledge that plants adapt to the availability of light by making adjustments to the quantity and distribution of chlorophyll, the green pigment. For example, plants that grow under intense light usually have leaves that are thin, small and light green in colour. In contrast, plants grown under low light or in shade have leaves that are thick, big and dark green.

As a researcher in photosynthesis, what do you consider the most promising solutions for the earth's energy supply for the future? How are they linked to the sun as a source?

The most promising source energy for the earth is always the sun. However, sunlight can be used for not only food but also several other purposes. It is therefore essential that solar energy has to be conserved and used very efficiently. In this direction, the attempts to identify novel renewable energy resources hold the key for several applications. At the same time, the consumption of oil-based fuels should be minimized to protect the environment and avoid the greenhouse effect – global warming. The evolution of life on earth has been mainly due to the predominance of solar energy as perceived by human eyes and the leaves of green plants. It is possible that plants have evolved with the green colour of chlorophyll in response to the solar spectrum. A strong light source, other than the sun, might possibly have resulted in the predominance of another colour and pigment.

Photosynthesis has the rare property of not just converting sunlight into usable energy, but also of consuming CO<sub>2</sub> from the earth's atmosphere. Can you see technological uses for this property in the future?

Photosynthesis results in the fixation of inorganic carbon into organic carbon which includes carbohydrates, lipids and proteins. The photosynthetic activity is dependent not only on sunlight but also CO<sub>2</sub> and oxygen. One of the major applications of photosynthetic capacity of plants appears to be its ability to fix atmospheric CO<sub>2</sub>. However, photosynthetic assimilation of CO<sub>2</sub> by the plant kingdom is unable to keep pace with the release of CO<sub>2</sub> into the atmosphere arising from anthropological activity involving both humans and industries. The serious problem of 'elevated CO<sub>2</sub>' in the atmosphere is a sad reality, as records have established that the average CO<sub>2</sub> concentration has increased from <300 ppm in 1900 to 381 ppm in 2006. This elevated CO<sub>2</sub> is

**Without the green pigment called chlorophyll, our forests – indeed our entire food chain – would look completely different. Nevertheless, onshore vegetation makes only a small contribution to photosynthesis compared to marine organisms.**

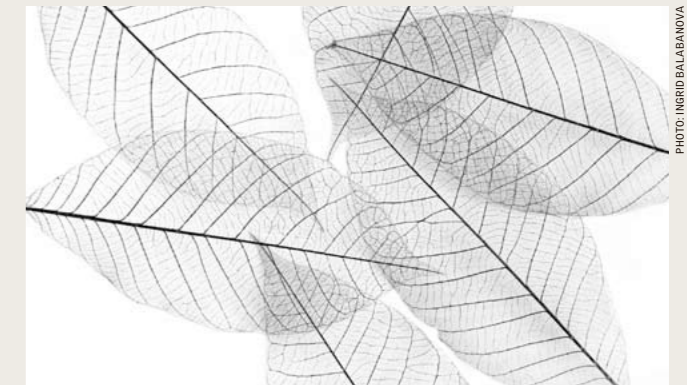


PHOTO: INGRID BALABANOVA

What would the global food chain look like without photosynthesis?

contributing significantly to the phenomenon of global warming, which in turn has disturbed the natural weather conditions all around the globe. It is imperative to maximise rates of photosynthetic carbon assimilation to minimise the effect of elevated CO<sub>2</sub> and subsequent global warming. Maximum consumption of CO<sub>2</sub> occurs not by forest trees on the earth, as we may think, but in the oceans by phytoplankton. The micro-environment of ocean surfaces as well as the forests should be conserved. Efforts should also be intensified to discover and exploit new 'energy crops', while minimising the release of CO<sub>2</sub> into the atmosphere.

With a global population that will reach 10 or 11 billion during the next generation or so, will we still be able to feed ourselves from naturally-grown plants? What changes to agriculture as it is practised today do you consider necessary?

It is difficult to envisage the global food chain without photosynthesis as the main source of energy for earth is the sun. Plants harvest the sunlight and are consumed by animals. Thus, the present food chain is almost completely dependent on photosynthesis. Alternatives to the photosynthetic process operate in micro-organisms, such as chemotrophic bacteria, which are capable of growing in hard conditions without sun and in the absence even of oxygen. As a rule, organic life forms on earth contain carbon, hydrogen and oxygen. It is possible that on the planets of the universe that do not have light, there are organisms that do not have chlorophyll, do not photosynthesise and may thus be composed of elements other than carbon, hydrogen and oxygen.

When light touches the human skin, it initially produces an intense but superficial aesthetic effect. Yet the effects of this touch go well beyond the surface. And it is precisely this non-superficial effect of light that is often essential for life. To what extent do you find this analogy to be relevant to your own work and research?

The growing population is a matter of great concern. I do not see any major limitation of food for the next generation but I am not very sure of the availability of natural food for subsequent generations. Multiple steps are needed to sustain the food supply from naturally grown plants. Non-conventional and novel technologies including genetic engineering may help to some extent. Yet conservation and optimised exploitation of available natural resources is essential.

The fact that the effects of light go well beyond the surface is true not only to human skin but also to surfaces of plants or micro-organisms. Plant tissues are known to be capable of both vertical and lateral transmission of light. Light is not only a source of energy but also acts as a signal for many processes in plants as well as in animals. It is suggested that the diurnal variation in the vigour and moods of humans are related to the length of the day. Because of such direct and indirect effects of light, the topic of transduction of light signal is a priority area of research in biology. Photosensitive molecules like chlorophylls, carotenoids and rhodopsin (the pigment in our eye) perceive light directly and respond by internal rearrangement and excitation of their reaction centres. The signal of light on the surface of plant or human tissues is perceived, transduced and transmitted to other parts of the organism in the form of secondary messengers or signalling components, such as pH, membrane potential, electrochemical gradient and levels of cations, such as sodium or calcium.

# 04 Nina Jablonski

**Nina Jablonski** is an anthropologist who is interested in several aspects of human evolution. Trained as a comparative anatomist and palaeontologist, Jablonski has studied problems of the primate and human fossil record for 30 years. In the last 15 years, her interests have turned to lingering problems of human evolution

that are not readily answered by fossil record. These include the evolution of human skin and skin colour. Jablonski currently lives and works in central Pennsylvania in eastern USA, but has lived and conducted field work in China, Kenya, Nepal and other countries. [www.anthro.psu.edu/faculty\\_staff/jablonski.shtml](http://www.anthro.psu.edu/faculty_staff/jablonski.shtml)

Mrs. Jablonski, what did the culture that you have grown up in, as well as your education, teach you about skin?

Most people, including me, learned about skin only informally in the course of growing up. I never received any formal education about skin. I have simply been interested in it for many years, and have been conducting research on it.

We take our skin for granted, even though it does many critically important things for us biologically and culturally. If you stand back and observe your own life and behaviour, and the actions of people around you, you can begin to gain a better appreciation of what skin does for us. Skin tells us a lot about one another. From just looking at someone, we can gain some idea of their age and state of health from looking at their skin. We also get some idea from skin colour about where a person or their ancestors may have come from.

If we stop to think more about skin, we realise that many of the most important interactions we have with one another are mediated by our skin. Skin as the organ of touch provides one of the main portals through which we communicate with each other and detect information about the world. Although we as primates are highly visually oriented animals, touch is essential to our normal development and well-being.

In your work and research, have you found this to be true? What discoveries about skin did you make yourself that fascinated you?

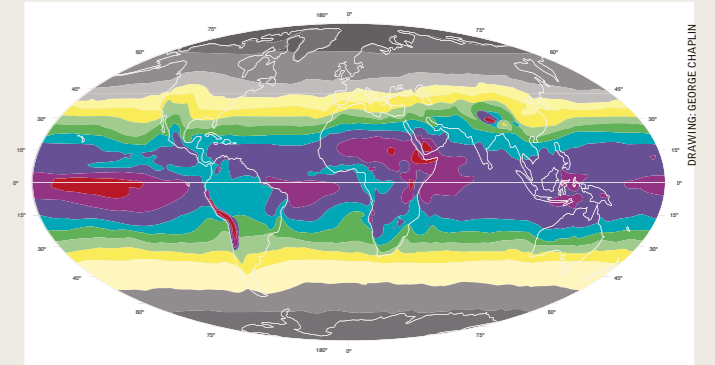
My own research has centred mostly around the evolution of skin colour, and the most fascinating discoveries I have made about skin relate to its colour. The amount of pigment we have in our skin evolved in relation to the levels of ultraviolet radiation (UVR) in the sunlight of the environments in which our ancestors lived. For those of us whose ancestors evolved in very sunny places close to the equator, darkly pigmented skin has evolved to prevent damage to the body from high levels of UVR. Those people whose ancestors lived in places outside of the tropics evolved lighter skin in order to be able to facilitate the production of vitamin D in the skin by UVR. What is fascinating to me today is that modern people move around very quickly, at rates much faster than any of our ancestors. We can travel thousands of kilometres in a few hours, and transport our bodies into solar environments very different from those in which our ancestors lived. Being humans, we assume that – just by virtue of being clever humans – everything will be alright. Well, sometimes, it is not. Light-skinned peoples suffer serious biological problems when they subject their bodies to intense sunlight, especially on a long-term basis. Similarly, dark-skinned peoples suffer other biological problems when they spend long periods of time outside of the tropics because their bodies cannot make enough vitamin D from the UVR in the relatively weak sunlight outside of the tropics. The lesson here is that we cannot escape our biology!

In your research so far, did you make any findings on how human 'beauty ideals' regarding skin varied in different human cultures?

Beauty ideals regarding skin vary dramatically from one culture to another. A wonderful example that I encountered recently concerns eyebrows. In most American and European contexts, women groom their eyebrows so that they are clearly separated and neatly defined. Among the Uighurs of western China, women encourage their eyebrows to be full and interconnected, so as to create a dramatic and expressive accent over their entire eye area. They even go as far as to rub a special cream between their eyes to encourage hair growth.

In connection with skin colour, we also see great differences between cultures in aesthetic choices. As an example, in Japan, women with very pale skin (showing no sign of sun exposure) are considered attractive and desirable because the light skin clearly demonstrates that the woman does not have to work outside and is likely to be of high status. In contrast, in many American and European countries, women with 'a healthy tan' are considered more at-

**Annual average UV radiation (UVR) levels at the earth's surface (as measured by the NASA TOMS-7 satellite). Bright pink and strong blue colours indicate high UVR levels, which are concentrated near the equator as well as in other dry or high altitude environments.**



To what extent does human skin, as the surface and boundary of the human body, play a role of communication interface other than through the sense of touch?

In the aftermath of the discovery of the ozone hole, the sun and its light play an ambiguous role in relation to human skin: they are, in a way, both friend and enemy. In how far can this ambiguity be traced back in human history, and how dependent is it on geographic and cultural backgrounds?

When light touches the human skin, at first glance it produces an intense but superficial aesthetic effect. Yet the effects of this touch go well beyond the surface. And it is precisely this non-superficial effect of light that is essential. To what extent do you find this analogy relevant to your own research on skin?

tractive because their tanned skin indicates health and leisure time spent out of doors. In both examples, the 'ideal' is the same – a woman of high status and leisure – but the 'ideal' appearance is very different because of the divergent histories of the two regions.

Today, ideals of beauty based on skin are beginning to merge as globalisation of imagery and advertising begin to influence peoples' aesthetic perceptions. In some cases, this is causing women to pursue ideals of appearance that are both unrealistic and unhealthy.

The appearance of human skin plays an important role in communication because it tells us a lot about a person. As I mentioned earlier, the skin communicates information about a person's age and health. It also tells us a lot about their physiological state. Are they sweating? Is their face flushed or very pale? These things can tell us a lot about a person's emotional state.

After we consider these things, we must then consider how people deliberately alter their skin's appearance to change the nature of the communications we send. Does the person use cosmetics to alter their appearance, for instance, to make their eyes appear larger or their skin more lustrous? Does the person have any tattoos or other forms of permanent self-decoration? Cosmetics and permanent skin decorations like tattoos are different expressions of personal advertising that tell us important things about our aspirations and identity.

For most of human history, sunlight has been considered a mostly positive influence on humans because sunlight brought warmth and because sunny times of the year were times when crops flourished and people were well fed. Because sunlight brings about the production of vitamin D in the skin, it is prized for its positive effects on human mood.

Ambiguity about the role of sunlight and human skin is a relatively recent phenomenon that has appeared only in certain agricultural societies within the last 5,000 or so years. This ambiguity has been most pronounced in places that have well defined seasons, with dramatically higher levels of sunlight in the summer growing season versus considerably lower levels in the winter. In these places, sunlight was associated with outdoor work and physical toil and so a life away from the sun was considered better, superior, and more privileged. This is why lighter-skinned people in these agricultural societies are almost always considered more desirable within their own culture – because they did not have to work hard in the sun to make a living. The presence or absence of a 'tan' was an easily visible label of one's class.

The 'feel good' effects of sunlight are based in part on the physiological effects of sunlight on the skin. The UVR in strong sunlight brings about the formation of vitamin D in the skin, and this imparts a transient sense of relaxation and well-being. Sun exposure can also lead to a tan on the skin that many people find attractive in themselves and others. The connections between sunlight and enhanced feelings of well-being and heightened self-image are just two of the reasons why many people take winter holidays in tropical places. Even inside a building, however, where glass often blocks most UVR, sunlight entering through windows imparts physical warmth and brightness that most people find uplifting. It is critical to remember in this connection that the human lineage has spent most of its six million years of existence in the tropics. From an evolutionary perspective, we are creatures of the sun.



# 05 Gary Schneider

**Gary Schneider** was born in 1954 in South Africa. He grew up in Cape Town and moved to New York in 1977. His history with painting, performance and film led him to photography. His *Genetic Self-Portrait* installation opened in 1998 at the Musee de l'Elysee, Lausanne, Switzerland and the Santa Barbara Museum, California, and was published in a book by LightWork. A survey of his work *Portraits* opened at the Sackler Museum in Harvard, Boston in 2004, and was published in a catalogue by Yale press. In 2005, the *Nudes* book was published and also exhibited by Aperture, NY. <http://museum.icp.org/museum/exhibitions/schneider/>

Mr. Schneider, what did the culture that you have grown up in, as well as your education, teach you about skin?

Growing up in South Africa taught me to be wary of racial prejudice. I realised early on that the surface is not where meaning resides.

Did this concept of skin change in the course of your career? What properties of skin have you discovered yourself that you consider important?

I have looked really closely at the surface of skin and other biology since 1975. I have discovered that scrutinising the surface leads me to meditation. Meditation or ritualised performance allows my subject to reveal itself. Skin is unimportant. It is merely what we see, it is not how we feel. I learned that light could be used to transform the surface so that it is no longer foregrounded.

In most of your portraits, you either get very close to a person's skin or literally look beneath it – as you did in your 'Genetic Self-Portrait' series. Do you feel that you get to know a person – or yourself – better by doing so?

The performance in all my work is structured so that both my subjects and I can learn about each other and ourselves from the process. We learn from the exchange in the making of the portrait. I interpret the information for you, the audience. I worked with scientists in 'Genetic Self-Portrait' and with friends and family when I make portraits using a camera. My experience of the portrait is different from my subjects experience or the audience's experience. My portraits are meditations on privacy and mortality.

Your *Genetic Portraits* and *Nudes* series do not show any of the concepts usually associated with portraits, such as beauty or expression of character. They are rather more of a scientific, methodical scrutiny of the human body. Do they represent the image that we will have of ourselves in the future, following the invention of DNA tests and biometric passports?

Identity is the main focus of my portraits. The photographic portrait often conflates beauty and glamour. Beauty motivates me but my work is never glamorous. Each body of work conforms to a reductive and rigorous methodology so that a comparison between the portraits is possible. I always try to set up a situation where I cannot fully control how I am collecting information and the subject cannot fully control what they are sharing. Each body of work is quite different. The genetic portraits are an archive of the history of the forensic sciences. The nudes and the heads that I began in 1989, are all composed and photographed in the dark using a small light source to examine the details of each person. The sequence of exposures is the same for each series. All the exposures are collected on one sheet of film over an hour to two-hour period. I have a poetic relationship to scientific methodology.

When light touches the human skin, it seems to produce an intense but superficial aesthetic effect. Yet the effects of this touch go well beyond the surface. And it is precisely this non-superficial effect of light that is essential for life. To what extent do you find this analogy to be relevant to your own work and research?

Light is my drawing medium. In the camera portraits, it tells me the story of my relationship to the subject. In the imprint portraits, like *Handprints* or *Mask*, light is purely metaphorical since the light areas are made from sweat and heat when skin touches film emulsion. They look like light. Light always tells me the story. Light has allowed me to get as close as I can get to truth.

**Left Gary Schneider:**  
***Genetic Self-Portrait Mask, 1999***  
For his series entitled 'Genetic Self-Portrait', Gary Schneider used photographic techniques from medical research to create a new image of the human body – from the individual chromosome to the handprint.

PHOTO: GARY SCHNEIDER

# 06 Ellen Lupton

**Ellen Lupton** is a writer, curator, and graphic designer. Her most recent books are *D.I.Y.: Design It Yourself* (2006) and *Thinking with Type* (2004). She is director of the MFA program in graphic design at Maryland Institute College of Art (MICA) in Baltimore. She also is curator of

contemporary design at Cooper-Hewitt National Design Museum in New York City, where she has organised numerous exhibitions, each accompanied by a major publication, including *Skin: Surface, Substance + Design* (2002). [www.designwritingresearch.org](http://www.designwritingresearch.org)

Mrs. Lupton, what did the culture that you have grown up in, as well as your education, teach you about skin?

I was born in 1963 and became a teenager and young woman in the 1970s. It was a time of sexual freedom and experimentation. Skin was everywhere. With the arrival of AIDS in the early 1980s, people began to think about skin in a different way. Today, we are accustomed to mediating skin with technology: protecting, repairing, improving. The natural skin and direct contact with the body is not so obvious.

Did this concept of skins change in the course of your career?

Today, there is more embrace of artificial skins and artificial surfaces. The idea of surfaces imprinted with images and information is more prevalent.

Was this proliferation of imagery, information and ornament on surfaces due to new digital imaging and manufacturing technologies, or was it simply a counter-movement to the mostly plain, unornamented 'skins' of things in the Modernist era?

The change is partly technical, because digital technologies change the design process as well as the manufacturing process and allow sensors, LEDs, and other 'intelligent' devices to be embedded into the surface of things. But I think the change is also due to the increasing importance of communications in all aspects of life. Everything now must speak, carry a message. The movement is global. The French philosopher Jean Baudrillard spoke of it when he wrote about the 'empire of signs' in the late 1960s. It was then that experimental designers were beginning to attack the idea of structure and to perceive design as a kind of publicity.

In recent years, human skin and natural surfaces in general have been setting new standards for product design and architecture. In your opinion, what aspects of living skins are particularly attractive to designers?

The idea of materials that emit and capture light is very powerful. Today, materials are not just a finishing touch – they communicate ideas and carry structure. The surface has become essential, not secondary.

Looking at recent developments in man-made surfaces, one has the impression that they often deceive the eye: hard things look soft and vice versa, and coarse things look smooth. Is eyesight becoming increasingly unreliable when it comes to surfaces and their perception?

With the rise of digital technology, we no longer rely on visual perception to verify truth. The visual surface is just as likely to deceive as it is to convey a stable reality. We are accustomed to digital 'skins' that can be customised and reconfigured.

When light touches the human skin, it seems to produce an intense but superficial aesthetic effect. Yet the effects of this touch go well beyond the surface, and it is precisely this non-superficial, non-visual effect of light that is essential for life. Do you find this analogy to be relevant to your own research?

Again, the capacity of materials to capture and emit light is one of the most provocative developments in contemporary design. It relates to the future sustainability of design: solar materials that literally become a source of power, whether expressed back to the living space through light or other forms of usable energy.

# 07 Aziz + Cucher

**Anthony Aziz and Sammy Cucher** have been collaborating on and exhibiting digital photography, sculpture, video and architectural installation works since 1991. They live and work in New York City. Considered pio-

neers in the field of digital imaging, Aziz + Cucher have exhibited their work in major museums and institutions both in the US and abroad. They are both members of the Faculty at Parsons School of Design, New York. [www.azizcucher.net](http://www.azizcucher.net)

Mr. Aziz, Mr. Cucher, what did the cultures that you have grown up in teach you about skin, and how far did this conception of skin change in the course of your career?

We can't recall any particular concept or idea about skin that was related to either of our cultural backgrounds or upbringing. It was not until we were personally and artistically confronted with the AIDS crisis that skin took on an important significance in our work and in our minds, even though our work has never dealt directly with AIDS as a subject.

AIDS made us keenly aware of the fragility of the human body and of the sophisticated mechanisms of defence and immunity that we have developed as a species. Skin is of course the main physical barrier that separates our inner bodies from the outside world, but the various metaphors associated with this duality of containment and separation became increasingly interesting to us - not only from the standpoint of biology and immunity, but in a more philosophical way that pointed to the limits of our humanity and of our consciousness.

Your work on skins can be understood as a comment on two important phenomena in recent design and engineering: prosthetics – the extension and, in part, replacement of the human body by technological means, and bionics – the emulation of natural skins and structures in man made things. What hopes and fears do you associate with these phenomena?

We became fascinated with prosthetics at the time when we were working on our 'Dystopia' series of 'erased' portraits, and along with the portraits we started envisioning objects that would populate the world of these subjects that had lost their sensory organs and turned inwards. The resulting sculptures and photographs, the 'Plasmorphica' series, had a very cold feeling, underlying our fears that modern technologies would lead us to a catastrophic loss of humanity.

This negative view was somewhat tempered in the works of the 'Interiors' series, where the human body has merged with the architectural environment in a metamorphic step which is both lyrical and uncanny at the same time. Today we have a more neutral position regarding any kind of technology, believing that it has enormous potential for both good and bad, depending on who uses it and how it is used. Our more recent works from the 'Synaptic Bliss' series could be said to actually celebrate a technological gaze that has allowed for the deepening and multiplying of perception.

When I was looking at your 'Chimera' and 'Interiors' series, I wondered: How would these sculptures and spaces feel if they were real and if one touched them? Hard or soft, moist or dry, smooth or coarse, warm or cold?

Your questions are exactly the kind of imaginative response that we like to see people having when confronted with these works. The fact is that we are not scientists and would not really be interested in bringing any of our creations to real life. We are very happy to stay in the realm of metaphor and speculation.

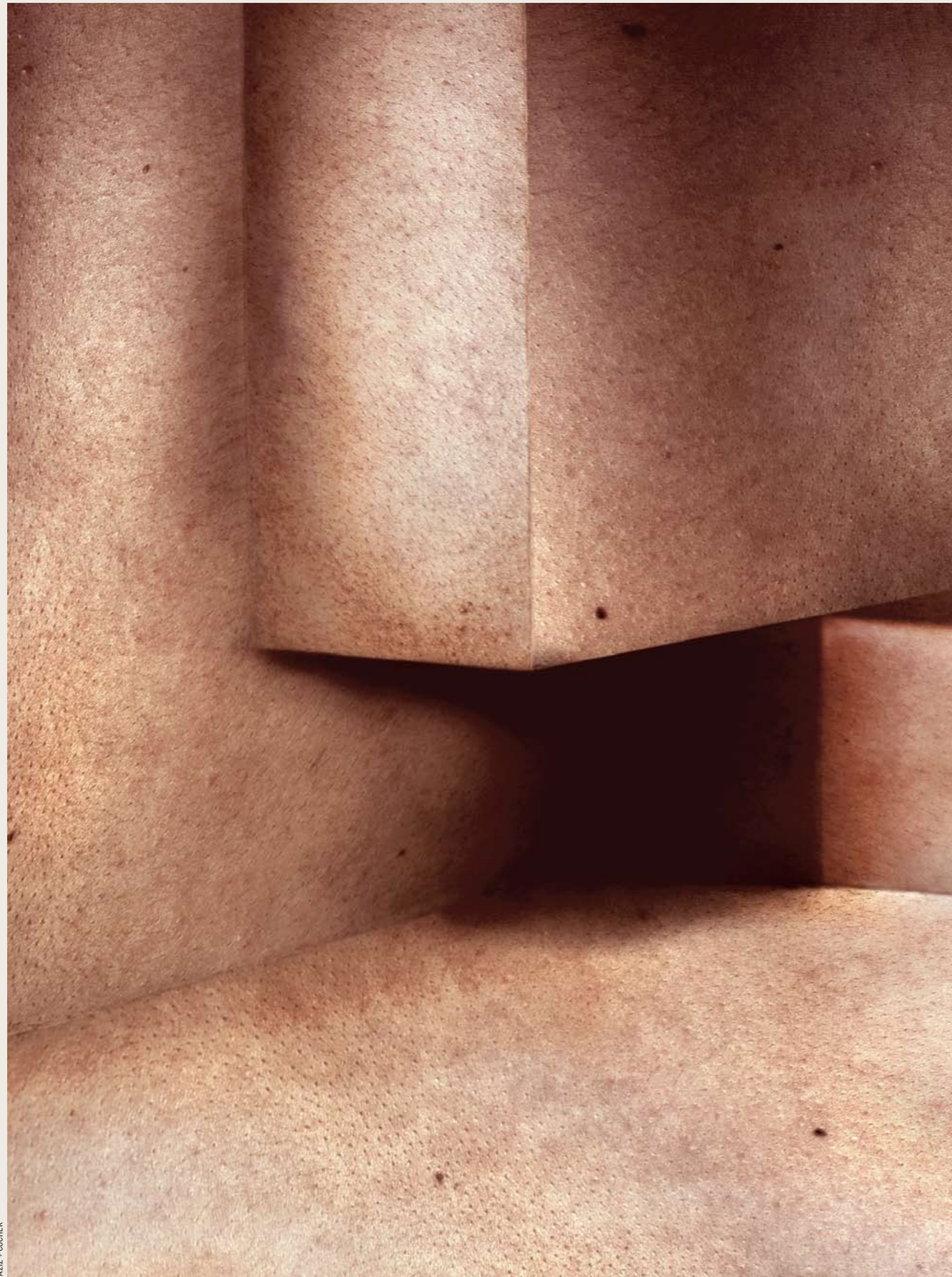
But if we must imagine such specifics, we think that all the works where there is human skin would probably feel soft, warm and perhaps a bit moist.

If you were to design an architectural space what would you want its skin to be?

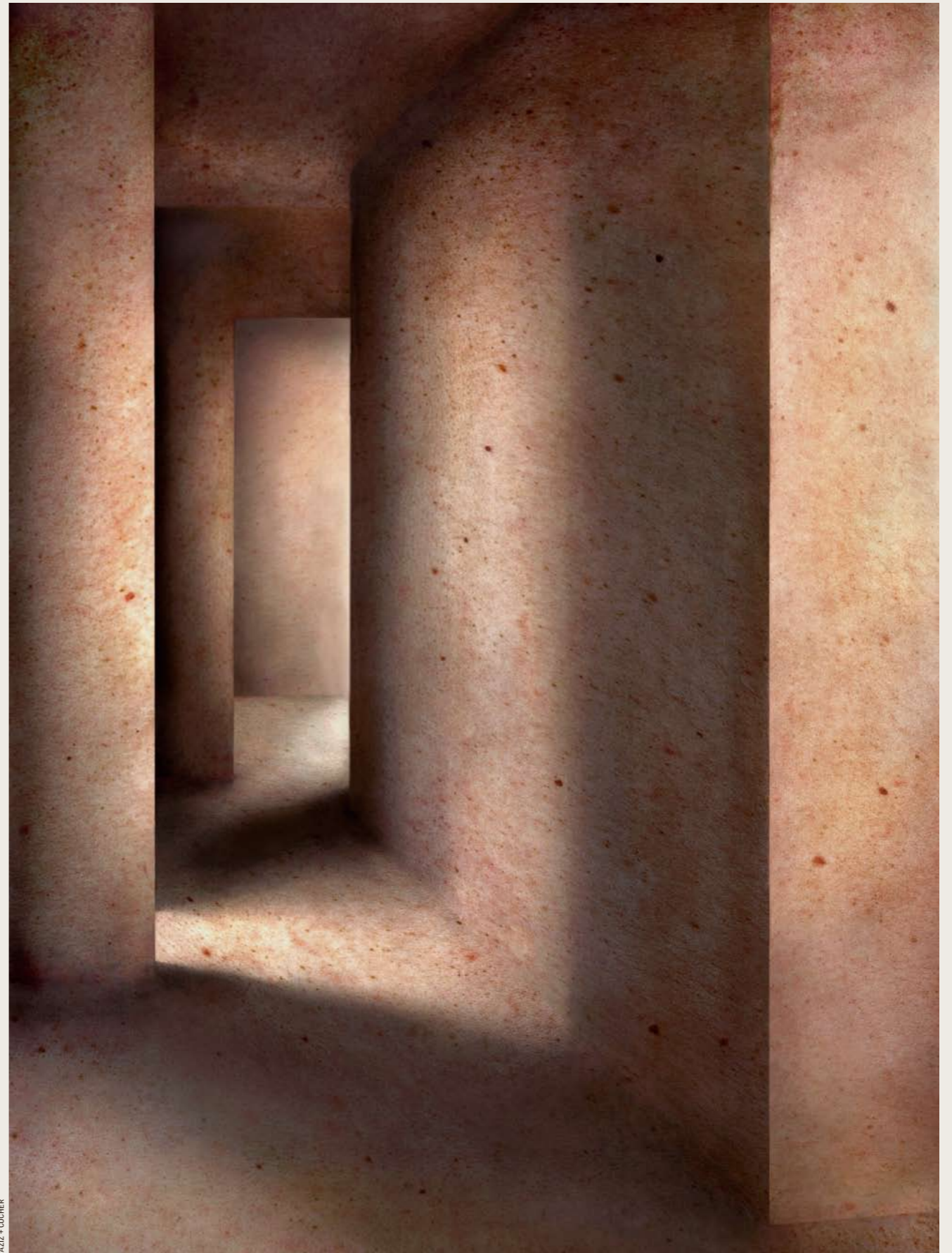
The skin is very rich in both metaphorical and functional meanings – wouldn't it be great to have buildings where their skins are not only containers but also sensors and transmitters of vital information? Porosity and elasticity are two qualities that would be very interesting to experiment with in architecture.

**Following double-page:**  
**Aziz + Cucher: Interior Study #3, 2000**  
**Aziz + Cucher: Interior #6, 2000**  
**The 'Interiors' of the artists, Anthony Aziz and Sammy Cucher, disconcertingly oscillate between two worlds: architecture and the human body.**





AZIZ + GUCHER



AZIZ + GUCHER

# 08 Thea Bjerg

**Thea Bjerg** is an internationally acclaimed textiles artist and designer. She has worked and experimented for more than two decades with light and shade, using the medium of textile materials. Among other acknowledgements, she has been awarded the Japanese Nagoya Design DO Award and the highest award for

artists in Denmark given by the Kold Christensen Foundation. Thea Bjerg's textiles are exhibited in museums in Peking, London, Cologne, Mexico City and more. Her work is also available for sale, for example at the MoMA Stores of the Museum of Modern Art in New York. [www.theabjerg.com](http://www.theabjerg.com)

Mrs. Bjerg, what did the culture you grew up in and your education teach you about textiles and their relation to the human body?

I was trained in the 1980s at the Faculty of Textile Design at the Danish Design School. We spent most of our time on the design of patterns, in other words, dealing with the question of how flat, one-dimensional textile areas can be 'filled' with colour and patterns. At the time, I didn't really see textiles as a particularly sensual or communicative material, in the way they are in my work today, and during our training, we only had a very limited relationship with the physical dimension of our work. However, there was a textiles engineer in the faculty who was seen as a bit of a freak. She experimented in a small way with special techniques and materials; I think that I absorbed her approach, which enabled me to explore some of the deeper possibilities of textile design.

What properties and qualities of textiles have you discovered yourself during your work?

Since I left design school, I have worked freelance as a textiles designer, and from the beginning, my work has had a very strong experimental orientation. Around 1990, I began to be interested in the question of how it would be possible to give a one-dimensional textile surface a three-dimensional expression. My way of working became very exploratory, but still had an artistic basis. I almost always work in a very hands-on way with my textiles, which gives me an enormous freedom to experiment with techniques and ways of expression that I have developed for myself and that it would be virtually impossible to adapt for machine production. The more I work with textiles as three-dimensional shapes and surfaces, the more sensuous and communicative this medium becomes for me. This does, of course, have a lot to do with the spaces and structures that are created in the process, in other words with the effect of light and shade in the fabrics. In my experience, people find it fascinating and inspiring that my textiles change significantly as the day progresses, as the light and weather outside change, and that they communicate in this way with the observer.

So you consider textiles to be a means of human communication. Can they signal something – for example in the way they hide or reveal certain parts of the body and thus attract the attention of the beholder?

In my AQUATIC project from 2004, there is a strong feeling of a direct relationship with the human body. I work here with folds and pleating techniques that I have developed over the years and that I combine in several of my works with printing and welding techniques. I call these works 'body sculptures' because they lend the wearer a silhouette of fabric. They are both soft and flexible, they can be draped around the body and they send out strong signals that there is something special happening, something sensuous. In my eyes, textiles are a very feminine medium, they really are ...

The sculptural design draws the gaze in a specific direction and at the same time requires of the observer that he or she enter a sensual universe on a voyage of discovery. I achieve this not least by endeavouring to hide but also unveil things, and in doing so, accentuate the elements of light and shade. It would, however, be wrong to assume that I am only interested in textiles in relation to the body – the materials I use have just as much an influence on spaces, either sculpturally or as a worked surface, and several of my future projects are going to concentrate on textiles as an installation or as a decorative element in a room. This may take the form of wallpapers, structures, screening elements or light filters.

For this reason, I would very much like, and would see it as a challenge, to be able to work together with architects who also see this potential and have visions of how textiles can be applied as an integrated part of buildings and other spatial interior situations. I mean this in both a practical and a decorative sense. Some co-operation of this kind would certainly allow unique textile constructions and effects to be created in a room.

**Right Thea Bjerg: Opaline Sea Anemone, AQUATIC, 2004**  
In her *Aquatic* project, Thea Bjerg uses ultra-thin, pleated polyester materials that veil the human body but nevertheless reveal its silhouette.

**Below Thea Bjerg: White Flowers, 1995**  
Silk satin with elastic backing.

**Following double-page The Bjerg: Dark Black Scorpion Fish, AQUATIC, 2004**



PHOTO: JEPPE GUDMUNDSEN-HOLMBREEN

What technical developments have influenced textile design in the last few years and will influence it in the near future? Has your own work changed at all due to these influences?

I have experimented during the past few years with new techniques like laser cutting and ultrasound welding. These are methods that can be used to cut and weld textiles very accurately. They have, in some ways, opened up totally new perspectives for me in the field of textile design. Just as an example, I have cut patterns out of fabrics and then pleated them to create a broken but still evenly structured surface. This is really inspiring and extremely decorative and, in relation to the projects I have just mentioned, it would be most interesting to work in this way with regard to lighting, shading light, the effect on an entire room, and so on.

When light touches the human skin, it initially produces an intense but superficial aesthetic effect. Yet the effects of this touch go much deeper. And it is precisely this visual and non-superficial effect of light that is essential for the organism in biology and medicine. Do you see this analogy as being relevant to your own work?

It reminds me of how much nature inspires me in my work as a textiles artist. Be it the structure of feathers in the wing of a bird, the layers of petals in a flower or the way a stone is corrugated, light and shade on the skin of a reptile – I do not observe them with the intention of copying them, but in order to transform the inspirations into a textile-based expression. In my AQUATIC project, for example, I was greatly absorbed by the universe below the surface of the sea, with its corals, flora and fauna and its colours, patterns and shapes. And, of course, by the light, in the way it is broken and transformed by the surface of the water, and as a result becomes something essential and life-giving for the structures and formations integrated in it.



PHOTO: ROBERTO FORTUNA



# 09 Dietmar Eberle

**Dietmar Eberle** together with Carlo Baumschlager heads up the architectural office of Baumschlager Eberle with branches in Lochau, Vaduz, Vienna, Peking and St. Gallen. For more than 20 years, Dietmar Eberle has lectured at international universities, including Hanover, Vienna, Linz, Syr-

acuse and Zurich, where he was Dean of the School of Architecture at the Swiss Federal Institute of Technology (ETH) from 2003 to 2005. Dietmar Eberle is an honorary member of the American Institute of Architects. [www.baumschlager-eberle.com](http://www.baumschlager-eberle.com)

Mr. Eberle, what have the culture you grew up in, as well as your training as an architect, taught you about building skins?

I grew up in Vorarlberg, a mountainous region traditionally lacking in infrastructure, where the population had to exercise extreme care and economy to survive over the centuries. The main focus of interest here was with benefit, in other words the ratio of input to result. In terms of their construction, form and facade design, traditional buildings are ideally adjusted to the region's climate. They are the culmination of an impressive understanding of the laws of physics accumulated and handed down over the centuries, which provides pointers for the economical use of limited resources. At university, I acquired the skills I needed to extract the maximum possible physical and technical design-related potential from different materials. I learned not to envisage the building envelope as a fixed variable, but as a transition zone comprising several levels which mediates between the poles of inside and outside, light and dark, cold and hot, public and private. Spaces such as covered forecourts, entrance halls, loggias, unheated conservatories or window reveals in particular offer a special appeal as they always entail both these options.

What new discoveries of your own have you been able to add to this?

I have realised that the appearance of the building envelope assumes a key role in the sustainability debate. As experience shows, it is not a building's technical quality that determines its life span, but its social and cultural dimension. Buildings only grow old if they are able to achieve a special level of social acceptance – and this is decided first and foremost at the level of sensory perception. Architecture communicates itself to the observer primarily through its surface; the materialisation of the building envelope is the most extensively elaborated aspect of any building description. This is why, as an architect, I pay particular attention to the use of natural materials that grow old gracefully. I have also recognised that the spatialisation of the facade I just talked about represents a special quality in terms of the way a building communicates to the outside world.

There has been a lot of debate about the technological aspect of architecture, especially of building skins, as it is expressed in the 'high tech vs. low tech' argument. What underlying interests are at play here, and what is your standpoint on this issue?

Amid the whole debate surrounding the technological content of buildings, the actual fundamental issue tends to be forgotten: how to create comfort and well-being. This is what building is actually all about. People aren't interested in whether a building consumes a few watts more or less; what counts for them first and foremost is comfort and the degree to which a space will enhance their quality of life. I personally believe that all technological wizardry that does not have a direct and unconditional bearing on the experience of comfort should be stripped away. Particularly mobile technologies which are exposed to constant mechanical stress have the drawback that they require periodical maintenance. They are generally subject to a faster process of decay than for instance the static elements of a structure. The need for as little operation as possible is also another aspect of improved comfort and convenience. To keep a building working sustainably in the long term, the technology does not need to be optimised, but minimised.

Which triggers do you believe are set to influence the development of building skins in the near future; and which developments do you predict?

The reduction of energy consumption is an issue of major social relevance. In developed societies, the construction and running of buildings alone account for 50 to 60% of the primary energy requirement. We who are involved in the building industry can and must have the greatest input when it comes to resolving the problems surrounding the use of natural resources. We must aim to construct buildings so as to enhance their capacity for self-regulation and to respond with extreme precision to local climatologies. However, endeav-

**Right Baumschlager Eberle:**  
**Administration building Saeco,**  
**Lustenau, 1998**

**Far right Baumschlager Eberle:**  
**Living on the river Lohbach,**  
**Innsbruck, 2000**

**Following double-page**  
**Baumschlager Eberle:**  
**BTV, Wolfurt, 1998**  
**Residential facility, Eichgut,**  
**Winterthur, 2005**



PHOTOS (PAGES 53-55): EDUARD HUEBER

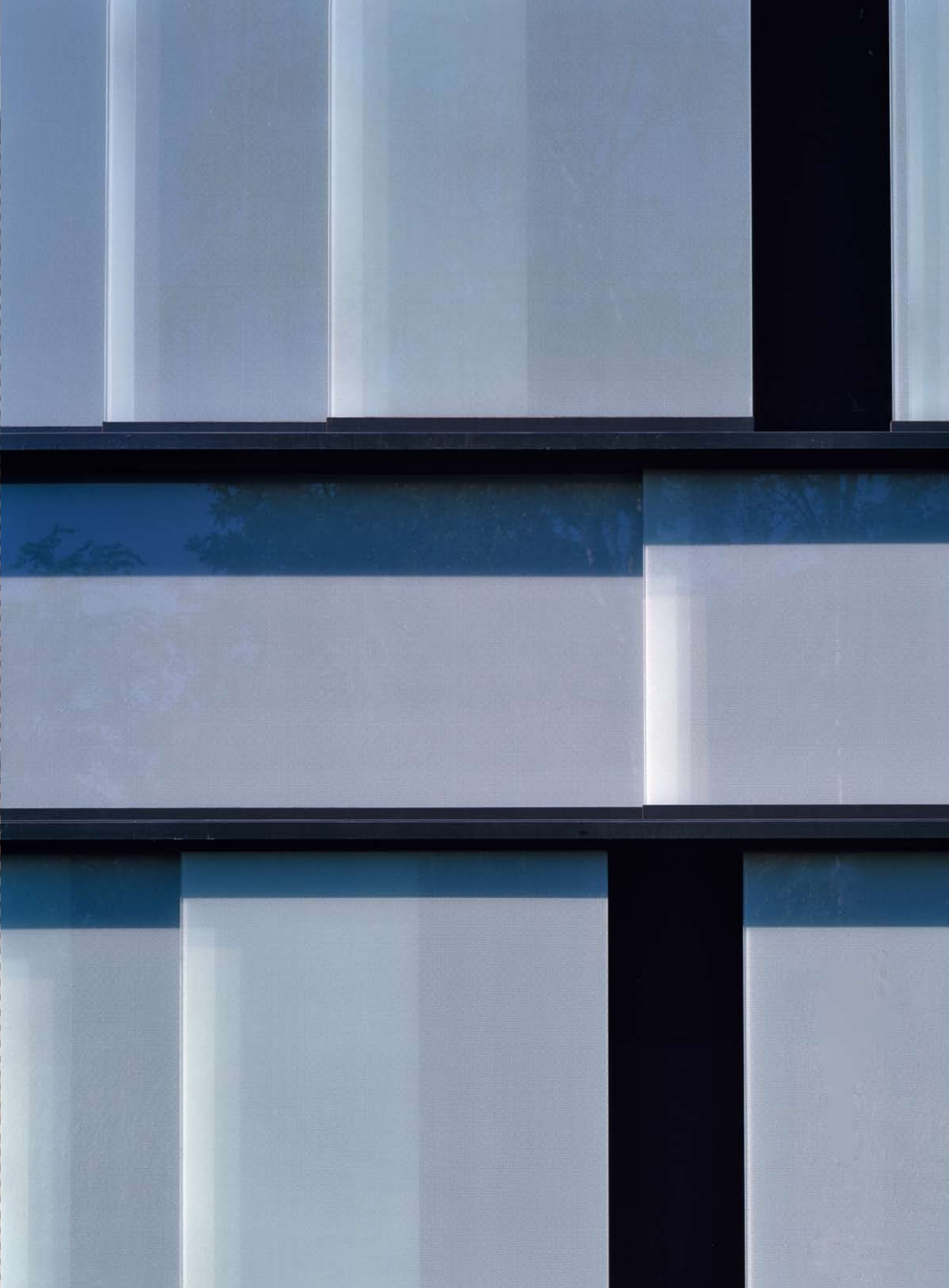
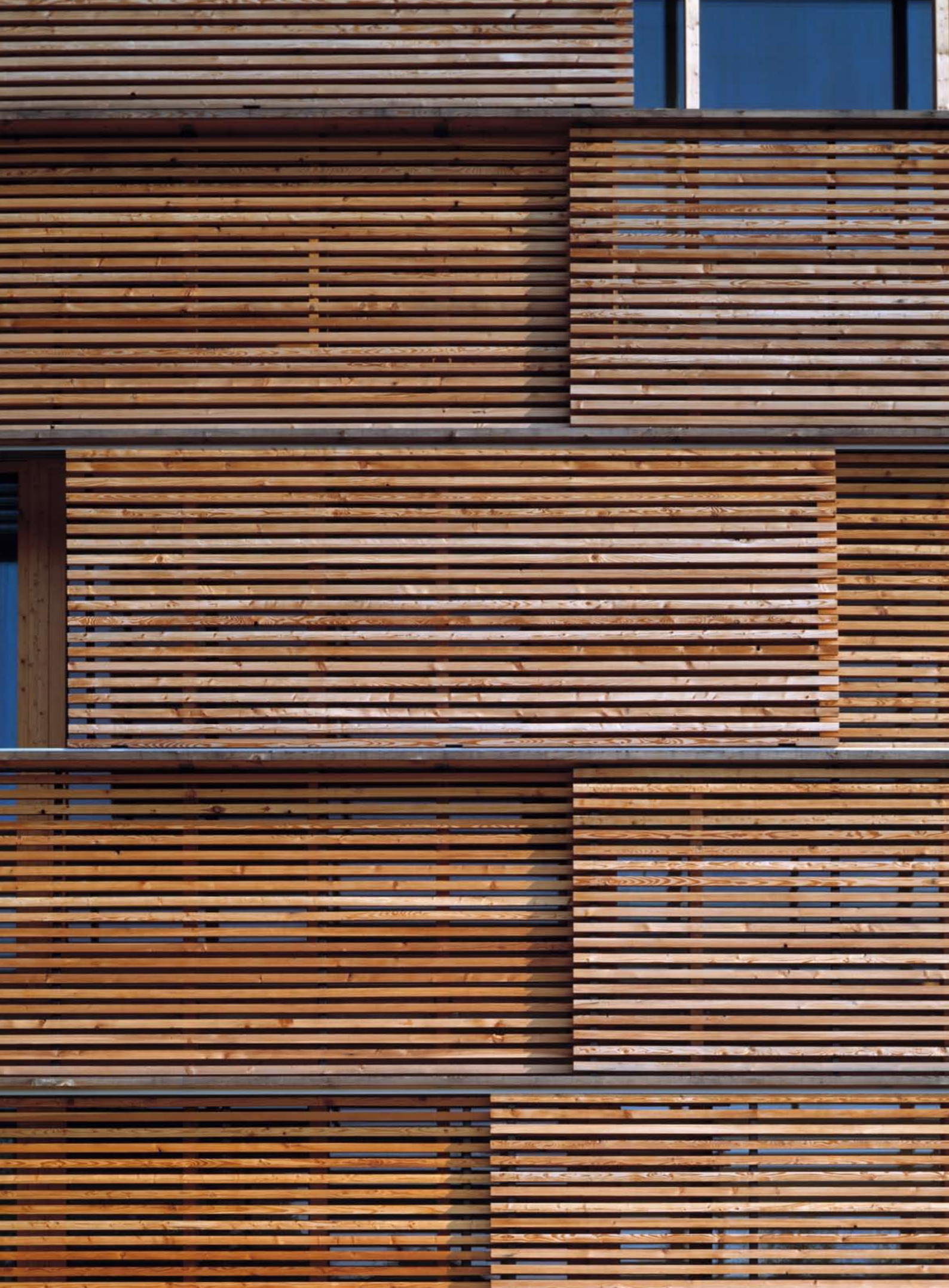
What light qualities do you seek to lend the interiors with the building skins you design?

ours to optimise the energetic properties of facades only make sense where the building is viewed as an integral system. The building envelope and technology represent the most essential parts of this integral system, which work in interaction with each other. Taken overall, an ever wider range of higher-grade materials with effective physical properties are being made available to us at economically sensible prices. This development is particularly noticeable in the field of glass technology. Here, developments are moving towards a situation where glass qualities are able to adapt automatically to environmental influences such as changing light conditions. Major changes are also foreseeable in the field of insulation technology, where a reduction of insulation thicknesses is taking effect simultaneously with an improvement in quality. In the more moderate climate zones, this means that heating will already be superfluous in the not too distant future. In general terms, far fewer technological house installations will be required.

First of all, I believe – whether we are talking about housing, offices or public buildings – that the same priority issue applies: How to engender a sense of well-being and comfort for the people using them. Building is the distinction between inside and outside. It is the act of sectioning off a unit of space inside whose fundamental characteristic is that it complements the status outside; in the darkness, in providing comfort and security, and protection against wind and weather. Daylight links the inside with the outside, but its mediating effect can only be put into practice if there is an incline in the level of brightness between the inside and the outside space. The steepness of this incline depends on the characteristics of the building envelope, and on the number of local penetration points through it. The more light it admits, the more the inside tends to lose its specific indoor feel and the associated feeling of comfort and safety. I think it is an error in reasoning to attempt to match the lighting situation inside a building with that of the outside space. My projects attempt to create technical and building structures that offer exciting transition zones between light and dark and open up scope for ambiguity.

When light touches the human skin, it initially produces an intense but superficial aesthetic effect. Yet the effects of this touch go well beyond the surface. And it is precisely this non-superficial effect of light that is essential for life. To what extent do you find this analogy to be relevant to your own work and research?

As in the field of medicine, what interests me in architecture too is not the immediate physical effect of light radiation, but rather what the incidence of light achieves in its totality when it interacts with its adversary, shadow: it creates a certain atmosphere. However, this is something we experience only by physical encounter when we actually walk through buildings. Meanwhile, in architectural designs light conditions are confused with visual conditions, and the senses other than through the eye are neglected. The tendency is to attempt to create 'optimum' light conditions which are as bright as possible and which approximate the effects of artificial light with the aim of facilitating vision. Daylight, conversely, changes with the passing of time. Studies show that it is precisely this changeability that exerts a positive influence over the sense of well-being we experience in a space. This is what makes it so important that we understand daylight not as a static factor but that we integrate it as a dynamic parameter into the design, allowing the



# 10 Kengo Kuma

**Kengo Kuma** was born in 1954 in the Japanese Prefecture of Kanagawa. In 1979, he completed his study of architecture at the University of Tokyo. After a graduate scholarship to Columbia University, he founded the Spatial Design Studio in 1987 and his current company Kengo Kuma & Associates in 1990. From 1998 to 1999, he taught at the Faculty of Environmental Information and since 2001 he has been teaching at the Faculty of Science and Technology of Keio University in Tokyo. [www.kkaa.co.jp](http://www.kkaa.co.jp)

Mr. Kuma, what did the culture that you have grown up in, as well as your education, teach you about light?

The house in which I was born and where I grew up was in a suburb of Yokohama. It was a small wooden house dating from before the Second World War and its architecture was completely different from that of my friend's house, which had been built in the sixties. It had a long porch, the window frames were made of wood and inside, in front of the glass windows, there were sliding doors made of Japanese rice paper. There was only one room with tatamis (straw mats) on the floor, but that was the room I liked the best. To sit on these tatamis and play with my building bricks while the warm light of the evening sun penetrated the sliding doors and bathed me in its light meant happy hours for me.

How far did this concept of light change in later years, especially during your career as an architect?

The architecture we were taught at university was based on cement, iron and glass and was therefore entirely different from that of my home. Nor did I learn anything about the utilisation of light at university. Just how important the relationship between architecture and light is was demonstrated to me once again in 1985, when I lived in New York, through my conversations with the lamp designer Edison Price. I had placed tatamis in the living room of my apartment in New York and often drank tea there with my friends; that was where he told me an anecdote about the time he had worked together with Mies van der Rohe and Louis Kahn. Somewhat surprised, I asked him whether Mies and Kahn had also spent much time considering the problem of light and I thought that I too should like to think about a style of architecture that concerned itself with light. That was when I decided to take another look at the traditional Japanese with which I had been familiar with since my childhood. I gave those New York tatamis to Edison and have since heard that it was one of them that he died.

In his book 'In Praise of Shadows', Junichiro Tanizaki explains the cultural differences with regards to light and its interaction with material surfaces that existed between traditional Japanese and modern western cultures. In which of these traditions do you see your own work?

Tanizaki's 'In Praise of Shadows' is a wonderful book. He clearly describes how the differences between two cultures can be explained by their different treatment of light. That is how important light is for a culture! But, unfortunately, after the Second World War concrete came to Japan from the west and it has completely destroyed the cities and architecture of the country. It is not just the 'hardware' – the cities – that were destroyed; the 'software' – the culture – has also suffered critical damage. What I am trying to do is to repair this damage. It is necessary to retain natural building materials such as wood even in large buildings and also important to preserve the sensitive handling of light as described and praised by Tanizaki.

You have stated several times that after the 20th century, which, in architecture, was a century of form and material, the 21st century will be a century of light. What evidence has brought you to this conviction?

The 20th century was an age in which architecture was experienced through the medium of photographs. To put it simply, architecture that looked good on photographs was popular. And photogenic architecture is an architecture of shapes and forms; in other words, it has characteristic shapes. But in the 21st century, direct experience gained by visiting a site personally is becoming increasingly important for people. Through the direct experience of the object and the spatial entities people are hoping to experience an emotional input. In this situation, light and materials become the most important factors in a design. Direct communication between the material, the light and the human body is created. We live in an age in which architecture must be newly defined and must take these connections into account.

**Right: Kengo Kuma & Associates: Office and showroom Z58, Shanghai, 2006**

**Far right and following double page: Kengo Kuma & Associates: Ginza Onsen Fujiya, Obanazawa, 2006**  
In many of his buildings, Kengo Kuma resurrects the semi-darkness of traditional Japanese houses described by Junichiro Tanizaki in 'In Praise of Shadows'. He does this by arranging for the light to be broken up in a dense weave of illuminated and shadowed areas.



How will the principles of the use of materials in architecture change in the 21st century?

Concrete and iron were functional materials that allowed the creation of free forms. On the basis of this concept, form was the highest goal and building materials were subordinate to form. But in the 21st century materials communicate with the human body. The body hopes for healing through materials. The choice of materials for a building must be based on these associations. Natural materials such as wood, paper or stone will once again attract attention in accordance with the new maxim of creating an interplay with the body.

In our visually dominated culture, we recognise a place mainly through the form of its elements, less often through material or by smell or sound. What role does light play in this context?

Light plays an important role in the consciousness of a place. Every place has a characteristic light, particularly when it snows or rains. That is why, although I actually do not like photographs of architecture, I permit my buildings to be photographed on days when it is raining or snowing, because I can thus record the special 'meeting' of this particular and unique light with the building.

Could you briefly explain what is meant by the 'particle-isation' of light, a strategy that you frequently adopt in your projects, and what importance this strategy has?

'Particle-isation of light' means ascribing importance to the exact impression created both by light and by shade. The traditional Japanese window grille is an excellent detail that shows the dissolution of light. Because the most beautiful expression of a particular material becomes visible at the border between light and shadow, I devote particular attention to this transition in my designs.

When light touches the human skin, it seems to produce an intense, but superficial aesthetic effect. Yet the effects of this touch go well beyond the surface. And it is precisely this non-superficial effect of light that is often essential for life. How far do you find this analogy to be relevant to your own work and research?

When I think about my architecture I often use the analogy of different types of human skin. We can see the surface of the skin, but what lies on the underside with all the layers, one on top of another, is also projected to the surface. By looking at the surface we can sense everything that lies beneath – the state of health, age, power, energy.

This is why I design the underside of a construction as carefully as I do the surface of the skin. For example, a 2-cm-thick layer of stones embedded in concrete creates a quite different skin than stones carefully piled up on top of one another. I try to achieve a detail that will make this difference clear to people.



Together with Dr Christoph Geissmar-Brandi, **Ulrike Brandi** manages the agency Ulrike Brandi Licht in Hamburg, where she has developed lighting concepts for such customers as the British Museum in London, the Mercedes-Benz Museum in Stuttgart, Pudong Airport in Shanghai and the Elbe Philharmonica in Hamburg. In addition to her practical

work, Ulrike Brandi has initiated numerous research projects, including one on the use of glass in museums and one on the development of light diodes. She is the author of several specialist books on the topic of light including *Light Book*, which was published in 2001 by Birkhäuser. [www.ulrike-brandi.de](http://www.ulrike-brandi.de)

Mrs. Brandi, what did the culture that you have grown up in, as well as your education, teach you about skin?

The landscape where I grew up influenced my awareness of light more strongly and directly than my culture did. In Northern Germany daylight surrounds us in the form of a vast dome of sky overarching a flat green landscape. If the windows of an apartment face west there will be a view of the sunset, which sometimes looks as though it were on fire. A sunset like that can send me into raptures.

But great physicists and astronomers such as Johannes Kepler, Isaac Newton, and Galileo Galilei, also influence my way of dealing with light. I admire their discoveries of the properties of light and their formulation of its laws. Spectral analysis can tell us about material existing at unimaginable distances from us. We use light to measure the movements of celestial bodies. Light is fast – and yet it also allows us a glimpse into the universe's past. I can think of several beautiful poems on light in our culture, for example 'The Maiden Stood by the Ocean' by Heinrich Heine:

The maiden stood by the ocean  
And heaved a heavy sigh  
So deep was her emotion  
To watch the sunset die  
"Dear maiden, look more gayly  
The tale's as old as time:  
The sun goes down before us  
And rises again behind."

But I continue to learn about light all the time, for the past offers us no definitive lessons. When I decided to specialise and focus only on light, I was afraid that this was an allegedly 'limited' subject that would not be sufficient for a whole lifetime – now I know that a whole life is not long enough to encompass what there is to know about light.

It has often been claimed that in contemporary architecture light has become a building material in its own right and is utilised as such. Would you agree?

No, light plays with different materials and surfaces but it is not an actual 'component' of buildings. It is either just there or is cleverly allowed in through the windows or delicately reflected – its substance is completely different from that of any building material.

When planning lighting nowadays, the discussion no longer revolves around the alternative of 'daylight or artificial light' but increasingly on the mutually complementary aspects of daylight and artificial light. Has this made the work of lighting designers easier, more difficult or simply more interesting?

To talk about daylight and artificial light as alternatives would be stupid; maybe that happens if one chooses a purely 'electrical engineering' approach. For me, planning artificial light always begins with a contemplation of the specific type of daylight present at a particular location. Is the sun high in the sky in summer? How far will sunlight extend into the room in the evening? Is twilight a long drawn out affair? Is the weather usually clear or more often cloudy? The architect considers similar aspects before deciding on the materials he will use, and the best thing is if he discusses his ideas with me.

**Below UN Studio: Mercedes Museum in Stuttgart, 2006**  
For the new Mercedes Museum in Stuttgart, Ulrike Brandi dreamed up a concept of daylight and artificial light that adopts and develops the duality of strongly extroverted 'collection rooms' and inner 'myth rooms'.

Currently new architectural materials are being discovered in quick succession, emerging and often disappearing again very quickly. How do you take account of their specific properties with respect to light in your work?

When we (architects and lighting designers) test the effects of different light on new materials together, we develop a feeling for what will work and what will give rooms a new, sometimes unexpected, quality. We also recognise when a material does not meet expectations or where astonishing effects occur that are simply amusing. It is fun to know all that. It is a matter of art – or of one's own assurance – subsequently only to make use of those elements which will make a room more beautiful, more enjoyable and more harmonious.

When light touches the human skin, it initially produces an intense but superficial aesthetic effect. Yet the effects of this touch go well beyond the surface. And it is precisely this non-superficial effect of light that is essential. Do you find this analogy relevant to your own work?

Of course. I do harbour the hope that our atmospheres of light get 'under users' skins' – because of their beauty, because they precisely meet our needs, because they are relaxing or pleasant or exciting. Quite often we will only feel deeply moved after some time has passed, or if we can feel a special closeness to a place that is still present even after visiting it many times.



PHOTO: DAMLERCHRYSLER AG



# 12 Steven Scott

**Steven Scott**, born in London in 1955, lives and works in Copenhagen. He has also lived in London, Berlin and Amsterdam and has worked extensively in theatres across Europe. Since 1997, he has shown regularly in Germany and Denmark in galleries and museums. He is represented by Galleri Weinberger, Copenhagen and

Galerie König, Frankfurt. He has light art works in public collections in Austria, Denmark, Germany, Holland and the UK. In 2006, the book *Seventy Seven* was published – it is about Steven Scott's *Light Art Installation* at the Deloitte Headquarters in Copenhagen. [www.stevenscott.dk](http://www.stevenscott.dk)

Mr. Scott, what did the culture you have grown up in, as well as your education, teach you about light?

I was brought up in inner London. My thoughts on light had always been connected to the changes of city skyline and the beautiful colours of the sky. From the age of around ten, my father, who worked in the theatre, took me backstage and I was fascinated by the atmospheres created in this illusory world. I guess my sense of the two worlds, of the real and the unreal developed during these years.

Did this conception of light change in the course of your career? What properties of light have you discovered yourself that fascinate you?

My early work in theatre at the Royal Court and Riverside Studios greatly influenced my process of work and my career. The lighting style of the designers at that time, the late Andy Phillips and Rory Dempster, worked largely with lamp temperature intensity to create colour, low output creating warm and high output creating cool. Very little primary colour filters were used. The economy of the use of colour and the variety of perceived colours triggered me to explore. You can trace a line from the directors and designers working at the Royal Court during these years, back through George Devine to the Motleys and back to the great Edward Gordon Craig in the early part of the 20th century. Having only seen prints of Craig, I could see that he shaped space with light. These values of light, space and form have remained with me ever since.

You used to work a lot in theatres, which are basically, in terms of lighting, black boxes. What was the greatest challenge you faced when you stepped out of the dark and started working in places where there is ambient light and daylight?

My first step was still in theatre when I worked in the open air. Most performances start during dusk and it was thought to be a massive problem as it was not a black box and there was a lack of controlled lighting. I soon realised that the setting sun would become part of the light environment of the performance. The slowness of this first fade out (sunset) and how one's eye adjusted to the surroundings and the transition to artificial light had a lasting effect on me. These early experiences in the theatre would later help me in my experiments that led to works in the gallery and later in the landscape and architecture.

Colour plays a major role in your work, yet the capacity for mankind to distinguish colours is rather limited. Can this capacity be trained or extended in your opinion by working a lot with coloured light?

I am not sure if one person's colour perception will ever be the same as another's and of course we have charts and definitions of specific colours. It is a science.

I am working as an artist with colours in light that are constantly changing, and again are changed by the surface and texture that the light falls on. Then if the ambient light is changing constantly, the way that we see is totally transformed in more than one way. Surface will influence colour, texture will influence colour and of course the ambient light will affect the work as a whole. I have learnt to embrace the changing ambient light so that it enhances my ever-changing works. The result is that the likelihood of a single work ever being seen in the same way is negligible. My works describe a process of change and are never seen in the same way again. In themselves they do not change beyond the programmed changes but are viewed in ever changing circumstances – they constantly push themselves outside these constraints. I let go of the control issue and make it part of the work. The works become another element in the general question of perception of colour.

**This page and following double-page: Steven Scott: *Seventy-Seven*, 2006 Steven Scott's light installation for the head office of Deloitte in Copenhagen confronts the change of daylight and the movement of people in the atrium with its own dynamism. Wide black stripes lend rhythm to the undersides of the stairs and bridges on which differently coloured areas appear to 'wander along'.**



PHOTOS (PAGES 61-65): ADAM BIRK

Working with colours, are you aware of the feelings and moods that they induce in people? Is there an inter-subjective perception of colours and the moods that they produce, or do you think each colour is perceived differently by different people?

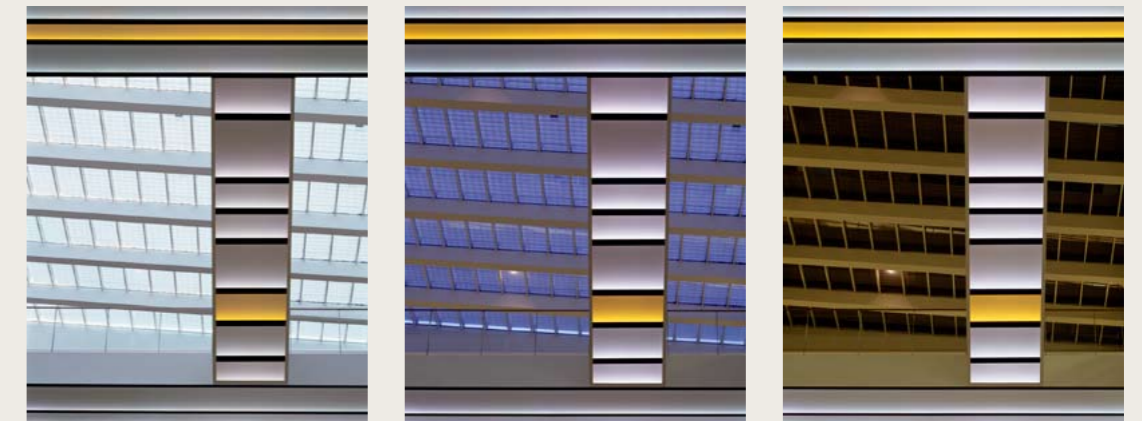
Feelings and moods vary greatly between individuals and I have this awareness with me all the time when I create my works. I do, however, believe that most people wish to have a balance in white light as the harmonious colour that we wish to see in equilibrium; a subconscious need for white as the equilibrium of the colours we perceive. When I push a colour mix in the red/green part of the spectrum, I miss the colour blue. This personal experience is the reason why the vast majority of my work is about the full spectrum of colour within a single work, combined with the imperceptible change in colour. I want the eye to see this harmony of colour and change.

What is your view on how daylight and artificial light should interact with each other in architectural space? Can you identify specific uses or purposes that only artificial light - or only daylight - is able to fulfil?

In general, I find that most buildings are over-lit and most urban areas are badly lit. I would like to see more in-depth study on how daylight and direct sunlight enter an architectural space to create daylight conditions that harmonise elegantly with similar artificial light scenarios after sunset. The 'two lights' need to be attuned to each other.

To what extent do you consider the changeability and periodicity of natural light a paradigm for the work of light artists like yourself?

It is a primary part of my work and I would think for most artists that work consciously with light in an architectural setting. Understanding the direction, the time of day, the time of year, the angle of the sun to the surface its light falls upon are all essential elements to creating a successful work that is under the influence of ambient natural light and direct sunlight. A successful work embraces natural light.





# 13 Michael Bleyenberg

**Michael Bleyenberg** studied art in Düsseldorf/Münster and Braunschweig. After the master class under Norbert Thadeusz and the state exam he worked in studios in the USA in Mexico before setting up in private practice in Cologne in 1995. Since 1992 Michael Bleyenberg's work has focussed on holography, laser technology and electronic media. In 1994, he was awarded a diploma for au-

diovisual media at the Art College for Media in Cologne where he also worked from 1994–2002 as an artistic/scientific employee. Michael Bleyenberg has received many awards for his holographic works and has been a member of the International Kepes Society in Hungary since 2006. <http://holonet.khm.de/eyefire/vita.html>

Mr. Bleyenberg, what did the culture in which you grew up and your training convey to you about light?

The pictures, copies and prints of Christian art in the village rector's house where I occasionally spent my holidays as a child made the first lasting impressions on me. My decision to go into painting - and not to follow my many years of training with a career in music - is probably attributable to my Christian upbringing in a Catholic environment.

I was involved with painting during my training at the academy and then exclusively for a further ten years. Through my interest in painting, I was also confronted with the phenomenon of light. Light is a significant field of force in painting. Light, its manifestation in colour and its contribution to the creation of spaces was the essential object of my investigations, after I had liberated myself from the conventions of perspective and figuration. Initially it was above all the representatives of European expressionism, such as the Fauves and the painters of the 'Bridge' and later on, the American colour field painters such as Ellsworth Kelly, Kenneth Noland and Barnett Newman, who were my role models.

The provisionally final step of my painting development towards a concentrated, abstract treatment of light and space was the departure away from painting towards new media such as holography and its likewise interference-based additional forms.

What properties of light have you discovered with this medium during the course of your own work?

For some ten years I experimentally investigated the aesthetic qualities of interference and laser media in the light and laser laboratory at the Art College for Media in Cologne. From the very beginning of my laboratory work, I was captivated by the special light situation during the take up and by the exceptional quality of light in the end result of the hologram. In contrast to the other light sources I had previously come to know, both the laser light and the reconstructed holograms possessed an exceptionally atmospheric and emotional power. The setting up of a holographic camera was not only a means to an end, but also appeared like an architectonic light scenario in the form of a model. A whole new world opened up and I felt the proximity of new boundaries that needed to be crossed.

Whilst gaining experience with holography, I began to sense the potency of this medium, once on the stage, with respect to medial production and to architecture. The special characteristics of the broken laser light and its shape-generating potential led me at a relatively early stage to the vision of wanting to build with light, a notion that at the start of the 90s still seemed utopian. Indeed, many things initially remained at the model stage since the technical conditions has not yet been created. Only later did foil technology (originally developed for building) show me ways how the visions of building with light could in fact become reality.

Holography uses a two-dimensional image carrier, but is perceived as being three-dimensional. For the artist, how does working with this medium differ from photography and painting on the one hand, and from sculpture on the other?

Your question refers to the classical three-dimensional imaging process which in artistic-design production is only really of secondary importance. I believe that the task of art is not to portray, but rather to create new things. The possibilities of technical media for artistic design generally lie not in the simulation of what is already known, but in the creation of potential spaces.

Yet holography is both a spatial and a light medium. In recent years, for instance, I have increasingly turned my attention to the light qualities of the laser media. During my activities, I have tried to fathom the possibilities of angel-like, immaterial light 'beings' unaffected by gravity. Like many artists, I was and indeed remain fascinated by weightlessness and the removal of ma-

You mentioned your own laboratory experiments. How did you conduct them?

terial constraints. This can only be made a subject of discussion by technical means. Characteristic of my work with interference-based media is the floating of spaces. Their elements mutually pervade each other, they create permanent transparency, visible only through the colour of spectral light that leave associations in a picture puzzle-like uncertainty. They leave behind the indeterminate feeling of never having seen everything and, as such, become projection screens of possible meanings.

I have already mentioned the connection between holography and painting. Holographic artefacts are both sculpture as well as architecture and are completely independent in so far as they are not only visually, but also conceptually elusive. This circumstance, together with the lack of affiliation to a communicative system within society, makes their artistic reception more difficult. Conservative, humanistic-oriented art criticism is hardly willing, or indeed in a position, to accept the extension of artistic potentials by technical development.

In recent times you have increasingly created location-specific installations for sites such as church spaces. What effects do you observe when your neither tangible nor clearly defined holographic images form an inter-relationship with the sharply contoured architectonic space?

In my laboratory activities I examined the interfaces between laser media and all conventional and technical media. At the time, it proved to be advantageous that the creativity during the production of holographic representations begins with the set up of the apparatus, the holographic camera. Such a camera has nothing in common with a technically compact photographic camera. Lasers, lenses, optical devices as well as cannibalised parts from video projectors and photographic cameras were arranged on a sturdy table and controlled by computers in such a way that my expectations were met or that newly arising options from calculated coincidences became visible. Thanks to the support provided by technicians, I was able to play out nearly all the possibilities that in my experience were offered by conventional media. The results of these investigations are the further development of multimedia recording processes such as holographic stereography - multi-dimensional image sequences in accordance with video, photo or film templates, or the further development of historical predecessors such as a light kinetics that is linked to kinetic object art from the middle of the last century.

With my focus on art in and on constructions, as well as on realisable projects in public spaces, I currently mainly use industrial products from the lighting, building and photographic industries. I work closely with engineers and together with them modify the materials that I use to suit my own requirements. Thanks to the continuously further developed materials, many of the visions and ideas developed in my earlier experimentation phase seem to have become implementable.

First of all, despite my previously mentioned Christian influences, my installations are not intended to be understood as a contribution to sacred art but as a contribution to the world of art that enters into a dialogue with the contents of the church as well as liturgical and architectonic positions. On the other hand, light is of course a central symbol of God, not only in Christian religions. Nothing is better able to portray the godly self-revelation, the appearance of God, than a representation that uses light as its central element, be it in painting or in the form of a technical application.

There are basically two possibilities for handling location-specific installations. The (museum) white cube or black box situation almost completely masks the surrounding area in favour of the object. The observer's perception is focused on the object.

However, in rooms as well as for exterior areas, I prefer the second possibility, namely the integration of the object into its surroundings. Designed light doesn't necessarily and exclusively require darkness. In many of my works, the seemingly intangible light application overlies the materially manifested surroundings or appears to form a background to it. Tangibly experienceable space and prismatic light phenomena pervade each other and enter into a dynamic dialogue that is governed by the changing light conditions.

In the case of the black box situation, the light effect is based on the static dialectic of light and darkness.

New qualities of light also enable more dynamic effect processes. They are the result of advancing technological developments within the field of photonics and in building technology. Examples include prismatic foils and special projection foils (which I also use) that mask the surrounding light and only react to the artificial projection light. For the use of my work with these media in architecture, this means that the light or the light art interferes with the architecture - playing with the surfaces and structures, supporting transpar-

ency or counteracting and countermining mass and building volume. The perception of stability is apparently, but only visually, called into question, and yet ultimately intensified.

The foils that I use are particularly effective in combination with glassed areas, windows, and facades. In addition they also enable the simultaneous aesthetic forming of the incoming lights and the visually aesthetic signal effect to the outside. An example of this can be seen in my 'Eyefire' holographic wall image that I completed in 2000 and which is to be found at the German Research Foundation in Bonn. The light-drenched conference room in the main building that was designed by Sep Ruf in the 1950s is a place where far-reaching decisions for the future are made. Through the addition of another building, the previously uninterrupted view from here of the Rheinaue and the Siebengebirge hills opposite became blocked by a 13 x 5 m concrete wall. The idea of restoring this view in a virtual sense with the aid of holography was only possible with prismatic foils, which were mounted onto mirrors and cover the wall area. The large wall mirror has two functions: firstly the reconstruction of the hologram (through transmission and mirroring of the reconstruction light falling from the front) and secondly the visual opening up of the space. The hologram appears to float between the buildings. In addition it is reflected in the window fronts of the conference room opposite whereby the shape and colour fluctuate through the changed perception geometry of the observer. The hologram and its mirror image exceed the boundaries of a pure wall image to become a complex body of light that defines the whole building.

An interesting aspect of holography is that the material image carrier and the position of the virtual image in the space are not identical. How do you deal with this phenomenon in your work?

The image carrier and the image form the hologram yet the image appears at a different place in the space from the image carrier. This is certainly a repeatedly spectacular sight, particularly with a reconstruction using laser light. This is also the phenomenon that has led to much fantastic yet unrealistic speculation about holography. If it also became possible to reliably provide the technical conditions that exist in the laboratory for use in larger productions, then great holographic light installations as an application in and around architecture would be conceivable - spaces such as those described by Stanislaw Lem in the novel 'Transfer' or M.C. Escher in his 'impossible pictures' and metamorphoses.

It is actually already possible to achieve similar effects from combinations with mirrors, optical lenses and projections. However, from my experience, I know just how difficult it is to convince clients of this capability. On many occasions my designs were rejected by would-be clients who doubted the feasibility of my proposal.

When light touches human skin, it produces what initially appears to be an intensive yet superficial aesthetic effect. However the effects of this contact go far deeper, penetrating beneath the surface. In biology and medicine it is precisely this non-visual, non-superficial effect that is essential for life. Can you draw parallels from this aspect to your own work?

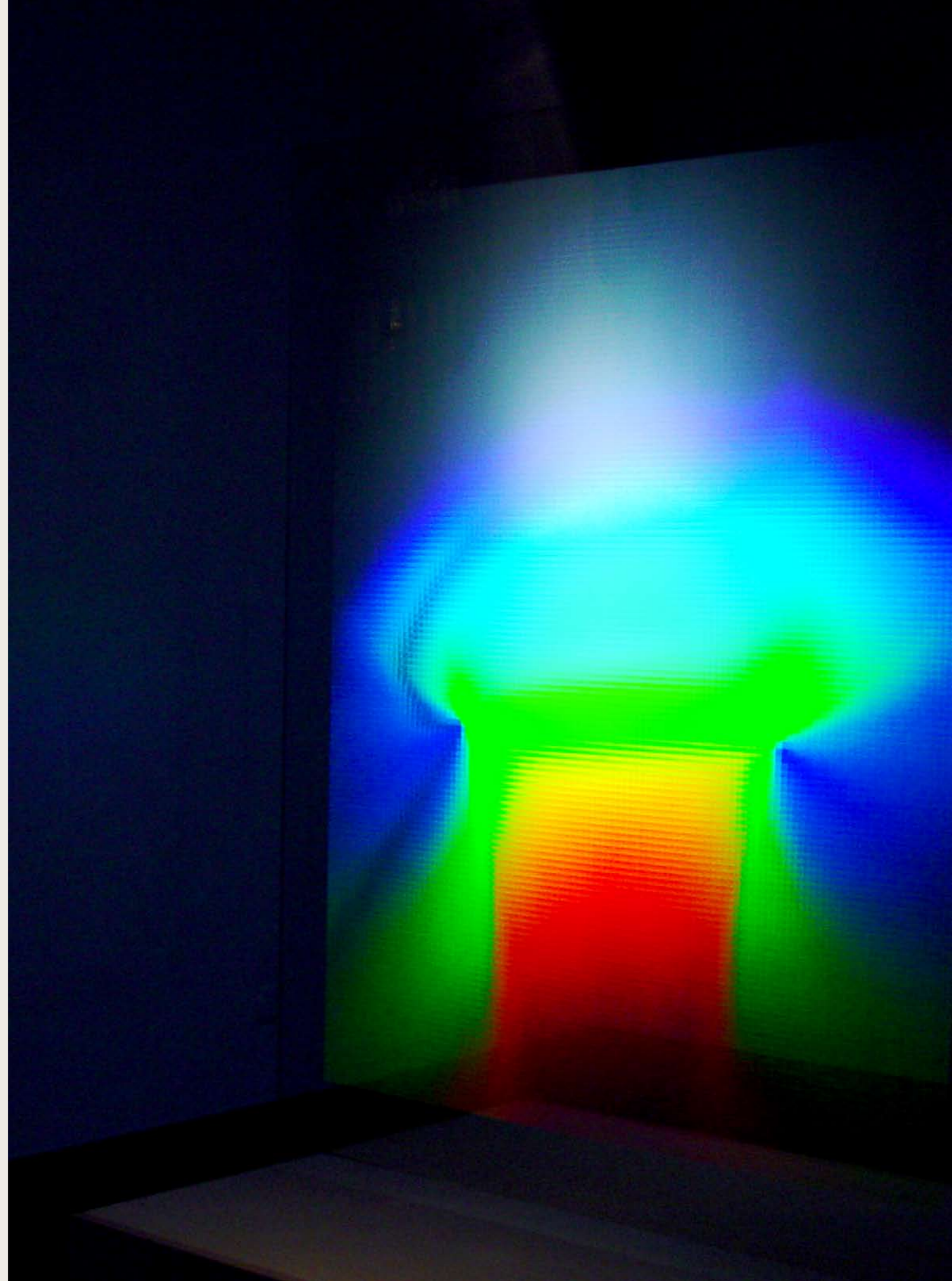
For the graphic artist, the visual effect is of course constitutive but it is certainly not superficial. I am aware of the effects of light on the mind and its importance to our health. However, all my mentioned experiments with and about light were limited to its effects on our perception. We seek out and long for the sun if we have to go without it for a long period of time.

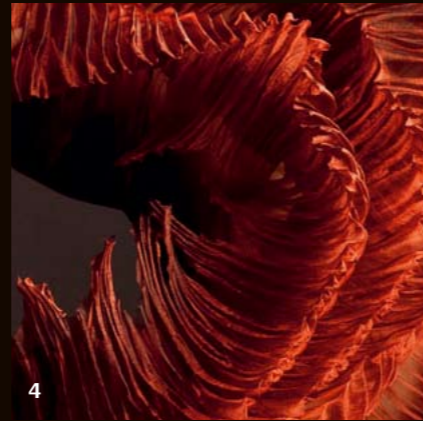
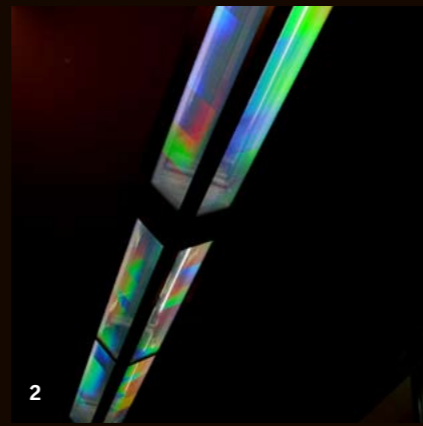
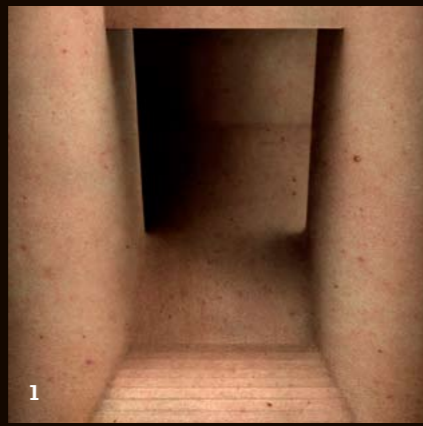
We feel good in light. I too want to immerse people in pleasant light, whereby the beneficial effect is not a purely emotionally process but also a result of a spiritual and meditative encounter.

My 'Spero Lucem' work was commissioned by the Educational Institute of the Archdioceses of Cologne and presented to the St Agnes church parish in Cologne on permanent loan. For its part, the parish agrees to lend the work to other churches in the archbishopric. 'Spero Lucem' then becomes the motive for numerous different educational activities, seminars, meditations, discussion groups etc. in which I am occasionally also involved. The mostly positive through to euphoric reactions to the light sculpture remind me that the actual, idealistic aim of education is the state of happiness. In my case, light or the way in which I design and present it, have possibly made a contribution towards this objective.

**Opposite Michael Bleyenberg:  
Spero Lucem, 2002/03**  
Instead of using paint on canvas, Michael Bleyenberg 'painted' this portrait of a cross with light. In contrast to classical altar images, 'Spero Lucem' (I am hoping for light) intervenes actively in the space. How it is perceived depends on where the viewer is standing.

PHOTO: MICHAEL BLEYENBERG

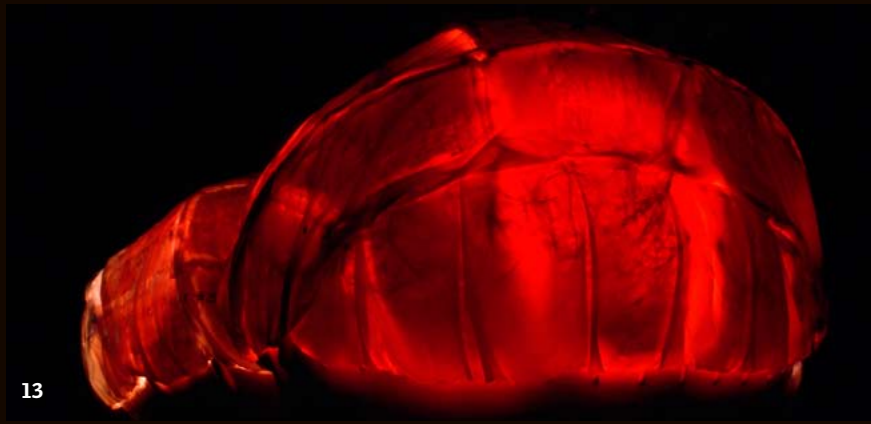




PHOTOS: 1 - AZIZ + CUCHER, 2 - MICHAEL BLEYENBERG, 3 - GARY SCHNEIDER, 4 - JEPPE GUDMUNDSEN-HOLMGREED, 5 - WERNER SOBEEK ARCHITECTEN + INGENIEURE,

PHOTOS: 6-7 - MITSUMASA FUJITSUKA, 8 - DAVID MAISEL, 9 - REINERUNG, HERZOG & DE MEURON, 10 - EDUARDO HEBER, 11 - REINERUNG, HERZOG & DE MEURON, 12 - MICHAEL HEINRICH

- 1. Aziz + Cucher: Interior #2, 1999
- 2. Michael Bleyenber: New Burlington Flare/Three Prisms, 2006
- 3. Gary Schneider: Helen, 2000
- 4. Thea Bjerg: Zig Zag Scarf, 2006
- 5. Werner Sobek Architekten + Ingenieure: Stadium roof in Hamburg-Rothenbaum
- 6. Kengo Kuma & Associates: Museum of Hiroshige Ando, Batou, 2000
- 7. Kengo Kuma & Associates: Chokkura Plaza, Takanezawa, 2005
- 8. David Maisel: The Lake Project 9831-2, 2002
- 9. Herzog & de Meuron: Elbphilharmonie, Hamburg, 2007- (interior)
- 10. Baumschlager Eberle: Eco secondary school in Mäder, 1998
- 11. Herzog & de Meuron: Elbphilharmonie, Hamburg, 2007- (outside view)
- 12. Hild und K. Architekten: Facade renovation in Berlin, 1999



13

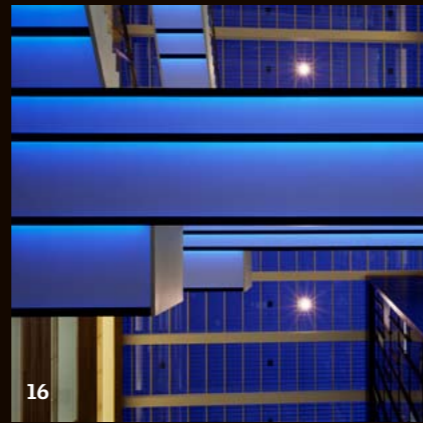


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13/17. ILEK/University of Stuttgart, Markus Holzbach: 'paul' pavilion, Stuttgart, 2004  
14. NOX / Q.S. Serafijn: D tower, Doetinchem, 2004  
15. Herzog & de Meuron: Forum building in Barcelona, 2004  
16. Steven Scott: Seventy-Seven, 2006



15



16



17

Future Homes  
When new development is wanted,  
one could ask oneself why.

PHOTOS: 13/17 - MARKUS HOLZBACH, 14 - NOX, 15 - JAKOB SCHROOF, 16 - ADAM MORRIS



Every photograph is the beginning of  
a story, the first frame of a movie.

Wim Wenders, *film director.*

# IMAGE AND REALITY

*Erich Kettelhut: Draft sketch for film scenery for 'Metropolis'*  
Deftly employing dramatic light and shadow effects, this sketch portrays the hypertrophic architecture of 'Metropolis', the city in Fritz Lang's well-known film of

the same name. Controlled from a command center in the new tower of Babel, the city can be seen as a pessimistic counterpart to the almost contemporaneous, rational urban visions of Le Corbusier and other architects.



DRAWING: DEUTSCHE KINEMATHEK MUSEUM FÜR FILM UND FERNSEHEN / ESTATE OF ERICH KETTELHUT

By Ivan Redi.

Architectural drawings are a versatile medium: they can be the image of a future reality, or simply a hypothesis, they can inspire us to rebuild the world radically, or to buy our own home. But whatever the case, they will remain unrivalled in the architecture of the 21st century. For, says Ivan Redi, drawings help us to rethink our ideas about the two phenomena for which architects, and architects alone, will continue to be responsible in future: space and light.

IT IS DARK. We can't see anything. Suddenly, a light goes on, a beam of light, and we can make out the actor on the stage – it is King Lear. Just as Goethe said: "An old man is always a King Lear," I believe that nowadays the architectural drawing is always a King Lear. Lear's patriarchal domination led him to be unjust to his youngest daughter and finally to his demise. Cordelia only says to him that she loves him exactly as a daughter should love her father – no more and no less.

The drawing dominates unrivalled in architecture, even in the 21<sup>st</sup> century. When we go to the theatre, we allow ourselves to be enchanted. We enter into a kind of pact that we will allow ourselves to believe in imaginary things. But we stay sitting in the dark and watch the performance passively. The artificial view, or central perspective, is the only one that informs us about this 'reality'. In the reality outside a theatre, however, the intrusion of bodies into a controlled architectural order is unavoidable (for example, the entrance of a person into a building is an act that upsets the balance of accurately ordered architecture). Here, architecture is an organism that interacts constantly with the user, having a body that rebels steadfastly against the existing architectural rules. In very few cases can we record or anticipate this human behaviour. The functional procedures offer room for negotiation, but many things can neither be planned nor expressed in the classic architectural drawing. There will, for example, be more and more so-called 'on-demand' rooms in the 21st century, in other words, open environments that adapt themselves to the user and to his or her wishes by means of 'customisation'. In addition, rooms will be enriched with new technologies and media, whereby reality and virtuality will merge together on the principle that they are one and the same. In cases like this, we refer to 'augmented realities'. In the world of the future, the central perspective and orthographic projection will, therefore, be entirely replaced by the multi-perspective. This allows us to explore rooms freely and actively and to experience them at a visual level. The drawing, on the other hand, only allows us to anticipate the rooms and to imagine what they might be like.

It is absurd to use a two-dimensional medium to describe a multi-dimensional world, including events that cannot be determined in advance, and to try and recognise any element

of truth whatsoever in it. An image cannot – to paraphrase Wittgenstein – stand outside itself. It is not possible to tell from the image alone whether it is true or false. "An atomic fact is thinkable" means: we can make a picture of it for ourselves. What is thinkable is also possible. We cannot think anything illogical, otherwise we would have to think illogically. Despite this, there is not an a priori true picture. The picture is a model of reality, and no more. It communicates by means of a possibility, it inspires the imagination and we think: "aha, it could look like that". We can only be interested in the architectural drawing exactly and exclusively in this context, no more and no less.

'CARCERI' AND ITS CONSEQUENCES:  
PIRANESI'S LONG SHADOW

In the theoretical thinking of Piranesi, which was by no means static, the artist recognises the duality of progressive thinking that arises from the conflict between rationality and feeling as a criterion that he applies to evaluate the works of the past and the present and denote them as 'vero' or 'falso' (true or false). Giovanni Battista Piranesi is considered one of the most important artists in the field of etchings and vedute. Some of his works, in particular the Carceri (pictures of prisons) and Campo Marzio (a metaphor for the universe that had already been hinted at in the Carceri), are still of great importance today. Many of the pioneers of modern film, Sergei Eisenstein, the sculptor Peter Weiss, authors Hans Enzensberger and Erich Fried, and also comic authors like François Schuiten and contemporary architects Lebbeus Woods and Daniel Libeskind used the imaginative world of the Carceri as a basis for their own works. There can be hardly anyone who is interested in architecture who has failed to come across Piranesi. If we put aside all the emotional reactions inspired by his works, the important aspect here is a systematic criticism of the concept of space using the instruments of visual communication. Eisenstein considered in his writings whether it might even be possible to detect chiaroscuro in Piranesi, which is not formally possible due to the limitations of etching techniques. It is, however, possible, if one investigates Piranesi's works closely with regard to spatial composition, the play on light and shade and



**Opposite**  
**Giovanni Battista Piranesi:**  
**Carceri d'invenzione, 1745**  
**Panel VI: The smoking fire /**  
**Il fuoco fumante**  
Piranesi's etchings of the  
'Carceri' (prisons) still inspires a  
multitude of artists and archi-  
tects. Their impressiveness is

probably thanks to Piranesi's  
publisher, Bouchard, who had  
the 16 original panels, which  
tended to be on the bright side  
as far as the colouring was  
concerned, reworked in 1761  
in order to intensify their  
dramatic effect through the  
use of sharper contrasts.

the creation of an engrossing atmosphere. His drawings are like a stage setting that delivers an acrobatic performance and draws the observer into a virtuoso experience of space.

On the other hand, the strange combination of opulence and severity in Eisenstein's designs produced images of incredible effect and bizarre beauty – a reflection of the events in paintings and wall frescos gives a mythic dimension to his film work.

#### FROM 'GOLEM' TO 'METROPOLIS': ATMOSPHERIC ARCHITECTURE IN FILM

The world of film has always provided architects with a welcome opportunity to play out their ambitions with fantasy and create illusions. With manifestos and utopian drawings, revolutionary new concepts have been thought out and presented that are free of the economic and structural limitations that are usually imposed by builders and building authorities. The 'expressionist' films, for example, were usually purely studio productions with clever lighting effects and complicated film decor that excluded all elements of coincidence and only permitted things of psychological importance. Daylight and sunshine were done away with, in order to exclude every natural or apparently natural condition. Even when architecture from real locations was used, it had to remain no more than a mere backdrop. When placed under an expressionist composition of light, image and motif, otherwise unspectacular functional buildings and softly romantic ruins appeared to be places of impending doom. They were 'atmospheric architecture', exaggerated by the magical 'sfumato' lighting. The imagery of the scenography was sometimes so reduced that the dynamics and light modelling of the image composition built throughout on the principle of expansion and contraction of light and dark Valeurs, and one really can speak here of 'abstract' architecture. The viewer is lulled into a dream by the scenography and light. The light has precedence, the objects do not have their own form, rather a form is bestowed on them by the light as it models them. Only the light exists, consequently the more an object identifies with the light, the fuller it appears, as a light source or mirror.

Bruno Taut, too, was very taken with the medium of film, and particularly with its quality as a collective work of art. He

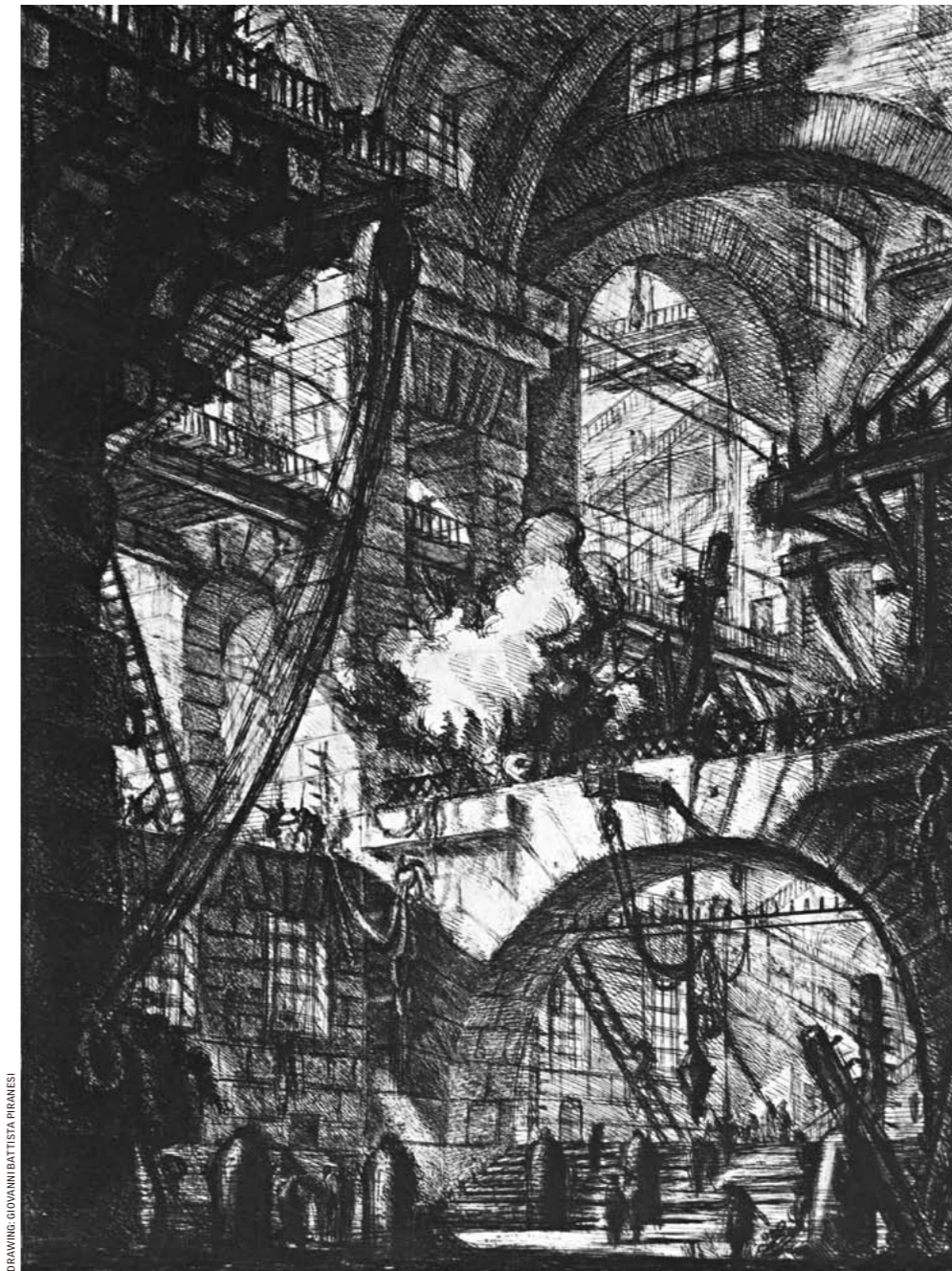
wanted at least to live out his visionary plans on celluloid as an 'ersatz' for their material impossibility in reality. Cinema offered the opportunity to bring together everyday life and fantasy, reality and utopia, even if only for a short time. In the architectural urban symphony 'Der Weltbaumeister', he dispensed entirely with plot and character and dealt only with 'the theme of the change and transience of fantastic architectural forms'. His film scenario consisted of more than thirty charcoal drawings with wide graphite strokes and dramatic lighting effects on a black and white contrasting screen. Although the epic 'Weltbaumeister' was never made, Taut's commitment to film was strong, and his influence had a lasting effect. Coop Himmelb(l)au and composer Jens-Peter Ostendorf staged the play in 1993 as an opera, as part of the 'Steirischer Herbst' festival in Graz.

Hans Poelzig's interest in film was about contemporary with Taut's, but was more productive. The film architecture for Wegener's *The Golem*: how he came into the world was true 'handiwork' with numerous effective horror effects that drew the crowds more than the esoteric attempts of other filmmakers did. Also, Poelzig's eruptive medieval nightmare had nothing in common with the rather naive gothic utopia of the grail-seeking romantics surrounding Taut, who paid homage to a crystal mania of illuminated domes, crystal palaces and crystal world buildings. Poelzig's architectural masses, earthy and expressionistically distorted, were the exact opposite: a kind of anti-utopia. Not only did he attempt to apply the habitus of an expressionist image onto a building, he also portrayed the internal life of the architecture of a gothic dream.

In this connection, Fritz Lang's 'Metropolis' must also be mentioned. This film shows extremely subtly how a 'supertown' is overturned, becoming a prison of skyscrapers, and exposes the capitalist skyline as a new tool of oppression by confronting inner conflicts. What is significant here is how the architectural forms are divided into each social language of class, as the 'top' of the city of the future is made exclusively for the rich. Beneath it lies the city of the plebs, and right at the bottom is the underground 'factory city', which guarantees the wealth of the 'upper city'. Modern technology appears here as an instrument of domination and suppression. The symbolic language is absolutely hybrid, almost ambivalent. On the one hand it is related to classical public buildings, on the other it

"Piranesi's drawings are like a stage setting that delivers an acrobatic performance and draws the observer into a virtuoso experience of space."

Ivan Redi



DRAWING: GIOVANNI BATTISTA PIRANESI



refers to the megalomaniac urban planning utopia of the Italian futurist Antonio Sant Elia (Citta nuova, 1914), while the cuboid houses of the sleeping city with their homogenous windows and purified prismatic shapes evoke aspects of a 'Neue Sachlichkeit'. It would appear that Lang wanted to subject not only the human figures, but also the architectural form to a diabolical dialectic between good and evil.

SHOWING, SUGGESTING, OMITTING:  
THE INFORMATION CONTENT OF DRAWINGS

In order to explain better what I mean here, I will use a comparative example, with Gottfried Böhm's design drawings from the church in Neviges and the comic 'Silent Night' from the 'Sin City' series by Frank Miller. Both are black and white drawings with extreme contrasts, indeed there are almost no shades of grey at all in Miller. It is only possible to see the contours and these are reduced to a minimum. The information conveyed by the pictures relies on a concentration of information. The image inspires the imagination, one can imagine the basic delineations of space and the rest is interpretation. In art or comics, this strategy works without any difficulty. In architecture, on the other hand, it is more difficult, since it is about a personal drawing with an autobiographical character – a character that is difficult to judge because it only reveals the artistic intention. Even the 'spatial' poster-like images of Archigram, which were closely related to pop and comic culture, do not provide any more information about simulated space. The 2D-collages, about which the viewer may enthuse spontaneously or arbitrarily (there are no parameters for decision), or indeed not, remain adhered to the paper. These drawings can only be understood as concept diagrams.

If, however, we assume that it is also possible to think with the eyes, and if we consider architectural drawings as a medium for communicating and simulating future environments, and for testing an idea before it is realised, this is not enough. Apart from aesthetic ideas (sketches and drawings) and functional ideas (a technical plan, floor plans, cross-sections and views), we have to know what our actions actually result in. Do we not expect too much of a drawing here? To return to the comparison with King Lear, we perhaps have to



**Opposite (top) Gottfried Böhm: pilgrimage church in Neviges, 1965** Almost two-dimensional and greatly simplified but nevertheless clearly recognisable, Gottfried Böhm illustrates the cubature of the church architecture with its expressive fold structure roof. Powerful contrasts of light and shadow are characteristic of the charcoal drawings of the winner of the Pritzker prize in 1986.

**Above & opposite (bottom) Frank Miller: Sin City, 1991** Like Böhm, Frank Miller also succeeded in implying space, volume and structures with white and black areas. The drawings, some of which are gloomy and foreboding, reflect the content of the comics that portray the criminal underbelly of large cities.

recognise that we can only love this medium as a draughtsman can love his tools – no more and no less – and that we have already reached the limits of this method of expression. We must ask ourselves what new instruments are needed in the 21st century to create the world of tomorrow. This is an inherently conceptual question and not a stylistic one. What would a Piranesi do today if he had the latest technological tools at his disposal?

In Sydney Pollack's documentary about Frank Gehry, Gehry talks about his own house in one scene, and the angled, overhead glazing in the kitchen. The glass continually reflects different things, like the cars driving past, then trees, clouds, a starry sky, depending on the time of day and year, or the weather, or just whether it has been cleaned or not. Gehry finds it particularly exciting during the evening of a clear night when the moon suddenly appears in the 'wrong' place. A little later, the reflection of the moon appears in a different place, and so on, until nobody can tell what is 'right' or 'wrong' any more.

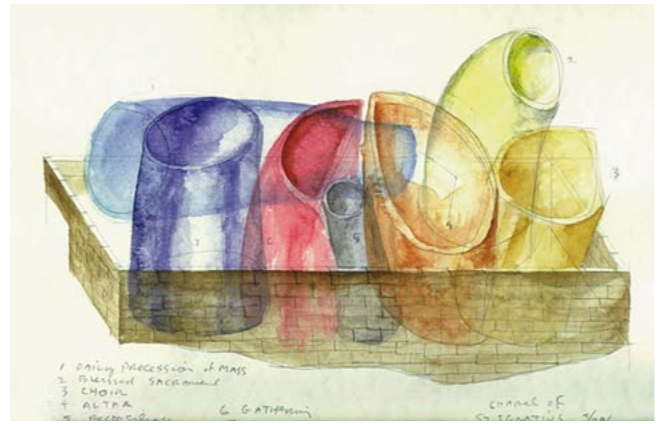
These reflections are a perfect example of displacement: things appear in a broken form in places where they should not really be. If the 'thing' is daylight, this game is even more unpredictable. Reflections are entropies that come and suddenly disappear again, unexpectedly, since they themselves are dependent on non-linear systems that are difficult to understand. Systems like, for example, the weather or the structure of material surfaces and textures. The latter can practically never be regular, due to inaccuracy in their construction or later to wear and tear. Even photography has a hard time here, since the 'right' view depends on the right moment, and as soon as the shutter is released, what was previously objective becomes subjective and the authenticity is lost. When you then also consider the possibilities offered by a photographic laboratory or digital image processing, photography is essentially a designed view and designed shade, communicated through picture segments made for us by somebody else.

LIGHT, SPACE AND IMAGINATION: THE DRAWING AS A MODEL

The American architect Steven Holl endeavours to create architecture with light – his project for the Chapel of St. Ignatius in Seattle is acknowledged to be a successful example of how

**Right 07 Steven Holl: Sketch of a concept for the St. Ignatius Chapel in Seattle**

Seven bottles of light in a stone box – This is how Steven Holl describes his draft concept for his chapel on the university campus in Seattle. In this watercolour, he illustrates its approximate volume, while intimating the functional layout of the building.



DRAWING: STEVEN HOLL ARCHITECTS

daylight, materials and textures and also reflecting surfaces can be put to use. The guiding concept of the building is 'seven bottles of light in a stone box'. The metaphor of light is created with different volumes – starting with the roof, which has an irregularity that creates different qualities of light, and finally all coming together in a common ceremony. The only question is whether the watercolour drawing of Holl's design does justice to the actual complex interplay between space, light, shade and reflection that is achieved, and whether we can rely on experiences (even ones that can be measured or simulated) other than on personal and artistic ones.

In my opinion, we architects will only be responsible for two things in the future: space and light, especially daylight. This is the substance of our entire expertise, and we are unrivalled in this. I am expressing this a little polemically on purpose, since a precise explanation would go beyond the limitations of this text.

New computer technologies and rendering processes will be useful to us in this work. However, the simulation of light is not only the generation of a scientific picture, it also has artistic requirements. Apart from looking at information of a technical nature, this tool can also be used to examine a design proposition and make it clear to an onlooker. It would be wrong to assume that renderings are simply surface painting. Pictures, images and drawings do not simply reproduce reality, they are the result of a simulating process. The image is not a portrait, but a model, illuminated by virtual light sources, whereby parameters are determined using complex procedures.

Pictures are always interpreted and read differently, and we seldom think with the eyes. It is more common to search for a feeling or atmosphere, in other words for a completely subjective manner of observation. This is a challenge for pictures that are supposed to have a scientific character. Scientific pictures are the product of a long and complex production and selection process with many processing stages, decisions and contingencies. In this way, they are eventually able to part from the context of their making and take on their own reality. The impression that we have come up against an objective condition in the real world does not succeed until the experimentally created phenomena make 'sense' – in other words, when we succeed in creating a conformity between the theo-

retical expectations, the observed events and an understanding of the function of the calculating and evaluation processes used in this work.

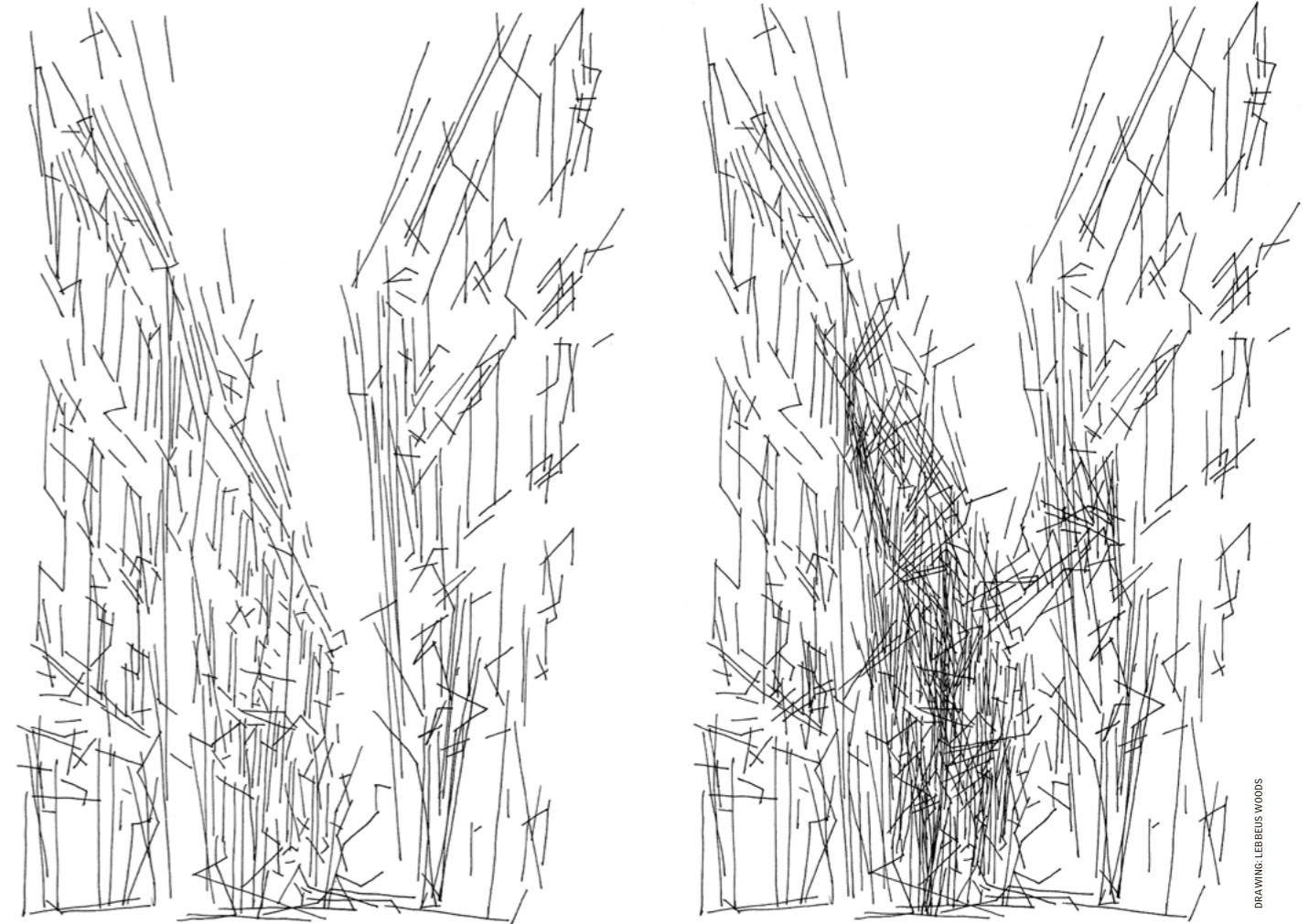
The pictures are tools that are used to work with. In order to serve their purpose, they should be seen as working instruments, even when the work only concerns the pragmatic and objective qualities of space. They should not be seen as an 'extra' that is used to explain a project or, indeed, make it more attractive. In the process of computer-based image generation, interactivity has proved to be a fundamental means of checking designs better and improving them, not simply for depicting them. The use of pictures here has proven to be a working process in which the computer and the human eye are integrated and which is, due to developments in image technology, moving towards a space of visual virtuality. If William Gibson's science fiction vision 'Virtual Light' comes true, we are heading for a future where optical sensation is created directly in the eye, without photons as bearers of light.

'Imagining' (creating ideas) and 'Imaging' (creating pictures) will then become one, but the final image will develop further when we learn to understand with the eyes and when we no longer read pictures in order to interpret them, but in order to simulate real or virtual environments and test their qualities. It does not matter here whether these are logically tangible or sensual characteristics. This means that the new drawing not only serves to depict planned, future worlds in an exact, technical and photorealistic way, it can also predict the artistically optional comprehension of spatial perception.

**Ivan Redi** co-manages ORTLOS ([www.ortlos.com](http://www.ortlos.com)) with Andrea Redi, an office for innovative architecture and interface design. He studied architecture under Günter Domenig at the Technical University in Graz and then worked with architecture firms, including Morphosis in Santa Monica, California. Ivan Redi is currently working on his dissertation on the theme of *New design methods in architecture* and teaches architectural design at the Technical University in Graz. He is also joint editor of the book *ORTLOS: Architecture of the NetWORKS* (published in 2005 by Hatje Cantz).

**Below 06 Lebbeus Woods: System Wien, 2005**

In his 'System Wien' (Vienna system) project, Lebbeus Woods interprets architecture as the "organisation of energy". With just a few 'fleeting' strokes, Woods shows the street space, the facades which frame it and even a suggestion of light and shadow.



DRAWING: LEBBEUS WOODS

## LIGHT SIMULACRA IN FILM



PAINTING: DYLAN COLE

By Eric Hanson.

From the first crudely-rendered stereometric shapes, computer graphics imagery has gone a long way to its present-day, hyperrealistic representation of textures and light. The driving forces behind this development have been computing power and advanced software algorithms. With the standardization of rendering tools, however, graphic artists are finding it increasingly hard to preserve their artistic freedom in the representation of light and shadow, as Eric Hanson explains.

LIGHT PLAYS AN essential role in all the arts, but none perhaps so centrally as that of film. From the classic film noir of *The Maltese Falcon* to the modern chiaroscuro of *Sin City*, light plays an integral role to the character and narrative of the film experience. As the rise of the recent digital revolution has deeply transformed how films are crafted, the art of synthetic lighting simulation has become a central artistic challenge. Digital film intervention was once solely two-dimensional in nature, assembling separate photographic sequences in an act of collage known as compositing. But the rise of three-dimensional rendering and animation technology has now fully integrated itself into the toolset of film, offering world and character creation totally synthetic and independent of the venerable tradition of live-action photography. French social theorist Jean Baudrillard's 1981 treatise on the dangers of the synthetic, *Simulacra and Simulation*, portends a nihilistic future where the value of the hyper-real displaces the foundation of the real, most recently inspiring the narrative thread of the *Matrix* franchise. Digital lighting is only concerned with approximating the nuance of complexity of real-world lighting, and will always be judged to those real-world standards without allowing a surpassing of it. A closer paradigm governing the synthesis of light is René Magritte's *Ceci n'est Pas Une Pipe*, a warning that representation should not be overvalued above reality. This issue is raised in the practice of digital lighting, where synthetic image-making is always subservient to the richness and complexity of reality.

From a technology standpoint, this has not always been a possibility. Earlier digital lighting methods were overly simplistic and severely limited in representing the full complexity of light. Early breakthrough computer graphics imagery (CGI) films such as *Jurassic Park* or *Terminator 2* began to reveal the stunning potential of computer graphics married to film, but the lighting was mostly directed to character rendition, though skillfully accomplished. Later attempts at creating all-encompassing photo-realistic worlds such as *Final Fantasy* fell short of creating a truly convincing reality, but were hampered by the technology of the time. This original form of CG lighting is termed *direct illumination* and is characterized by placing analogies of real world light sources such as spotlights and omni-directional bulbs within the 3D mod-

eled world. These lights could have physical properties such as decay, falloff, and color temperature, but as the abstracted light rays would hit a surface they would effectively die off at first contact. The limitations of such a scheme become obvious when lighting stops short and fails to interact with any successive surfaces. However, rendering computation time, always a concern with CGI animation, is optimal and held to a minimum with such an approach. Because of this issue of speed, much of the use of computer graphics in film has relied on this method of lighting, however primitive. Further, direct illumination was standardized by the rise and dominance of RenderMan in feature film work.

RenderMan has been responsible for most CGI rendering seen in modern film, and was created originally in the 1980s by Pixar of recent feature animation notoriety. Pixar at that time had the brightest minds in computer graphics and attempted to standardize the approach to 3D rendering. RenderMan was originally touted as striving to be the *postscript* standard of the 3D industry, but the lack of non-programmer accessibility prevented that from happening outside of high-end applications like feature films. Their most long-ranging impact on the industry, however, was the aggressive patenting of their solutions to many key rendering problems, such as motion blur or anti-aliasing<sup>1</sup>. As a result, many developers to this day cannot compete with the elegant and efficient technology that RenderMan offers. Even with the original primitive direct illumination limitations, RenderMan became the standard for feature film creative work, although now offering more contemporary tools. What this portended artistically is that with a more limited lighting toolset, CG lighting artists had to rely more on artistic intent to coax visually rich results from the software, much like a blank canvas open only to the artist's direct force or intentions.

If we study CG imagery of that time, we find CG objects lack the complex interplay of daylight with artificial sources, appearing simplistic and often synthetic. The holy grail of all lighting artists in visual effects is to create a seamless illusion of photo-realism, but effects work up to the end of the 1990's often displayed shortcomings, with the concept of film illusion lost. Visual effects work is often termed successful if it doesn't reveal itself to be such, as the viewer may lose emotional investment

**P.84** Matte painting creates convincing light strictly from the artist's eye and skill. New methods integrate 3D modeling, but artists still rely largely on a painted approach rather than rendering calculation.

**Opposite** Radiosity was the first global illumination solution, and provides the most accurate depiction of true light transport in architectural space.

with the film experience. Of course, some directors choose to make the visual effects work the central spectacle and basis of the film, with invisibility playing less of a role.

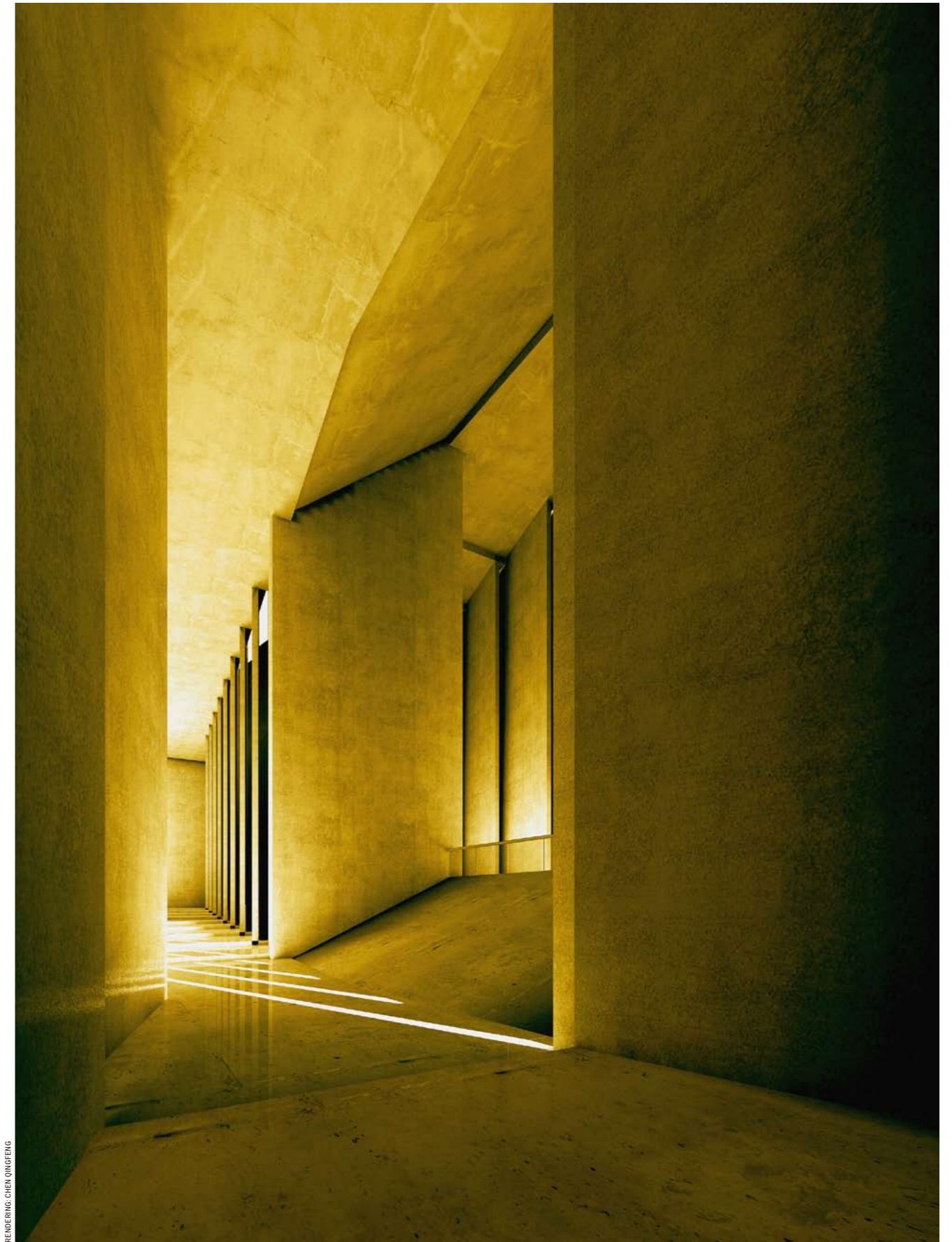
Progress in computer graphics is marked by the postulation of techniques that the computational power of the day cannot support, but later finds application once Moore's law allows computing power to ascend to a suitable level. Calculating physical light transport was considered in the early days of image synthesis, but was deemed too complex to implement at that time. However, one simulation method that was developed as direct illumination became entrenched was that of radiosity. Radiosity tried to fulfill the shortcoming of direct illumination by using laws of thermal energy as a basis for light transport. Heat transfer principles state that surfaces can emit, transfer, or reflect, and these are applied to light simulation in radiosity as an operative mechanism. Simply put, surfaces in a radiosity model are witness to all light passing through a space, and react accordingly. The surfaces in a radiosity model are subdivided into a mesh, where each grid unit effectively acts as a camera lens looking out to the world. In such a model, processing time can become burdensome, as well as demanding a large component of RAM to hold the calculations. The visual output from radiosity still ranks as one of the most accurate lighting simulations, allowing very close predictions of reality. Unfortunately, it was deemed too slow to use efficiently for film effects, but did make an appearance in the film *Casino*, where the Las Vegas Strip was restored to an earlier period. A wonderful exploration of radiosity was made by Kent Larson at MIT, as an arts grant to re-create the unbuilt work of Louis Kahn, and documented in the book, *Louis I. Kahn: Unbuilt Masterworks*. The intrinsically warm qualities of radiosity resonates richly with Kahn's masterful vessels of light in this beautiful treatise.

As direct illumination continued to pervade feature film visual effects, its shortcomings continued to be made up by the skill of the visual effects artist's eye and sensibility. What would normally be carried by computation would need to be artistically arrived at by painting in soft shadows and light interplay as imagined events. Radiosity showed the promise of computationally accurate light depictions, but was still unusable for film production. Some feature projects such as

*Final Fantasy* would even use overnight radiosity renders simply as a template to follow and mimic their appearance with direct illumination techniques. But it was the re-discovery of another early postulation that dramatically transformed the field, this time utilizing *ray-tracing*. Ray-tracing is one of the oldest mechanisms in computer graphics, and has long been used for proper reflection and shadow casting in addition to direct illumination. It uses a method to spawn and trace vector rays into a scene, allowing more complex light travel to occur than direct illumination. What was never originally attained with ray-tracing, however, was the calculation of light as a physically-based particle entity, as light acts as both microscopic wave and particle in reality. This idea gained hold in what is known as *Monte-Carlo ray-tracing*, and was resurrected from the research of the past by Marcos Fajardo's *Arnold* rendering code in the late 1990's. The initial images created by this renderer single-handedly transformed the field and created a revolution in CG lighting, affecting the entire field of 3D computer graphics to this day.

Monte-Carlo ray-tracing attributes its name to the fact that true micro-level particle light physics can never be fully computed, as the level of computation is unimaginatively vast, even for the simplest scene. Monte-Carlo technique is based on calculation of just a faint sliver of this complexity by initially using a Monte-Carlo statistical mean<sup>2</sup> to begin to reduce the weight, then using a comb filter<sup>3</sup> of that mean to yield the barest reduction possible of these complex interplays. Because light is ultimately perceptually qualitative in nature, the human mind will begin to believe a simulation as real that is otherwise very thinly based in reality. The Monte-Carlo technique is still computationally heavy enough to tax modern processors to their limits, but remains as a major breakthrough that allows real-world lighting to be arrived at solely by computational simulation, all within production-friendly render times.

Since the arrival of Arnold, a bevy of Monte-Carlo renderers have appeared in the field, and traditional direct illumination technique has now been relegated to second seat. Global Illumination, or GI as it is known, is now a current focused research topic in CG rendering, with many breakthroughs occurring regularly. Many doors previously barring photo-realism are now wide open, with GI allowing a multi-



RENDERING: CHEN QINGFENG

- <sup>1</sup> anti-aliasing: A smoothing of jagged artifacts common in computer graphics.
- <sup>2</sup> Monte-Carlo statistical mean: A common bell curve used to represent occurrences.
- <sup>3</sup> comb filter: reducing data complexity by repetitively sampling thin slices of values over a length.
- <sup>4</sup> flags: In lighting, a piece of fabric used to contain the spread of light, used for dramatic purposes.

tude of complex light interactions and phenomena. Complex effects ranging from the subtle internal light focusing of glass to accurate skylight shadowing and color are now commonplace, and have significantly increased the persuasiveness of CGI in film. Characters such as Gollum, King Kong, or Davy Jones are now legitimate substitutes for real actors, and this can be largely attributed to the usage of GI rendering, among others. One of the most exciting developments recently is the rise of “unbiased” rendering, light simulation that accepts little compromise and is based on the true spectral waveform physics of light. One of the forerunners of this approach is Maxwell Render, which creates images truly indiscernible from real world photography. Indeed, the Maxwell artist acts more as a photographer would, with all real world lighting techniques valid once again, such as flags<sup>4</sup>, diffusers, and gobos. Light can be refracted into a spectrum of component color, emit exact color temperatures, show the scatter of complex skylight, and respond to the aberrations of a real glass lens. Using a bracketed series of photographs of a mirrored sphere, lighting can be captured from a real location in full dynamic range and integrated seamlessly with CGI with a technique called image-based lighting.

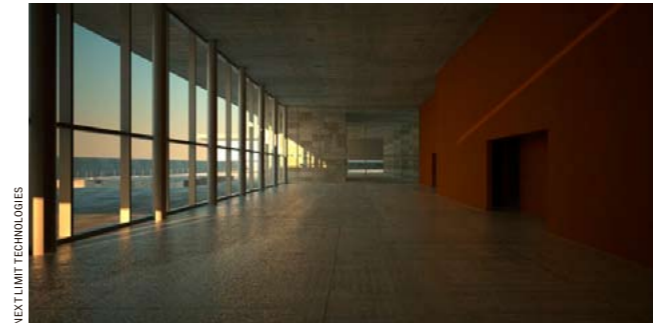
Like any new paradigm-changing technology, the positive advantages are unquestionable while also destroying long-standing tradition in the process, in this case artistically-driven direct illuminating practices. What was once the province of artistic skill and intent is now simply mechanical computation, with two lighting artists arriving at the same result given the same mission. Prior to GI, two artists would yield two individual results that reflect their eye and understanding of narrative lighting. This ‘lighting by intent’ still lives on the feature animation world, however, where stylization and feature identity are central to the work. For photo-realistic visual effects, though, the GI shift is irreversible. Photo-realism is always the goal, and artistic variance could create problematic inconsistency. Still, there is a sense of something lost, not unlike the departure of classic Hollywood trades such as the use of miniatures or classic matte paintings. In the end, however, this is the classic struggle of the artist either at odds or in harmony with his tools, not unlike the early reluctance to classify photography as art – who creates the image, the tool

or the artist? As with the entire spectrum of art, it is the artist that drives the creative unfolding and exploration, driven and informed by his sensitivity and skill, no matter how technical the tools used. The real question to be asked of visual effects in film is whether it has furthered and enhanced more powerful emotional storytelling, an essential issue non-technological in nature. Are the films better for it? Whatever the answer, the power and mysteries of light will always play a central role in film or any future media, remaining essential to conveying human emotion and experience.

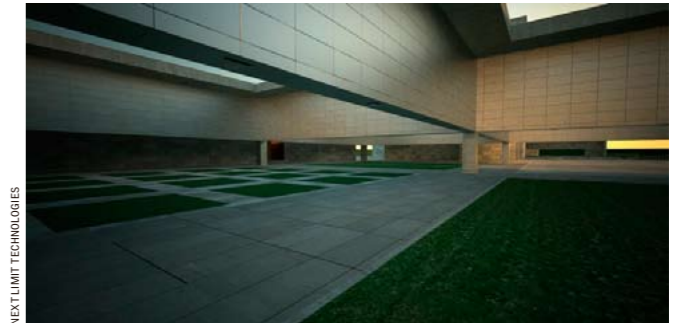
**Eric Hanson** is a visual effects designer specialising in the creation of digital environments and effects for feature films. Trained originally as an architect, Mr Hanson established early 3D visualisation studios for large architectural firms including The Callison Partnership and Gensler and Associates. After transitioning into feature film visual effects, he has worked with leading visual effects houses such as Digital Domain, Sony Imageworks, Dream Quest Images, and Walt Disney Feature Animation. His work can be seen in *Stealth*, *The Day After Tomorrow*, *Cast Away*, *Hollow Man*, *Atlantis*, *Fantasia 2000*, and *The Fifth Element*, as well as many special-venue films. Currently, Eric Hanson is leading the visual effects curriculum at the University of South California’s School of Cinema/TV.

**Top left & right** Maxwell Render allows highly realistic depictions of real-world materials, from refractive glass to carbon fiber.

**Bottom left & right** The Monte Carlo ray-tracing methodology used for global illumination allows rich interplay of light by calculating the transport of photon light particles in a highly culled and optimized methodology.



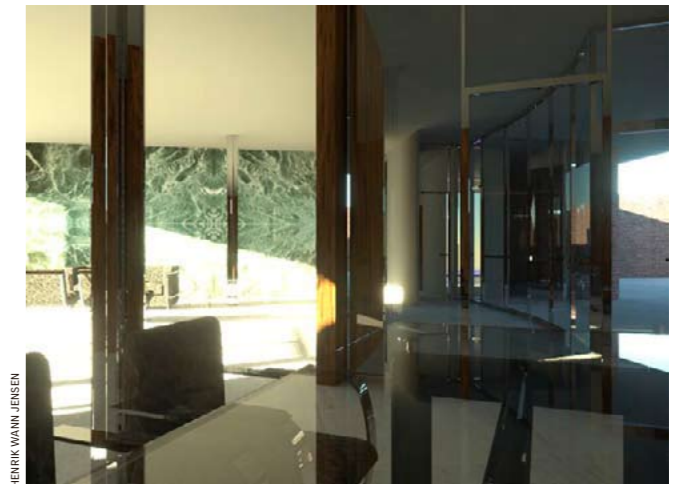
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HENRIK WANN JENSEN

# WITHIN HEAVY WALLS

Museum in Brie-Comte-Robert



By Jakob Schoof.  
Photography: Adam Mørk.

A structure with no claim to eternity; that is what the 'Heritage Interpretation Centre' set up within the castle of Brie-Comte-Robert was intended to become: lightweight, transparent and easy to take down again in case of doubt. Behind its larchwood facade, the museum harbours halls full of daylight in which the finds on display, the reconstructed castle walls and the modern wooden structure stand beside each other as equals.

About 30 kilometres southeast of Paris, in the midst of the hilly landscape of Brie, stands a monument that is recorded in the fewest of guide books and yet which, if one is to believe the historians, is a very model for many of France's medieval castles. The Château de Brie-Comte-Robert, a square structure with round corner towers, is just a few steps away from the market square in the centre of the small town bearing the same name. As they did hundreds of years ago, two bridges today lead visitors over a broad moat to the two castle gates, which are protected by square towers. This opening to two sides and the resulting corridor-like character of the castle is, as far as we know, unique in the region.

The castle was built in the late 12th century by Robert I. de Dreux, lord of Brie and brother to the French king Louis VII. In 1982, not much remained of his building except a few remnants of the approximately 2.3 metre thick limestone walls. Since then, however, the Amis du Vieux Château, an association of voluntary workers, have recorded some remarkable achievements: a large part of the castle wall, along with all eight of its

towers, has been rebuilt. Moreover, excavations in the inner courtyard have turned up numerous wall fragments from former living quarters. The excavators have been supported in their endeavours by a large number of private and public sponsors, who, in 2003, also provided the wherewithal for the association to undertake its most ambitious project yet: the building of a combined operations and exhibition building, or, in official French, a CIP (Centre d'interprétation du patrimoine). The intention was for the building to accommodate not just an exhibition hall, but also rooms for museum education activities, offices and a large meeting room for the excavation volunteers.

The plans for the 400 m<sup>2</sup>, EUR 725,000 new building were drawn up by local architects Semon/Rapaport and museum designer Lorenzo Piqueras. As is always the case when something new is to be created within historic walls, the national authority for the preservation of historical monuments (ACMH) also had a substantial say in the proceedings. Its Chief Architect, Jacques Moulin, drew up a specification document for the project that demanded a tim-

ber structure – partly because this material would differ clearly from the old walls and partly because a wooden structure could be taken down again relatively easily to accommodate later, more extensive excavations. Aesthetic considerations also played a part in Moulin's preference for wood: "The medieval monuments that come to our attention are often like mussels, where the only part remaining is the shell. All the lighter structures have disappeared. [...] It therefore seems desirable to me to re-establish this diversity of materials in the buildings that we restore, as this was a characteristic trait of western architectural design."

In the end, it was also its low weight that tipped the scales in favour of a wooden structure: the site of the building, in the northern corner of the castle, has not yet been excavated. In order to protect the artefacts potentially still hidden there, the ground could be burdened neither with heavy structures nor with heavy construction equipment. The museum was therefore built as a pure frame construction and based on flat individual footings that rest on the natural soil. Flat is also the word for the

**P.90–91** Not visible from the outside, the 'Centre d'interprétation du patrimoine' on the inside lies directly against the castle's limestone walls, which are 2.3 metres thick in places. The exhibition halls are also characterised by large window areas.

**Right** The almost square castle, with its four corner towers, is in the centre of a town called Brie-Comte-Robert. Since 1984, the 'Amis du Vieux Château' have been renovating large parts of the castle walls.



building as a whole: the regulations of the preservation authorities required that its height remain lower than the newly-erected wall coping. Semon/Rapaport designed an L-shaped building with a monopitch roof that seems to lean against the castle walls to the north and east and opens out to the mid-day sun to the south. The roof structure is held up by round columns made of Douglas fir, some of which are tied back to the castle wall with tension rods. Some of the display cabinets on the inside of the museum are also set back into the reconstructed rear wall. The timber design meant that large parts of the flooring, walls, support beams and roof structure could be prefabricated and that on-site construction work could be completed in just three weeks.

Access to the museum is at ground level, via a broad wooden platform erected at the front of the building. The south facades reflect the usages of the individual rooms – and the architects' wish for a museum that, in stark contrast to the 'black boxes' and 'white cubes' usually found elsewhere, would make visitors aware of the passage of the sun around the building.

At eye level, the facade is mainly closed and can be used for hanging exhibits. But Semon/Rapaport gave the exhibition hall three flat strip windows allowing the visitor a glimpse of the outside. One is sited immediately above the floor, a second just below the suspended ceiling and the third is integrated into the roof of the museum in order to provide daylight for the rear third of the exhibition area. On a sunny day, these windows allow a series of dapples of light to wander across the rough limestone walls, every now and again throwing individual exhibits into relief.

The historical artefacts, the reconstructed masonry and the lightweight new construction are thus forever being presented in a new – and forever different – light. For the clerestory strip, the architects used roof windows. "This choice allowed us to keep costs down in comparison with specialist aluminium glazing and, what's more, allows us to ventilate the space," explains Jean-Claude Semon. A comfortable climate without temperature peaks occurs almost automatically in the museum: in summer, the massive castle walls act as an ideal temper-

ature buffer, keeping the building from overheating; for the winter, a low-temperature radiant heating system has been installed in the ceiling of the hall.



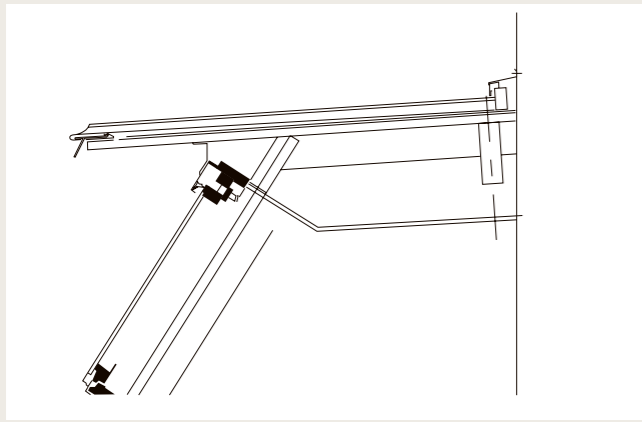


**Left** The exhibition and administration building is built completely of wood. Apart from the foundations, a fair-faced concrete wall at the entrance is the only non-timber part of the building.

**Below** High and low window strips allow light to enter the exhibition hall. The facade surface between these two strips can be used for exhibits inside and is only occasionally interrupted by windows.

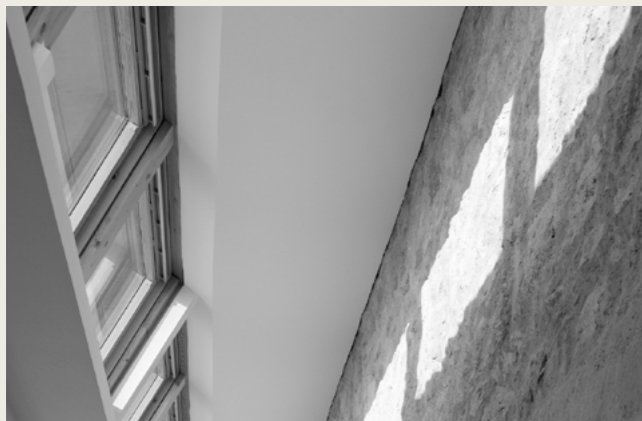
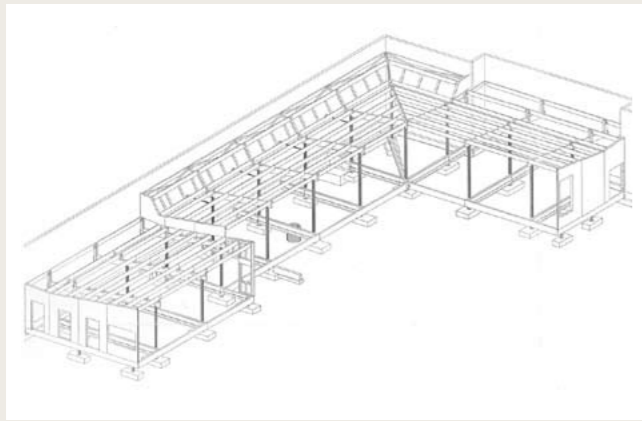
**Opposite** The third window strip consists of roof windows and illuminates the rear part of the exhibition area.





**Facts**

|  |   |
|--|---|
| Clients                                      | Commune of Brie-Comte-Robert                |
| Architects                                   | SCP Semon Rapaport,<br>Brie-Comte-Robert    |
| Exhibition design                            | Lorenzo Piqueras                            |
| Academic concept and archaeological research | Amis du Vieux Château,<br>Brie-Comte-Robert |

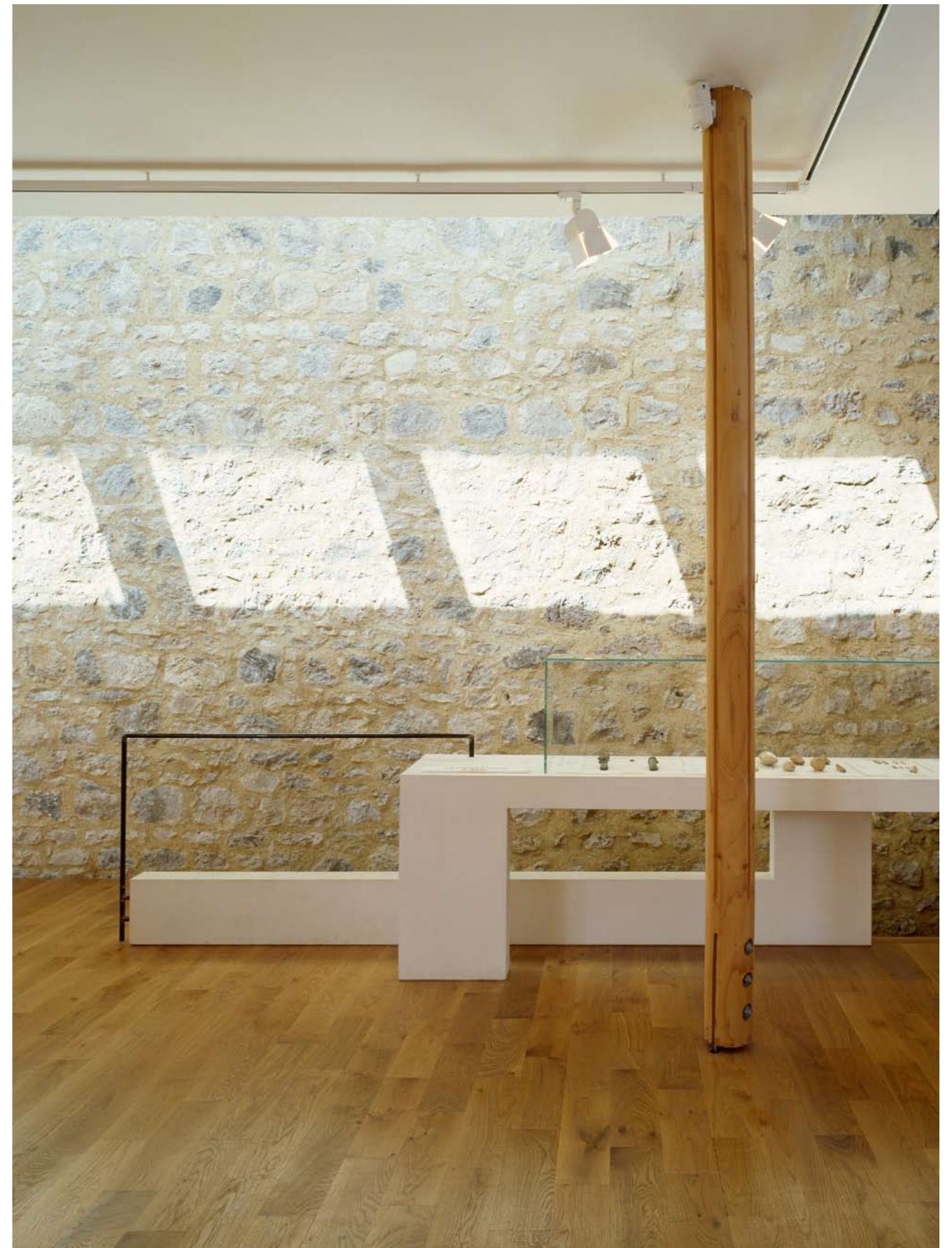


*Left (from top to bottom)*  
Cross-section of roof window

Axonometry of the new building.

The roof windows cause wandering light spots to slide across the rough limestone walls in the course of the day.

*Opposite* The exhibition furnishings are simple and bright. The parquet floor, the old castle walls, the round pillars and the plasterboard ceiling establish a contrast between structured, naturally evolved textures and smooth, industrially manufactured surfaces.





PHOTOS (P74-77): ADAM MØRK

## RAISING THE ROOF ÁTIKA CONCEPT HOUSE FOR THE MEDITERRANEAN CLIMATE

### Facts

|                      |   |
|----------------------|---|
| Provisional Location | Getxo (Bilbao), Spain. Itinerant          |
| Type of building     | Concept house (modular rooftop extension) |
| Clients              | VELUX A/S, Hørsholm, Denmark              |
| Architects           | ACXT/IDOM, Bilbao, Spain                  |
| Completion           | 2006                                      |

Vernacular architecture in Southern Europe is characterised by the clever and simple use of its resources like sun, air and water. For centuries, these resources have been used for cooling or heating and for achieving the best possible comfort of human habitats.

The density and thickness of the walls as a thermal buffer and the white lime applied as a reflecting layer on the outside, the window shutters, the shade from buildings and overhangs, the narrow streets and the patios as a way of ensuring shading and air flow, and the use of flowing water for cooling are some of the genuine solutions of the architecture around the Mediterranean sea.

Atika is an attempt to achieve comfort and reduce energy consumption in a house with simple but effective solutions inspired by the Mediterranean building tradition. It offers a solution for an energy efficient house in regions with enough sun, mild winters and hot summers where ventilation and cooling systems are traditionally major energy consumers.

"Generally speaking, roofs are not used as living space in the Mediterranean context. On the other hand, Atika is a roof house, a house under the roof," says Javier Aja Cantalejo of ACXT Arquitectos, responsible for the design of Atika. The building, which was first presented to the public at Getxo Harbour near Bilbao in October 2006, is divided into two basic functions: the house itself and its 'basement', a scaffolding structure that symbolises any existing building with a flat roof. It is a dematerialised support of the house on top, enhancing the characteristics of Atika as a free space that is different from the dwellings below. According to Javier Aja Cantalejo, the 'raise-the-roof' approach embodied in Atika is "a good possibility because of the quick assembly on

site and because it does not disturb the neighbours. On the other hand, it offers the additional benefit of renting space and protecting the existing roof surface from rain."

Seen from a distance, Atika is characterised by its white, zigzagging roof shape. As a direct interpretation of traditional Mediterranean architecture, the house consists of a series of rooms around an open space – a patio – that functions as a climate regulator by means of a shadowing canopy, a water pond and some vegetation. Atika houses a typical single-family space programme. It is divided into three parts, inscribed in a square of 10 by 10 metres. The two wings in the west and east – each 10 m long and 3.5 m wide – cater for the main living functions. They are separated by the entrance area and the open patio terrace in between. The slopes of the roofs are oriented north and south, with each space inside the house being assigned its own roof geometry.

Atika shows different case situations depending on the orientation, the type and the use of space, as well as the optimal daylighting and indoor climate in each case. This makes it a flexible organism that can open and close, breathe, catch sun energy and transform it according to the seasons.

Atika is designed to optimise the use of natural ventilation and night cooling with the help of an advanced electronic control system that automatically monitors the indoor climate. The system regulates the indoor climate by automatically opening and closing the windows and its accessories – blinds, shades and roller shutters – and by activating the cooling/heating system according to pre-set parameters such as temperature, humidity, time of day, season and burglary prevention.

The concept house is transported by road to the assembly sites. Its main

structure consists of perimeter steel frames for the floor and the roof surfaces. Steel columns and diagonal braces stabilise the structure. The floor is a reinforced concrete slab over a corrugated galvanised sheet. The 16-cm-thick thermal insulation panels are supported by a corrugated sheet on the roof and a lightweight galvanised steel frame at the exterior walls. Roofs and facades are both clad with a high-pressure laminate plate on the outside and plasterboard panels on the inside. The interior partitions are also plasterboard double skin walls with interior acoustic insulation. The floor finishings are ceramic tiles for the interior of the house and wood for the patio and terraces.

The kind of modular construction that was adopted with Atika, and the pre-assembly in a factory impart considerable advantages compared to conventional building methods: they reduce construction time to about a third, they make the structure more stable and precise, and they facilitate the use of high-end products and techniques for better thermal and acoustic insulation. Furthermore, they enhance the quality and the control of the building due to the indoor nature of its building process.

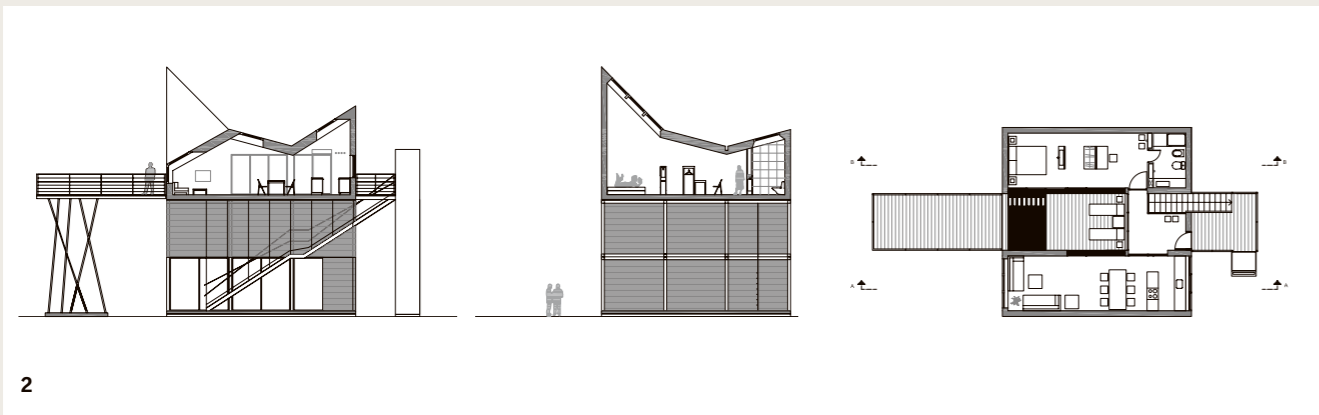
Atika has an innovative energy system where the solar arrays produce hot water not only for heating but also for cooling purposes. They account for about 70% of hot water supply and 30% of room heating, at the same time as feeding the air conditioning system. Solar panels with a total surface of some 10 m<sup>2</sup> are installed in the south-facing roof slopes of the house at angles between 15 and 60 degrees. They feed a hot water system to which an additional cold water system, used for cooling air in hot periods, is connected.

Heating in buildings – for hot water production and industrial proc-

**1. With its eye-catching silhouette, Atika dominates the landscape of the city. The modular concept house was presented for the first time in the harbour town of Getxo (Spain) in October 2006.**

esses – accounts for half the world's total energy consumption. The use of renewables – solar thermal, geothermal or biomass – represents a growing alternative to replace huge amounts of fossil fuels. In this respect, Atika can contribute significantly to what the EU Commissioner for Energy, Andris Piebalgs, identifies as one of the main challenges in future architecture: "By introducing improvements to our buildings we not only achieve more for ourselves, but at the same time make savings for our children."

More info on: [atika.VELUX.com](http://atika.VELUX.com)



2

**2. Cross-sections & ground plan .**

**3. Atika surprises the eye with an openness unusual for the Mediterranean climate. In spite of the lightweight mode of construction and the large wall area devoted to windows, the 'io homecontrol' system ensures a high degree of interior comfort.**

**4. The bedroom area is in the highest part of the building. The six roof windows allow the house occupants to enjoy a free view of the sky.**

**5. View through the living space, whose southern end is flooded with light. Both wings of the building are 10 metres long and 3.5 metres wide and have been transported by truck.**

**6. The patio between the sleeping wing and the living wing faces towards the south towards the harbour. The facades of the concept house are covered with high-pressure laminate (HPL) panels; a flat water basin serves as an additional buffer against the heat.**

DRAWINGS: ACT/IDDM



4



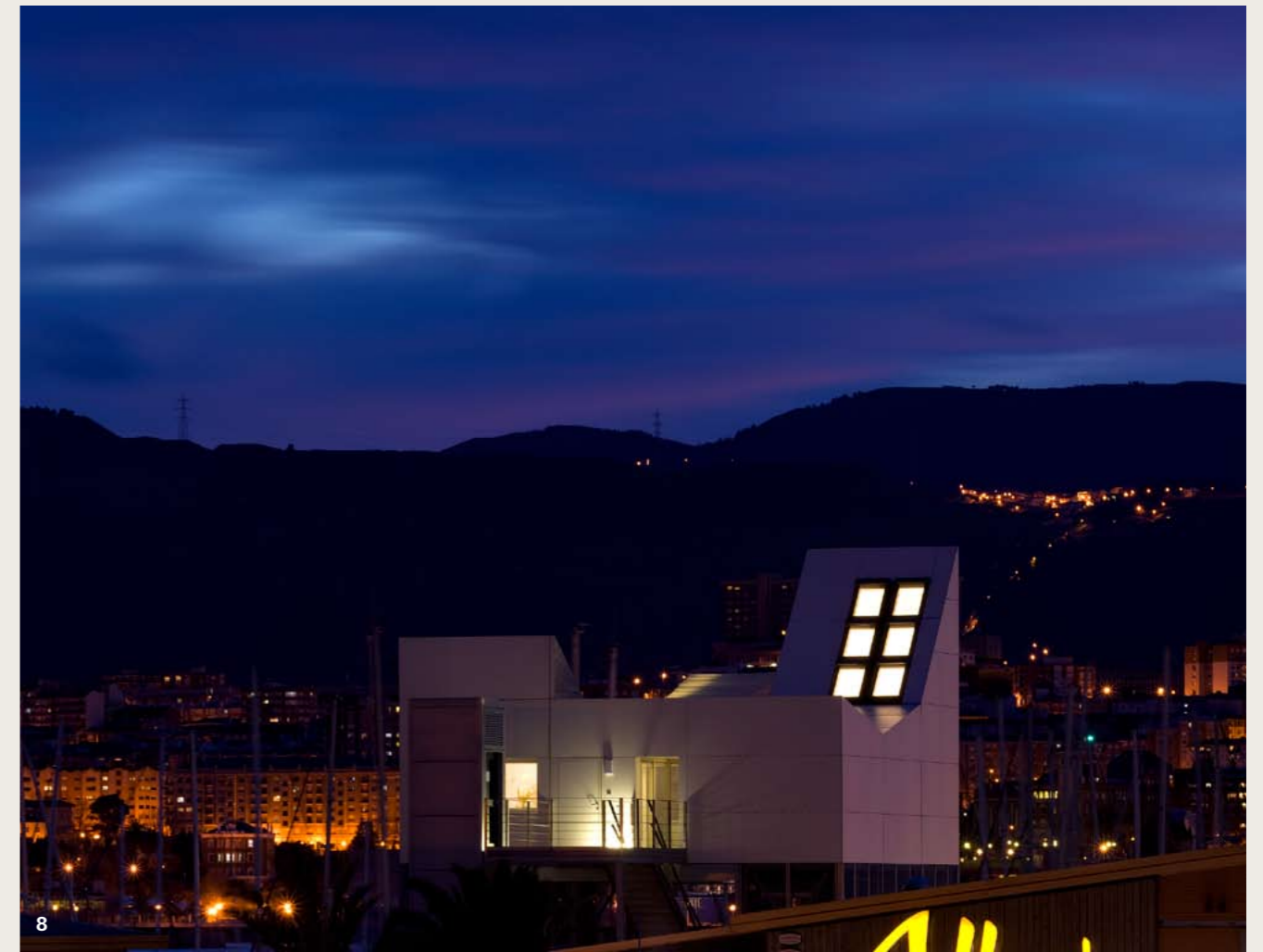
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5



6



**7.** In the north, the entrance area links the two wings of the building to form a U-shaped ground plan. Covered in wood, the patio is protected against see breezes and the eyes of the curious.

**8.** Towards the north, Atika is mostly closed off. Only the six roof windows above the bedroom radiate their light out into the night.



PHOTOS (P.00-03): RAINER VIERTLBOCK

## A CONVERTIBLE IN LARCHWOOD KLIMCZYK HOUSE IN RIEDEN

### Facts

|                  |  |
|------------------|--|
| Location         | Osterreinen, Rieden am Forggensee, Germany |
| Type of building | Single-family dwelling (semi-detached)     |
| Client           | The Klimczyk family, Rieden, Germany       |
| Architect        | Becker Architekten, Kempten, Germany       |
| Completion       | February 2006                              |

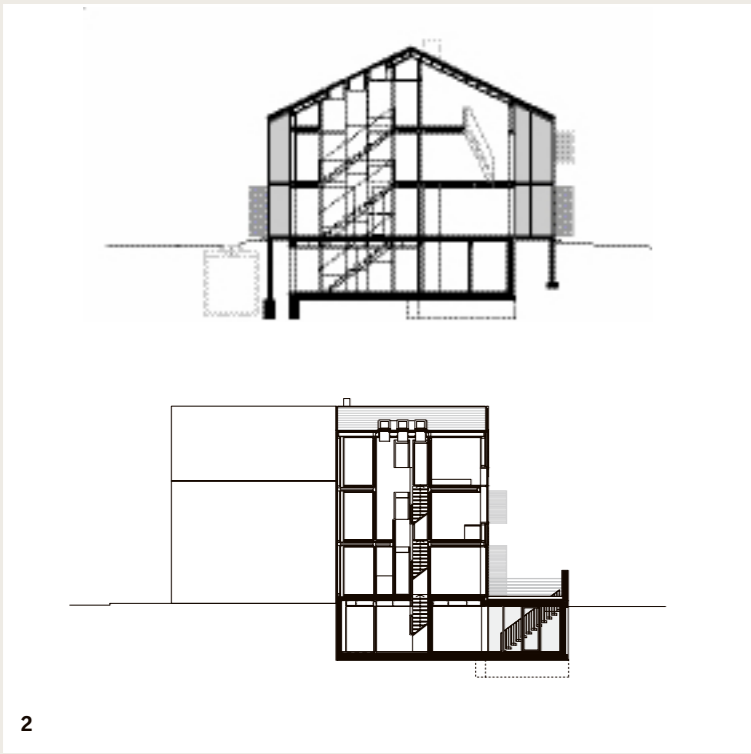
Rieden am Forggensee is situated in one of those regions of Germany considered by people in other countries to be the epitome of picture-postcard German countryside, 'discovered' in the early days of international tourism. Ruined castles, lakes perfect for bathing (seven within just 12 km of Rieden), and "cosy nooks and quaint corners" are some of the arguments put forward on the region's website for spending a holiday here. On the other side of the lake, within sight of Rieden, Neuschwanstein, the fairy tale castle of eccentric Bavarian king Ludwig II, towers over the dense coniferous forest.

However, highly attractive to tourists though the scenic beauty of Upper Bavaria may be, it often makes things very difficult for those attempting to construct contemporary new buildings in the area. Unlike the situation in Switzerland or Austria, for example, the architectural avant-garde is still finding it far from easy to gain a foothold in the region. The unwritten norm for housing here is the style accepted in the course of the 20th century, often without much reflection, as 'Alpine': flat-roofed, mainly white stuccoed houses with wide roof overhangs and equally projecting wooden balconies. Rieden's Osterreinen district, with most of its houses built in the 1970s, is no exception to this pattern. The so-called 'Schwangaustyle' houses, once so characteristic of the region (post and beam structures with open, generally south facing porches under the eaves) are now few and far between.

This typical style of regional farmhouse was the one chosen by Becker Architekten as their model for the design of the Klimczyk house. The house is a semi-detached building in the village centre, the other half of which is due to be added by the neighbours later on and with a differ-

ent architect. It was already known, however, that the neighbour was looking to build in stone, so the architects designed Haus Klimczyk as a timber 'extension', intended to adjoin its stone counterpart like the stables or barn complex of a farm. In order to underscore this concept, the house was timbered in larchwood with built-in sliding/folding shutters that will weather to a silver grey as the years go by. The shutters allow the loggias on the north and south sides of the house to be almost completely opened up. When closed, on the other hand, the shutters blend with the facade of the building to form a single, homogeneous shell that really does have a 'barnlike' touch about it. This gives the house enormous flexibility of use: like a convertible car, it can be adapted to any conceivable lighting or weather conditions.

Life inside the house is spread across all four floors, and the basement can be used as a self-contained 'granny flat'. It is angled around an inner courtyard and has separate outside access. The interior rooms are grouped around a central staircase core that is lit from above and lends the building a surprisingly spacious aspect. The light enters the building through skylights under which nine so-called 'light cannons' – light shafts made from white painted sheets of MDF – ensure a dazzle-free, even distribution. The other surfaces in the house have also been kept white and thus ensure optimal light efficiency: the living areas have been floored with white oiled parquet, and the walls are of white painted plasterboard and (in the stairwell) white painted hard plasterboard.



DRAWINGS: BECKER ARCHITECTEN

1. Like a veil, the larchwood slats conceal the loggias on the long sides of the house. By day, the building exudes a solid and impenetrable aura whereas, at night, it becomes a 'lantern' radiating light from all sides.

2. Longitudinal & cross section.

3. The stairwell inside is not merely used for access to the upper level. A wide stairwell hole serves as the visual link between the levels.

4. Nine striking 'light canons' provide non-glare lighting for the stairwell.



# LIGHT OF TOMORROW

Competitions have always been an important tool for architecture, and in particular those competitions with a program that is open for interpretation and initiates a challenge and direction that is both clear enough and strong enough to press architecture forward. In this sense it is not the aspect of competing that is most essential, but rather to offer and produce spatial discussions that can bring a new and deeper understanding to specific architectural challenges. A good competition can be like a breath of fresh air for its participants, since for a specific time span it brings reality into context and contents that belongs to the future. Competitions are a process where time is given a dimension, as each competition has its time limitation. One must produce within a set time span, and the competition requires one's full talent and concentration. Maybe it is just this combination, to feel the adrenalin and the exhaustion that follows that is so inspiring for many, but it is also taking part in something that clearly puts its emphasis on the creative act.

Architecture that retains a sense of social consciousness is important for the quality of the well being of our daily life. We are not able to separate architecture from culture, nor are we able to disregard the fact that architecture occupies land and is part of place. And, it is in this sense as a spatial object that architecture belongs to everyone. Therefore, to improve our build environment is a responsibility that should involve most people, and it is rather obvious that architectural schools are one the most important institutions to promote and activate this global concern.

VELUX has been both intelligent and wise to see the future through coming generations rather like an extension that taps into the budding directions and flow of young ideas. It is a company that seems to believe

in young people and their capacity to give a spatial picture to future directions. To put it very simply, young people are not looked upon in terms of immediate profit or market, but rather as a source of inspiration. For many years VELUX has been a very important and rather unique sponsor of architectural education.

The VELUX award, "Light of Tomorrow" offered an opportunity for students and teachers of architecture to venture out into a spatial investigation. But, to bring this investigation to fruition has also required architectural courage. When the appointed jury (Arch. Kengo Kuma, Japan, Arch. Roisin Heneghan, Ireland, Dr. Omar Rabie, MIT, Pres. of AIA Douglas Steidl, General Manager of VELUX, Massimo Buccilli and myself) met in Madrid this summer, we all felt honoured to be asked to take part in this work. As scholars/architects we are clearly apprised of the struggle, the creative energy and the hopes that lie behind each project. Far different from mature and experienced work, these rather young, fledgling schemes presented by the next generation of architects bear the first signs and interpretations of "Light of Tomorrow". With each new generation, there is always an ever so slight shift in the reading of the relationship between context, time, and space that indicates future attitudes and desires. Therefore, I have a strong respect for student competitions. As a total body of work, the entries form an impressive achievement, and the jury would like to congratulate all the participants and send a warm thanks to VELUX for taking up the challenge and directing their efforts both in a professional and generous manner, but also for giving the young generation a voice and an opening for experimentation. The invitation text initiated the following discussions:

'Light of tomorrow' is the slogan of the International VELUX Award 2006. Its interpretation was left up to the individual students: concrete designs for buildings were submitted as well as very conceptual works which explored the borders between architecture, sculpture, landscape planning, power systems, biology and many other areas.



DORTE MANDRUP ARKITEKTER IN COLLABORATION WITH BAK - BRANDLHUBER & CO / PHOTO: TORBEN ESKEROD

"The award wants to pay tribute to daylight, just as it wants to discuss, stimulate and rethink daylight in a role which is not merely "moderated" by architecture, but becomes a crucial primary aspect of the design."

"The award would like to encourage projects that go beyond the fact that light exists." And, move towards "projects that demonstrate experimentation and thinking directed towards the unknown, going to the edge, finding the essence, working with perception and exploration as well as demonstrating the sociological and environmental dimensions of light"

"The award wishes to acknowledge not only the students, but their tutors as well."

The total number of entries was 557, and represents a remarkable variation of ideas and approaches related to the theme "Light of Tomorrow". With entries from all over the world, the competition offers a body of work that gives a clear indication and insight into the interest and concern for light as an essential architectural material. Light's capacity to be interpreted anew seems unending.

The new generation of young, upcoming architects represented in this competition have offered a multiplicity of methods and directions by which daylight will hopefully continue to play an important role in all architecture. The transformation of light's spatial potential is an energy that will always allow for personal motivation and interest. Some contestants focused on a direct spatial form of interpretation and connection, while others invented advanced mechanical devices to form a particular light identity. One can sense, at least with what is indicated by the numerous projects of the contest, that today's architecture has

no common desire or spatial direction. Instead, the projects signal a multiplicity of directions and concerns, and for all this, independent of changing attitudes, light continues to play an important role as a common denominator and inspiration. In relation to the topic, some projects held their discussion to a general level, while others focused upon a specific conceptual idea.

The jury has been open for all the various approaches, since it is the quality of the project and how the project has challenged and forwarded an architectural discussion in relation to the given theme. It is this that has been important in the final selection. The jury members have felt honoured to take part in this event, and the vast number of entries with different and challenging topics set the stage for a vital and provocative debate. The three winning projects have the jury's unanimous vote.

1st Prize  
Louise Grønland  
*A Museum for Photography*

2nd Prize  
Gonzalo Pardo  
*Reading Place in the Forest*

3rd Prize  
Anastasia Karandinou  
*Light Invisible Bridges*

**Per Olaf Fjeld**  
*Chairman of the Jury*

For more info, visit  
[www.velux.com/a/](http://www.velux.com/a/)



# INTERVIEW WITH LOUISE GRØNLUND

**Louise Grønlund** lives in Copenhagen, where she has been working for Lundgaard & Tranberg architect's studio since January 2007. She also has a part-time job as a lecturer at the Royal Danish Academy of Fine Arts in Copenhagen.

**D&A** What have the culture that you have grown up in, as well as your architectural education, taught you about light?

**LG** The light in Denmark and in the whole of the North is something quite special. It is a reflection of our culture on a variety of different levels, including the way we live and build. I believe that the soft, diffuse and somewhat less intense 'Nordic light' is something that all architects, both practitioners and theoreticians, pay a lot of attention to. The special aspect of light in Denmark is the existence of very different brightness conditions linked to the different seasons. But even within the individual seasons, small differences exist that make the light here something unique. Many architects in the North are highly aware of this circumstance in their approach to their work. This awareness of the special nature of Nordic light is communicated by lecturers to their students at architectural colleges here in Denmark. It is possible to read up on or find out about light conditions here from others, but it is only your own first-hand experience that really brings home the effect that light engenders within a space.

**D&A** Has your work led you to any new discoveries in the properties of light?

**LG** Over the past semester at architectural college and particularly during my final project, Museum for Photography, I spent a lot of time investigating the effects of light in space from a phenomenological perspective, in other words the nature of our sensual perception of space and light as a body. My research and experiences have awakened my particular interest in the nuances and fine differences occurring in Nordic light, and in how, by means of very conscious, painstaking precision work, buildings

can be designed and built which work with and highlight these fine differences. My aim is to work with architecture in a way that illustrates the special phenomenon of the light – architecture as a light machine.

**D&A** What direction do you think the use of light in architecture will take in the 21st century? Is it likely to become more technology-driven or motivated by human needs, or alternatively the need to save energy – or perhaps a mixture of all three factors?

**LG** I believe that light is set to assume a range of very different roles and 'functions' in 21st century architecture. There was a long period when it was technically possible to design houses made almost completely of glass in order to capture large amounts of daylight, but there is certain to be a reverse reaction to this trend. To some extent this will emanate from the question of whether we should be focusing our interest on the amount of daylight, or whether we should be looking at this issue from the perspective of use of resources. This is why I believe that we will see an architectural movement that bases its use of light on a far greater degree of awareness and precision, based partly on the needs of people but also on purely architectural aspects.

**D&A** Does your Museum for Photography project set out to question the traditional perception of exhibition spaces that are primarily designed inside museums, usually as neutral boxes with static lighting unaffected by daylight?

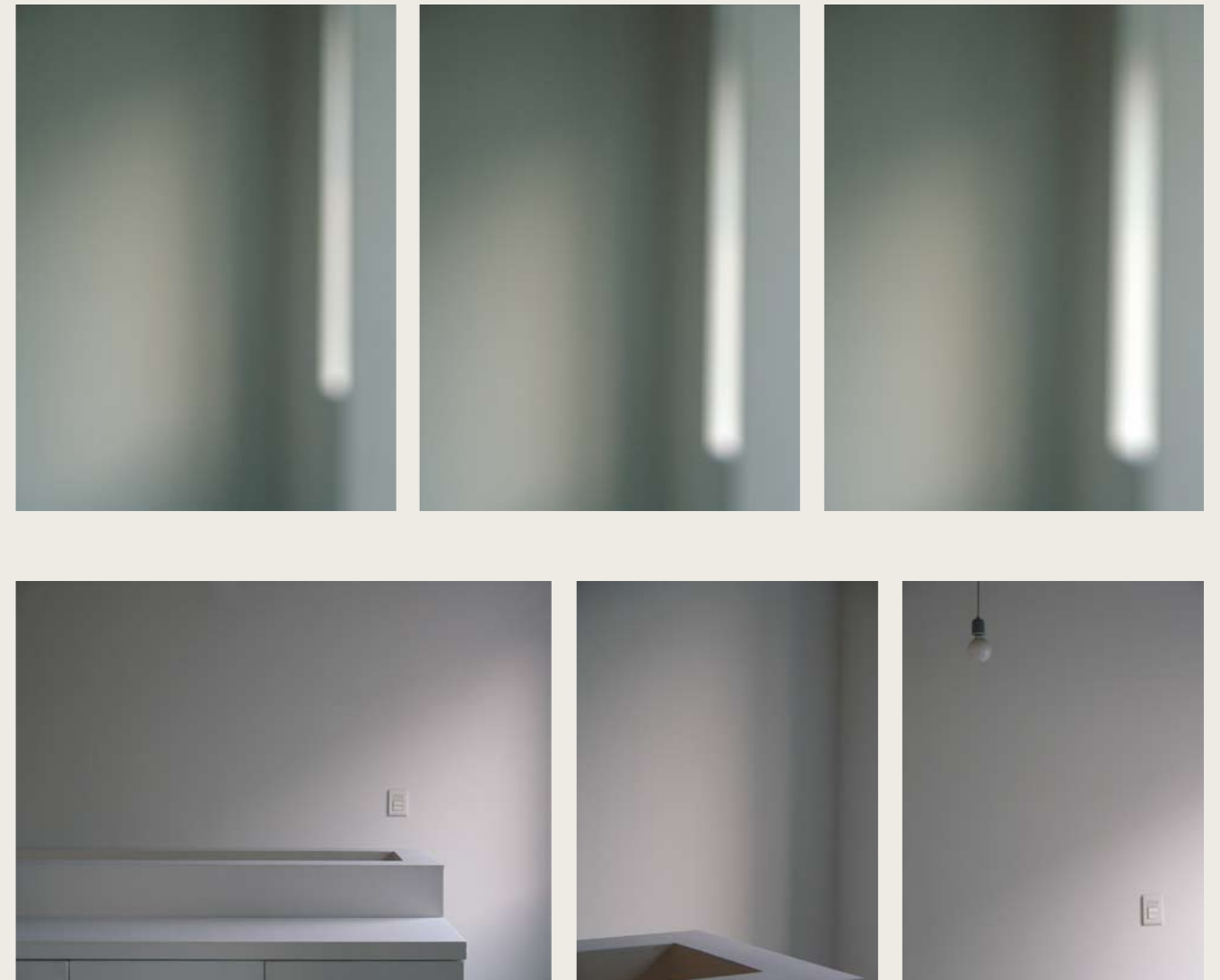
**LG** For my Museum for Photography project I attempted to create optimum visual conditions for the observer, in other words, on the one hand the observer sees the exhibited

photographs, but at the same time is made aware of his own visual perception; that he sees into the room he is standing in, feels the light in the room and is able to perceive the expanse of space. I very deliberately set out to work with these different states of brightness or 'light worlds' in the individual exhibition rooms, and consequently with the differences between one room and the next.

**D&A** In this context, what can be learned by historic museums such as the Glyptothek in Copenhagen with its large, top-lit rooms whose atmosphere breaks dramatically with the daylight conditions prevailing on the outside?

**LG** The space inside the Glyptothek is particularly interesting, as it 'shows' us the light and consequently makes us, the observers, aware of the influence of light on the way we see and experience the room. This experience may result in a situation where, in time, the observer becomes more clearly aware of the light and its effect on the space. But the space in the Glyptothek also exerts another effect, because it does not exclude the 'context' and the 'real world' outside but instead draws it into the space.

*Below It is not only in her winning projects that Louise Grønlund concerns herself with photography. In her private life too she has a great affinity for this medium, as these extremely reduced photos of spaces in different light conditions show.*



# INTERVIEW WITH GONZALO PARDO

**D&A** What have the culture that you have grown up in, as well as your architectural education, taught you about light?

**GP** Growing up in a country like Spain gives you some consciousness of light, that is to say you are aware of the way it changes. Throughout the year, the seasons and the days, light never is the same. However, it is the teachers at the school of architecture who imbue us with an understanding of the need to work with light and take advantage of its potential. Not only by taking it in account in projects but also by working with it as a parameter that has a critical influence on the organisation and construction of an entire building. It's a real challenge.

**D&A** Have you yourself come across any properties of light that have had a particular influence on your work?

**GP** Now I'm interested in working with light as a material, like brick or concrete, and exploring its possibilities. I think that in every project, light should be allowed to change the perception of place through a rich variety of spatial conditions and contrasts, i.e. through dualities like dark vs light, public vs private, open vs close, interior vs exterior or high vs low, lightness vs massive.

**D&A** What changes do you predict for the 21st century both in the way humans use light, and in the balance between daylight and artificial light?

**GP** I think that right now, daylight and artificial light have the same importance. New technologies allow the recreation of daylight atmospheres with artificial systems. This is important because in the future, this kind of development could change the form of buildings and generate a new thinking in how to use space.

**D&A** In your project for the International VELUX award, you create an architectural field with highly varied spatial and lighting situations. In your opinion, has architecture begun to offer the user more varied, non-standardised solutions recently? And what aspects does this quest for variation include: form, colour, proportions of spaces, combination of uses, and/or light?

**GP** The aim of my project and of the investigation related to it is the creation of complexity, both in terms of space and light. The reading place is a three-dimensional network, not a building; so the work process was focused mainly on the generation of this space through different working models. In this process, the organisational configurations were originally more important than formal solutions. These different configurations allowed a variation of forms, colours and proportions in one single day by working with light. For me, only concepts should remain: the attraction of architecture is the ability of an idea, when it is linked to concepts and not to forms, to acquire diverse formalisations. The challenge in my project was to create something from light as a material.

**D&A** But it is the balance of light and shadow that plays a major role in your project, not just light itself. Is this rooted somehow in your personal experience? Is there a lack of public spaces with balanced lighting/shade in your local environment?

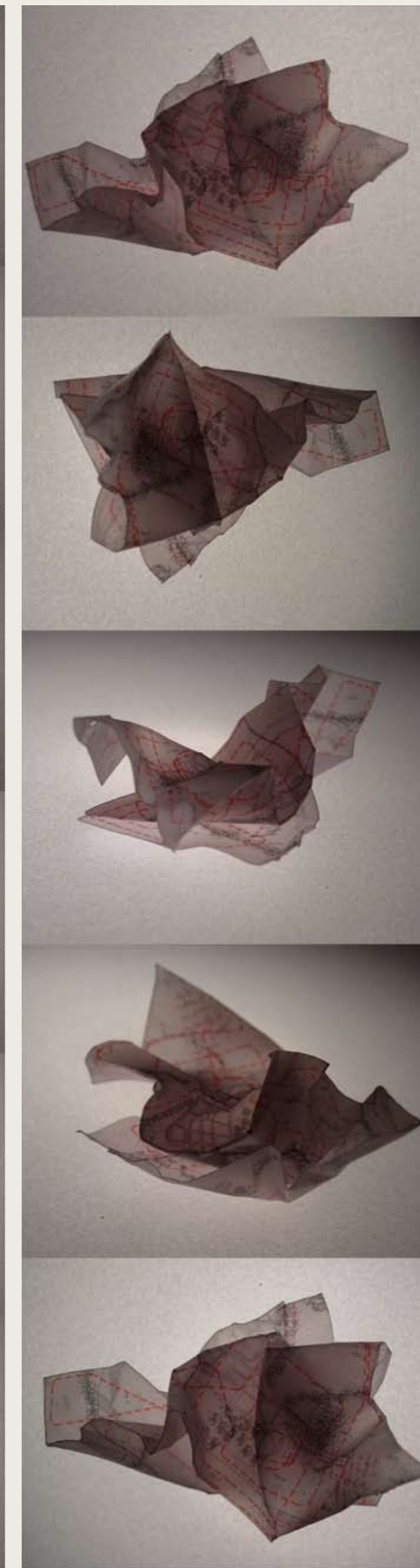
**GP** I think that the concept of light means not just light itself – I believe it is also linked to other words like shadow, textures, reflections, massive, static, coloured, and so forth. In my award project, I chose to work intensely with the contrast of light and shadow. The theme of light allowed me

**Gonzalo Pardo** lives and works in Madrid, where he is working on his final examination project at the Escuela Técnica Superior de Arquitectura de Madrid (ETSAM). He also works as a teacher at ETSAM, financed by a two-year grant, and takes part in competitions as well as working on his own projects.

to imagine a system of abstract rules that regulate the decisions and actions in the whole design process. The result was a space full of different lights and different perceptions: a place for reading from light and perception.

**D&A** Kengo Kuma, a member of the award jury, said in an interview: "Material and natural light are one thing." Would you agree, and what consequences does this observation have for your own work?

**GP** I absolutely agree. In my project, I worked with materials and natural light using the space that a tree generates around it, its field. The tree, especially when it is linked to other trees, offers the privacy that the act of reading needs. A strict relation between the person, the book and what surrounds them is established. The result is a new, continuous landscape full of light-emitting columns that organise the space. These columns will influence the game of looking and not being looked at, allowing for the kind of individuality that the act of reading needs. The topography of the project spatially organises the reading place, whereas its structure reconstructs the forest.



**Left** Architecture can be anything and everything – even a folded piece of paper. This conceptual attitude was formulated by Gonzalo Pardo in his design for a 'Palace of the Little Princess Leonor' in 2006. It can also be clearly detected in his prize-winning project for the International VELUX Award.

# INTERVIEW WITH ANASTASIA KARANDINO

**Anastasia Karandinou** comes from Athens, where she obtained her diploma in architecture at the National Technical University. At the moment, she is working on her PhD thesis on the topic of materiality and immateriality in architectural theory and in architectonic design at the University of Edinburgh.

**D&A** What have the culture and education you have grown up in taught you about light?

**AK** A great deal about daylight. In Greece, the light can be very strong and sharp, and so can the shadows. The architecture in parts of Greece is strongly affected by the particular light conditions – the way forms look under a certain kind of daylight, the need to be protected from light and heat, and the need to filter or direct light in order to create certain conditions or moods are all aspects that influence the architecture of a place.

In the school of architecture in the N.T.U.A. (National Technical University of Athens) we had the chance to be guided through several design and theory projects in which light is always an important element. By light I mean the whole range of lighting levels: strong light (both daylight and artificial light), as well as dim, soft light and darkness and the absence of light. Darkness is thus a condition of light that de-prioritises the visual (and probably prioritises the other) senses.

**D&A** What properties of light have you discovered yourself that you consider important?

**AK** The study and projects guided by my teachers in Athens, Eindhoven and Edinburgh were extremely challenging and provocative, and made us develop ways of thinking about architecture and light. In my Shanghai project, for example, which I submitted to the International VELUX Award, light functions as the element that establishes the connection and dis-connection of the two sides of Suzhou River. It functions as an invisible or immaterial bridge between these two parts of the city, and it connects and disconnects them, as has happened several

times in the history of this part of the city; in times past, the river was the boundary between the British and the American settlements. At the same time, rather than being decorative, the light has a very precise and rational role: it is emanated from the open-air cinema (as projection light), the light phone boxes, and by the underground film school through the 'cracks' in the ground.

By handling light in this way, I interpret the place in two ways: it indicates the connection and disconnection of the two parts of the city by creating immaterial bridges; and the proposed kind of light is an interpretation of the existing lights of the area, which are also constantly moving and changing (cars, mobile kiosks, the lights of the houses,...).

Looking into the lights and lighting of a space, we can read aspects of the life that takes place there. If we had a light map of regions of Shanghai, it would probably reveal qualities of the place to us, or rather provoke us to look into particular places and try to find out what is happening there.

Light can also function as a drawing tool – as a 'pen'. In the procedures of interpreting and representing Shanghai, one of the drawing tools I chose was light. We made models of the city with several materials such as plastic, plaster and wax, on which we drew routes, activities and information, with carving tools. The light traced and 'drew' these representations of the city, and the imprints made were our maps of the city.

We met an old Chinese man by the river in Shanghai drawing a phrase on the ground with water – again and again. Before he had finished the phrase, the beginning had already evaporated – but it had been read; it was as if he was 'drawing' with a light torch.

**D&A** In your IVA project, you use light to establish links between spaces and people that were separated before. How far is this strategy based on your own personal experience with light acting as a link – both spatially and symbolically?

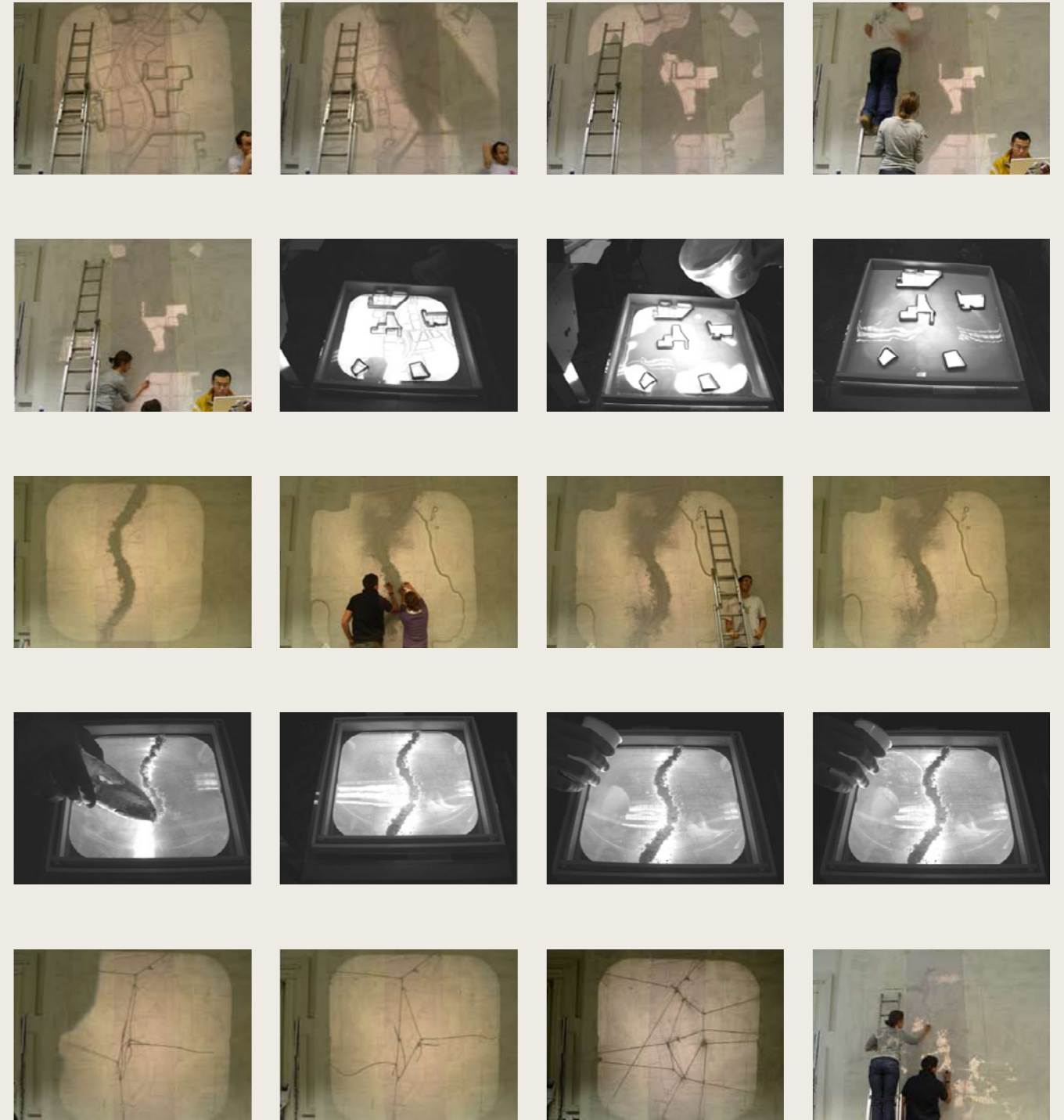
**AK** Light can act as a link in several ways; a lighthouse links the observer or the traveller to a known point, for example. It can link by pointing out a direction or it can link spaces or people by making a place for things to happen. Light can create the conditions for activities, and the way a space is lit indicates what kind of activities are likely to happen there.

In the Theatre Square in Rotterdam, for example, the spotlights (whose position and direction can be controlled by the users of the space to the space itself, which in this case functions as a kind of stage. In other cases light – such as fire – concentrates (links) people around it. Its absence can also make people congregate – in a hot, sunlit place, for example, people will get together in the shade.

Light acts as a link in other ways too – by creating a synthesis that refers to other elements or qualities of the place. The immaterial light bridges link the life of Suzhou river to its past and also to fragments of the present that are hidden or scattered. They link fragments of the city – small details and events – by interpreting and re-presenting them.

**D&A** Your project aims to introduce light into Shanghai, a city that is – to say the least – already well-lit in most spaces. Currently, lighting designers are in the midst of a worldwide discussion on 'light pollution'. How do you avoid simply adding something in your project of which there is already too much?

**AK** Some parts of Shanghai are well-lit or even over-lit. The Suzhou river area though, is lit in a very particular way. There is very little, if any, public lighting, so the existing lights are all moving: cars, mobile kiosks, the lights of houses or flats that go on and off unexpectedly... This creates very interesting conditions of urban lighting. My proposition is an interpretation of this situation. Light is not there to illuminate the place – it is either the result of some function and/or a designing tool, as well as a narrative tool. The 'lights' in my proposal are moving or changing according to their function – just as the existing ones do. The open-air cinema, the phone boxes are of changing brightness depending on the time of the day and on whether they are being used or not.



**Above** For Anastasia Karandinou, light was also a basic supplementary factor during her work on the Shanghai project. Abstract plans of the city were made out of malleable materials like wax and plaster, projected onto a wall and then re-drawn with pens on paper.

# BOOKS

## REVIEWS

For further reading: recent books presented by D&A.

### DESIGN LIKE YOU GIVE A DAMN

Editor: Architecture for Humanity  
Metropolis Books 2006  
ISBN 1-933045-25-6

It is 2006. The whole world looks on spellbound at the headlong growth of Shanghai, the artificial islands being built off the coast of Dubai and regeneration of the World Trade Center site. The whole world? Not quite. There is a growing community of architects, most of them young, that is opting to withdraw from the race to design the most prestigious company headquarters, the most luxurious holiday resort or the world's highest skyscraper and instead is turning its attention to a far greater challenge: that of creating decent shelter fit for human beings for the world's over one billion homeless, whether victims of natural disasters, civil war refugees or slum dwellers.

Leading players driving the movement include American architect Cameron Sinclair and his wife, journalist Kate Stohr, whose organisation Architecture for Humanity is behind the publication of *Design Like you Give a Damn*. In the intro-

ductory pages, Sinclair describes his own career, which follows a similar pattern to so many of the activists from the world of development aid and disaster relief: a profound vocational identity crisis ("I found myself designing lipstick dispensers for a store in a place where the average weekly salary was equal to the price of one lipstick"), a socially committed mentor and a life-changing trip to a needy region (HIV/AIDS-ridden South Africa) culminated in the formation of an organisation that initially spread its message primarily through staging exhibitions and architecture competitions.

In *Design Like You Give A Damn*, Sinclair and Stohr document the development of emergency shelter and interim homes over the past century, or more precisely since the 1906 earthquake in San Francisco, and the underlying conditions in which these came into being. But first and foremost they look at present-day approaches to the problem, in an age where statistics documenting humanitarian and natural disasters are published with greater rapidity than ever before. Media interest in the wake of humanitarian disasters is not always an objective yardstick, as on-going situations that drive aid organisations to the limits of their capability such as long, drawn-out civil wars, droughts or the HIV/AIDS epidemic in Africa, are often far more devastating in their effect than the earthquakes or floods that capture news headlines. *Design Like You Give a Damn* clearly illustrates the wide variety of guises taken by architecture for the needy, ranging from tent cities erected by UNHCR through to a sleeping bag donation scheme for the homeless in Baltimore, and from a women's shelter in Senegal to the Rural Studio buildings erected in southern Alabama.

The book features a number of in-

terviews conducted by the editors with the protagonists of humanitarian architecture about their experiences. Their answers elicit both admiration and disillusionment, illustrating just how much even individuals on restricted budgets can achieve but at the same time outlining the magnitude of the hurdles that have to be overcome. Red tape and corruption join forces with logistical problems and cultural divides. Consequently, the prefabricated one-fits-all solutions that were thought to apply across cultural boundaries are now on the decline, even in the lowest house building price bracket, and construction concepts using local resources – both human and material – appear to have become the key to success.

Although wishing *Design Like You Give A Damn* the broadest possible readership, there is no denying that this in itself will not achieve anything. As one development aid worker put it, "We don't need your awareness, we need your support!". If this appeal is to be taken seriously, it entails a total rethink on the part of the architectural community. The victims frequently understand better what is needed than the self-acclaimed experts. Clean drinking water rather than windows, for instance, or jobs rather than paved walkways. Which begs the question of the extent to which architects are needed as designers in this type of project. In answering this question, architect Maurice D. Cox from Charlottesville, instigator of the highly regarded Bayview Rural Village humanitarian settlement project on the east coast of the USA, sets out the quintessential argument of the entire book: "We need to be in the places where problems exist. We have to be in the room when the decisions are being made to be able to voice our opinions. Then our talents will be exploited. That's

how you get design to be important. Designers need to be engaged, to be civic leaders, to be in the right place at the right time."

### THE EXPANDED EYE

Publisher: Kunsthau Zürich,  
Bice Curiger  
Hatje Cantz Verlag 2006  
ISBN 3-7757-814-1

Stalking the Unseen is the subheading of this catalogue and the exhibition of the same name that was staged at the Kunsthau Zürich art gallery in the summer of 2006. Associations with a drug-happy generation of hippies and techno geeks are not so very far off the mark: sixties art plays a major role in *The Expanded Eye*, notably research into human vision and its perceptive apparatus comprising the eye and the brain, whose fallibility and manipulability Op-Art and experimental filmmaking attempted to portray with their boundary-expanding flickering pictures and optical illusions. The much quoted and occasionally misquoted concept of breaking with accustomed perceptions was coined during this period, and with it the idea of 'seeing ourselves seeing' that lives on today, for instance in the work of Olafur Eliasson.

The selection of over 100 works of art featured in the exhibition and the book starts with the early Rotoreliefs of Marcel Duchamps dating back to the 1930s, round discs showing asymmetrical coloured patterns that, when rotated, merge into concentric circles of colour. It continues its journey with Laszlo Moholy-Nagy's Light Space Modulators and Op-Art through to the present day – represented for instance by Olafur

Eliasson, whose *The Inner Kaleidoscope* was on show in Zürich. The media chosen by the artists are as varied as the genres: paintings by Salvador Dalí and Josef Albers, pen and ink drawings executed under the intoxicating influence of mescaline by Henri Michaux, kinetic sculptures by Jean Tinguely, wire reliefs by Jesús Rafael Soto, holograms by Bruce Nauman, light installations by James Turrell and *The Exploding Plastic Inevitable*, Andy Warhol's intoxicating total art work comprising light projects and music by Velvet Underground that was to make an indelible stamp on the club culture of the later sixties and seventies. Surprisingly, the natural successors to these former underground installations, today's pop videos, receive not so much as a mention in the book, which turns its attention exclusively to the products of what is perceived as 'high art'. Even decades after Warhol preached for the breakdown of barriers between art and commerce, at least among the art world establishment, these seem as impenetrable now as they have ever been.

Anyone interested in finding out more about interaction between Op-Art and popular culture will be hard put to find any pointers in the editorial section of the book. The six introductory essays are still worth reading despite this, in particular Kritik des Auges – Auge der Kritik by Diedrich Diederichsen, in which the Berlin-born cultural scientist explains what made the sixties a time for the human eye to 'run wild' so consistently, and why Op-Art remained in vogue for such a brief moment in time: its proximity to the merely decorative and its dearth of content beyond the merely visual made it appear repetitive and tiresome.

The six essays and plethora of illustrations in *The Expanded Eye* is

supplemented by an anthology made up of text examples and a lexicographic collection of key words taken from art, cultural theory, psychology and physiology. Ranging from Rudolf Arnheim's *Kunst und Sehen* to Josef Alber's *Interaction of Color* and Susan Sontag's *On Photography*, the selection covers almost every aspect of human perception. Those who find this too narrow a perspective should take a look at the article by biologist Rüdiger Wehner. Wehner has been concerned for over 30 years with the study of the cataglyphis, a type of ant living in the Sahara. Although unable to distinguish between colours, its ability to recognise the polarisation patterns of the sunlight enables it to find its way back to its nest in the monotone desert landscape over distances of hundreds of metres. It would appear that nature offers the best paradigm for unbounded vision.

### INVISIBLE ARCHITECTURE

Experiencing Places through the Sense of Smell

Authors: Anna Barbara,  
Anthony Perliss  
Skira Editore 2006  
ISBN 88-7624-267-8

When Grenouille, the tragic hero of Patrick Süskind's novel *Perfume*, first steps out into the streets of Paris, what fascinates him most is not the impressive architecture, the colours and the cacophony of sounds, but the thousands of different fascinating fragrances and the equally varied shades of repugnant stench which fill the air of the French metropolis. In the novel, Süskind is more successful than any author before him

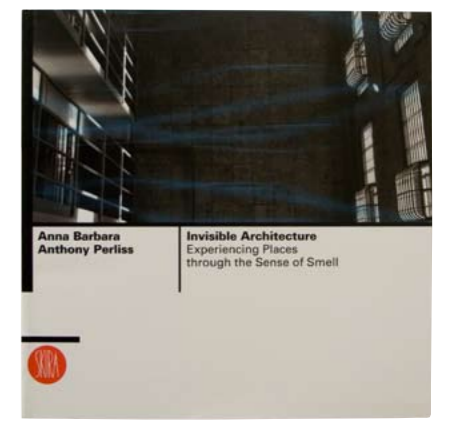
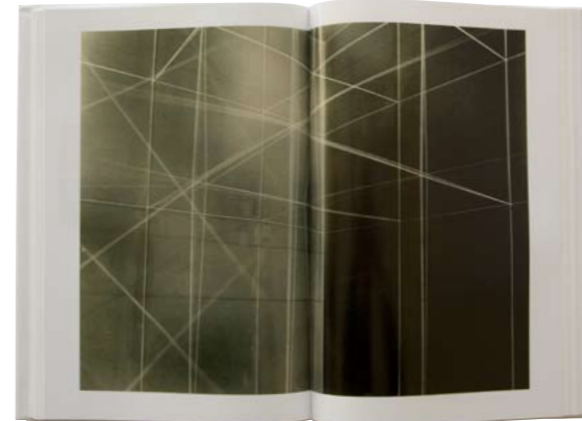
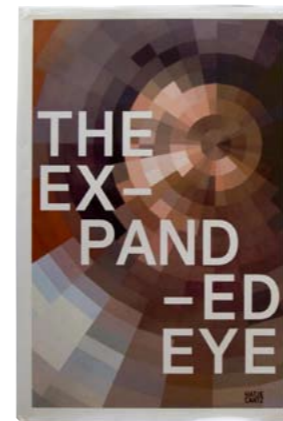
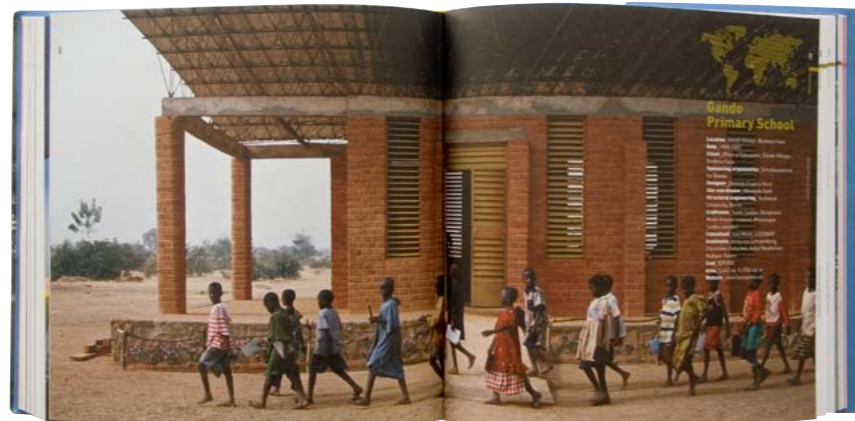
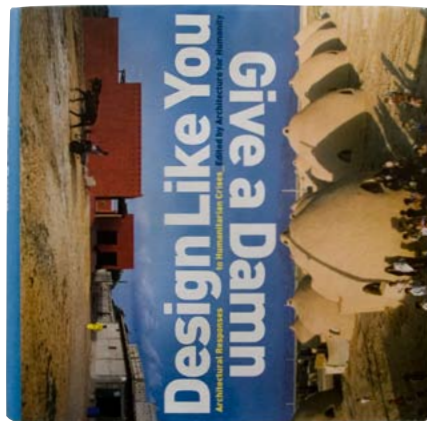
in enticing the reader into the world of smell. But although *Perfume* has sold hundreds of thousands of copies and has recently been made the subject of a film, the topic of our olfactory perception of locations, people and objects has been relegated to something of a wallflower in contemporary literature.

Anna Barbara and Anthony Perliss have now taken a new look at the subject in their book *Invisible Architecture*, an attempt to retell the story of human culture and its reflection in architecture in the light of our olfactory perception and smells both fragrant and putrid. If we are to believe their thesis, smells held (and still hold) a truly evolutionary significance. Prehistoric man's development from quadruped to biped marked the physical removal of the human nose from the ground and out of reach of its multiplicity of odours. And even more recent cultural and technical history can be interpreted, according to the book, as a gradual extinction of the odours which used to surround us. In contrast to materials like wood, straw and clay, the majority of building materials used today fail to exude any appreciable odour. Instead, a domesticated fragrance is deliberately manufactured in every area of interaction between people – from the perfume we wear to attract a partner to the 'government standard bathroom malodor', a weapon devised by the US Department of Defense to engender an immediate flight response in the enemy.

Instead of providing a chronological step-by-step treatment of the topic, Barbara and Perliss have broken down the book into seven chapters with titles such as *Emotions and Rites, Identity and Memory, and Bodies and Distances*. They also invited five perfumiers and five architects to meet with them on lo-

cation to talk about places with unusually close ties to certain smells – for instance in the catacombs and in the 'Ateliers Hermès' in Paris, in New York's Meatpacking District, in a Dutch windmill or the Giardino dei Semplici in Florence.

Although the fact that the chapter *Death and Entropy* takes pride of place at the beginning of *Invisible Architecture* does make for a somewhat unappetising entry into the book, mention of cesspits, human sacrifices, chemical warfare and rotting food should not put off would-be readers from venturing on through the remaining chapters. *Invisible Architecture* is a true roller-coaster ride through five millennia of olfactory history; although the narrative sequence may come across as somewhat confused, every new twist and turn brings with it new discoveries about a topic that, without doubt, has been under-represented in historical narrative to date. Even the tricky question of how to illustrate a book about the olfactory sense has been cleverly solved by the authors using whole-page photographic plates of living rooms, cult sites and city squares, locations and non-locations from around the world that have been treated with fine, subsequently applied fragrances to give off a waft of odour. While the use of this type of technique can undoubtedly easily slide into the realms of gimmickry, in *Invisible Architecture* the degree of subtlety with which it is used contributes towards making this book a thoroughly successful all-round art work.



# BOOKS

## RECOMMENDATIONS

European architects recommend their favourite books in D&A.



3



### 1 RAINER MAHLAMÄKI RECOMMENDS

#### Alvar Aalto – Designer

Editors: Tuukkanen, Pirkko  
Alvar Aalto Museum/  
Alvar Aalto Foundation, Helsinki  
ISBN 952-5371-04-2

This book is the first comprehensive publication looking at the furniture and product design of Alvar Aalto. Over 240 pages featuring 300 colour photographs, some previously unpublished, the book provides a comprehensive illustration of the work of Alvar Aalto as a designer. The illustrations are accompanied by a variety of illuminating articles by the likes of Timo Keinänen, Pekka Korvenmaa and Ásdís Ólafsdóttir. Alongside crystal glass and light designs, another key focus of Aalto's work is furniture design, which features largely in the book. Kaarina Mikontranta, Curator in Chief of the Alvar Aalto Museum in Helsinki, provides a historic survey of crafts and furniture design since 1920.

#### Juha Leiviskä

Editors: Marja-Ritta Norri, Kristiina Paatero  
Museum of Finnish Architecture, Helsinki  
ISBN 952-5195-09-0

Juha Leiviskä is among the most highly esteemed contemporary Finnish architects. He is especially famous for his sacred buildings, such as Myyrmäki Church in Vantaa and Männistö Church in Kuopio, and for his exquisite use of light as an architectural element. The 216-page book in English and Finnish offers extensive presentations of 43 buildings and projects and a complete catalogue of works with introductory texts by the architect. In addition it contains the architect's autobiographical notes and Kenneth Frampton's article on Juha Leiviskä's work entitled *Landform, Fabric and Light*.

#### Donald Judd: Architektur – Architecture

Editor: Peter Noever  
Hatje Cantz Verlag  
ISBN 3-7757-1132-5

This book, a 144-page revised and updated bi-lingual edition of the original German edition published in 1991 to mark the Judd exhibition at the MAK Museum of Applied Art in Vienna, illustrates one of the lesser known sides of the American minimalist Donald Judd: his architecture and furniture design. The artist's standpoint on architecture and design is illustrated in drawings, design sketches, plans photographs and articles, some by Donald Judd himself. Also featured in the book is the former military fort in Marfa, Texas which was purchased and turned into an ensemble of contemporary art by Judd in 1971. Indebted to the use of material and form, the furniture items presented are designed for serviceability. Their formal affinity to Judd's sculptures is clearly recognisable throughout.

#### Louis Kahn – Essential Texts

Editor: Robert Twombly  
W. W. Norton & Company; 2003  
ISBN 0-393-73113-8

In this book, Robert Twombly, History of Architecture Professor at the City University of New York, presents a unique anthology of speeches, essays and interviews, some previously unpublished, with and by Louis Kahn. Over 256 pages, the book captures the evolution and central tenets of Kahn's thinking from 1940 up until his death in 1974. Robert Twombly's introduction and headnotes offer incisive commentary on the verbal and written works of the great American Architect.

### 2 PAUL DIEDEREN AND BERT DIRRIX RECOMMEND

#### Dom Hans van der Laan

Author: Alberto Ferlenga  
Architectura & Natura Uitgevers  
ISBN 9076863059

There are few 20th century buildings in which simplicity, harmony and the endeavour to achieve perfect proportions are as clearly evident as in the works of the Dutch priest, theoretician and architect Dom Hans van der Laan (1904–1991). The authors Alberto Ferlenga and Paola Verde spent a lot of time working in the Vaals Monastery near Aachen, which houses most of the van der Laan archives. Their book succeeds in making the often highly abstract and mystic themes underlying van der Laan's theories accessible and generally understandable. The monograph also contains a complete and copiously illustrated overview of van der Laan's completed building projects and an exhaustive resumé of his life.

#### Atlas of the Dutch Urban Block

Authors: Susanne Komossa, Max Risselada  
Thoth Uitgeverij  
ISBN 9068683829

In this design atlas, Susanne Komossa and Max Risselada provide an overview of the urban residential block in Amsterdam and Rotterdam from the 17th century to the present day. 19 urban fragments are examined with the aid of floor plans and sectional views. The drawings cast a whole new light on the relationship between public and private space, and between individual dwellings, residential blocks and urban districts. The most up-to-date projects featured in the book include the regeneration of Rotterdam harbour and the urban development plans for Java Island in Amsterdam. Numerous essays also provide an insight into contemporary developments taking place in the world of architecture and urban planning.

#### The Capsular Civilization

Author: Lieven de Cauter  
NAi Publishers  
ISBN 9056624075

The 11 September attacks and the international war on terror accelerated a development which had already long been a latent force in an era marked by social injustice and ecological disasters: The domination of many people's lives by fear, and the gradual withdrawal of individuals within their own four walls. In his book, Lieven de Cauter documents and analyses social change since 9/11. De Cauter sketches a realistic and alarming account of the new world order that is an everyday concern for the architects and planners of the contemporary city as well as for its inhabitants and users.

#### Richard Hutten: Works in Use

Author: Brigitte Fitoussi  
Stichting Kunstboek  
ISBN 9058561763

At the age of not quite 38, Dutch designer Richard Hutten has already succeeded in making a lasting impression on the international design world. Plans exist for a design academy bearing his name to be opened in Seoul in 2008. Many objects designed by him, such as the Bronto chair or the Domoor cup, have achieved huge commercial success. Hutten is also involved in interior architecture, and is responsible for the restaurant, the garden furniture and the bookshop in the Central Museum in Utrecht. Hutten's designs, which he himself terms "works in use", are known and loved by many, including a number of famous contemporaries. This book is the first publication to provide an insight into the world of the designer and describes how celebrities live with his designs.

### 3 MANUEL AND FRANCISCO AIRES MATEUS RECOMMEND

#### Imaginar a Evidência

Author: Alvaro Siza  
Edições 70  
ISBN: 9727085210

From his early projects in Portuguese Matosinhos to his later work across the length and breadth of Europe (from Berlin to Lisbon and from Den Haag to Barcelona), Alvaro Siza created some of the most important structures of the 20th Century. Many of them feature in this deeply reflective and sometimes poetically written autobiography. The origin of the book is a highly complex one: *Imaginar a Evidência* is a translation back into Portuguese from a transcription in Italian by the architect Guido Gregorio of three tapes originally recorded by Siza in his studio in Porto.

#### O Engenheiro do Tempo Perdido

Author: Pierre Cabanne  
Assírio & Alvim (Arte e Produção, 4)  
ISBN: 9723702576  
English edition:  
*Dialogues with Marcel Duchamp*  
Da Capo Press  
ISBN: 0306803038

"One of the most radical movers in the art world of the 20th Century, Marcel revolutionised the perception of art: his objet trouvé, the urinal in the museum, was the forerunner for a countless stream of other everyday objects and items of garbage which he pronounced works of art. In 1966, two years before his death, Duchamp granted the author Pierre Cabanne the interview transcribed in this book. It goes some way towards unravelling the myth surrounding Duchamp's non-art. The reader is quickly made aware of how little respect Duchamp had for the art establishment (although he used it to his advantage) and how little he valued art that appealed to the eye. *Dialogues with Marcel Duchamp* is a frank and honest book that requires no interpretation by art critics.

#### O elogio da sombra

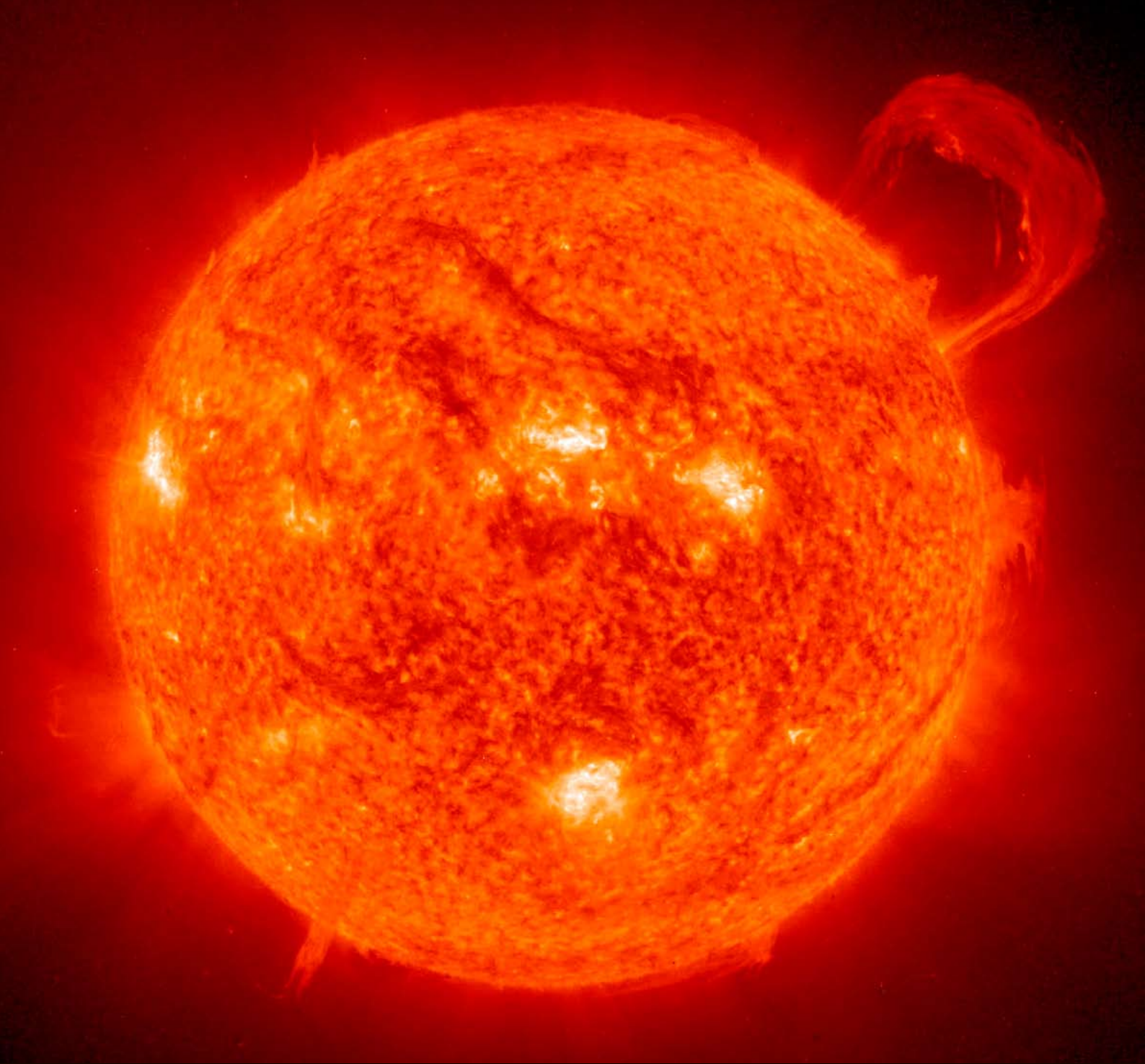
Author: Junichiro Tanizaki  
Relógio d'Água  
ISBN: 9727085210  
English edition: *In Praise of Shadows*  
Vintage; New Ed edition  
ISBN: 0099283573

The essence of this comparative view by Japanese author Junichiro Tanizaki of western and traditional Japanese concepts of beauty is perhaps best illuminated by its subtitle, *The Concept of Japanese Aesthetics*. In *Praise of Shadows* was published in 1934, at a time when traditional Japanese architecture and with it the cult for the considered deployment of shadow and imperfection was on the decline in the Japanese culture. Particularly for western readers, Tanizaki focuses the view of differences between the two cultures in their treatment of light, colour and materials – and even of the human, in particular the female physique.

#### Thinking Architecture

Author: Peter Zumthor  
Baden, Lars Müller  
ISBN: 3764361018

Architecture whose purpose is to design buildings with a sensuous connection to life calls for precision of thought transcending the boundaries of form and construction. The writings of Swiss architect Peter Zumthor express his motivation in designing buildings that speak equally to our feelings and understanding. The new 2006 edition includes three new essays: *Does Beauty Have a Form?*, *The Magic of the Real*, and *Light in the Landscape*.



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**DAYLIGHT &  
ARCHITECTURE**  
ISSUE 06  
2007



**DAYLIGHT & ARCHITECTURE**  
**MAGAZINE BY VELUX**  
SPRING 2007 | ISSUE 05

Publisher  
Michael K. Rasmussen

Website  
[www.velux.com/da](http://www.velux.com/da)

VELUX Editorial team  
Christine Bjørnager  
Nicola Ende  
Lone Feifer  
Lotte Kragelund  
Torben Thyregod

E-mail  
[da@velux.com](mailto:da@velux.com)

Print run  
90,000 copies

ISSN 1901-0982

Gesellschaft für Knowhow-  
Transfer Editorial team  
Thomas Geuder  
Annika Dammann  
Jakob Schoof

The views expressed in articles  
appearing in *Daylight & Architecture*  
are those of the authors and not  
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Translation and re-write  
Tony Wedgwood

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Photo editors  
Torben Eskerod  
Adam Mørk

Art direction & design  
Stockholm Design Lab ®  
Sharon Hwang  
Kent Nyberg  
[www.stockholmdesignlab.se](http://www.stockholmdesignlab.se)

Cover photography  
*Hands, 1997*  
by Gary Schneider

Inside front cover photography  
Orion Nebula. Image by the  
Hubble Space Telescope  
Photo: NASA