

DAYLIGHT &  
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## VELUX EDITORIAL

### DAYLIGHT SPECIFIC TO PLACES

PHOTOGRAPHY BY JOSEF HOFLEHNER.

According to ancient Roman belief, each independent living being – human or animal – has a 'genius' or protecting spirit that keeps it alive. 'Genius loci' is the spirit of a place – the sum of its visible and invisible characteristics. Throughout history, these characteristics have inspired architects and architecture that sought to be in harmony with its place. Nowadays, there are many aspects relating architecture to genius loci: the form of a building, the choice of materials, its relation with its boundaries and local climate conditions and, thereby, the way it is daylight and ventilated.

But how does the daylight situation in specific locations influence the life of people; and, in turn, how does architecture relate to local daylight conditions? Daylight is one of the most unique and location-specific characteristics of a place. Landscapes can be flattened and open spaces can be concreted over, building materials are now almost infinitely available and historical events are gradually forgotten. But daylight can neither be exported nor standardised; the midnight sun of Scandinavia or the midday sun in the Andes, which causes all shadows to disappear, will always be specific to the place.

We asked five architects who teach at schools of architecture and universities, and who all functioned as supporting teachers for participating students in the International VELUX Award 2008, to explore the daylight in their different parts of the world – Hangzhou, Eskisehir, Lisbon, Oslo and Charleston. They observed the specific virtues of daylight at each of these locations and investigated how traditional builders and modern architects have made use of it in their buildings.

Gerhard Auer and Nick Baker examine our topic from the perspectives of an architecture theorist and a physicist respectively. Auer's reflections focus on the place that is most intimately familiar to everyone, our own home. In his article 'What living light could be', he has looked at those basic functions of living that span epochs and cultures. He searched for the light that is most commensurate with these functions. Baker starts off entirely without buildings: our genes are those of a creature of the great outdoors, and buildings should separate us as little as possible from nature. The dogma of maintaining a constant indoor climate with uniform lighting levels is outdated, since scientists have demonstrated in numerous studies mankind's ability to adapt. Both writers point out how important a view over green fields is for our well-being. This in turn serves to emphasise that the primary service of architecture should still be to underscore our sensory perception of a place and encourage the direct interaction between man and his environment.

Sanatorium Zonnestraal and the van Nelle Factory are both iconic examples of the interrelation between architecture, location, daylight and indoor climate; generous and beautiful spaces that make people feel the particularity of the place through daylight. An interview with Wessel Jonge, the architect in charge of the restoration of the two buildings, concludes this issue.

The van Nelle factory in Rotterdam will house the third VELUX Daylight Symposium in May 2009 and Nick Baker and Wessel de Jonge will be among the speakers.

Enjoy the read!

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**NOW**

New daylight projects: I.M. Pei has constructed a crystalline structure under the desert sun of Abu Dhabi, Jean Nouvel a Grotto in White in the docklands of Le Havre, the new ramparts of Granada resemble a light filter and the GreenPix media facade in Peking uses the energy provided by daylight to bring video art to the streets.



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The house of Alan Jones in Randalstown appears big, gloomy and windowless from the street. Its black fibre cement cladding brings the traditional slate facades of Northern Ireland to mind – its size and shape are reminiscent of the churches and meeting-houses of the neighbourhood. But the inside of the building surprises the onlooker by its openness, the views and a design concept that makes room for daylight.



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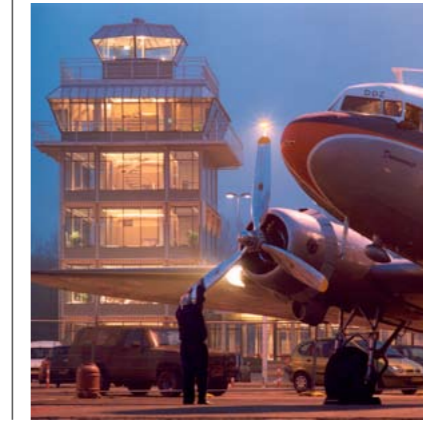
What sort of light do we want to live with? You might think that the answer to that would be "that depends". But beyond all individual and cultural differences, certain timeless factors constantly crop up all over the world when dealing with residential light. Gerhard Auer has gone in search of these constants.



PHOTOGRAPHY BY BEATRICE MINDA, MASSY-PALASEAU, 2005

**VELUX DIALOGUE  
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Nobody is more familiar with the buildings of Dutch modernism than Wessel de Jonge. Over the past few years, the Dutch architect has restored buildings by Jan Duiker, Gerrit Rietveld, Brinkman & Van der Vlugt and others. Here in Daylight & Architecture he talks about daylight and comfort in classically modern architecture and about the challenge of finding contemporary forms of utilising buildings from the 1920s.



**VELUX PANORAMA  
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The architects frundgallina focused on a private townhouse in the small Swiss town of Le Landeron, creating a white light-filled, open living space, set off by dark wood, with an interior geometry that has broken free of the house's external walls. As these walls had only very few openings, two rows of roof windows now channel daylight deep into the top storey.



**MANKIND  
AND ARCHITECTURE  
LIGHT AND PLACES**

**8**

Light is... different. Again and again and always. Every place, every time of the day and every season produces its own atmospheric light – that is the most important lesson that architects have learned over the thousands of years in which they have been working with daylight. In her article, Marietta Millet talks about how they worked and the answers they arrived at in response to the delicate differences in light.



PHOTOGRAPHY BY JOSEF HOEFLNER, NIAGARA FALLS, STUDY 4 - ONTARIO, CANADA

**DAYLIGHTING  
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We asked five architects who teach at schools of architecture and universities, and who all functioned as supporting teachers for participating students in the International VELUX Award 2008, to explore the daylight in their different parts of the world – Hangzhou, Eskisehir, Lisbon, Oslo and Charleston. They observed the specific virtues of daylight at each of these locations and investigated how traditional builders and modern architects have made use of it in their buildings.



# NOW

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

An architectural jewel – I. M. Pei's new Museum for Islamic Art in Doha. Daylight enters the building through a small oculus from above and is reflected by the faceted cupola of steel.



PHOTO: COURTESY OF THE MUSEUM OF ISLAMIC ART

## JEWEL IN THE DESERT SUN

The true art of gemstone cutting is to turn the originally drab rough stone into a sparkling work of art by crafting its surfaces. The more complex the geometry applied, the more facets the stone will have, and the more impressive the end result will be. In architectonic terms, I.M. Pei's new construction for the Museum of Islamic Art in Doha is such a precious stone, despite its cladding of opaque French limestone. Its sharp-edged, regular yet complex form seems especially suited to creating unforgettable geometries of light and shadow in the blazing Arabian sun. The play of light and shadows continues within the almost 50 metre-high atrium. Daylight enters through a relatively small oculus right at the top of the building, and is reflected in a faceted stainless steel dome. In many respects, the museum is a typical Pei creation – monumental, monolithic and windowless apart from an opening in the north side that reaches almost to the full height of the building. Nevertheless, the veteran architect, born in 1917, was anxious to adapt his use of forms to Islamic tradition: "It seemed to me that I had to grasp the essence of Islamic architecture. The difficulty of

my task was that Islamic culture is so diverse". Strongholds in North Africa and a fountain in the inner courtyard of the Mosque of Ibn Tulun in Cairo were important sources of inspiration for his design. As with the fountain, the forms in I.M. Pei's museum were to stand alone, pure and unornamented. While the external construction is true to this conception, the atrium, with its concrete coffered ceiling and multicoloured stone floor, is more obviously in line with the tastes of the client. The building stands on a specially created artificial island 60 metres offshore at the south end of the Bay of Doha. A 45 metre-high glass curtain wall to the north side of the atrium provides the only visual link between the museum's interior and Doha's skyline. No sunbeams, however, penetrate into the exhibition rooms, which are arranged around the atrium in five storeys. They were furnished using porphyry, valuable Brazilian wood and stainless steel mesh based on a design by the French architect Jean-Michel Wilmotte, and are lit electrically to the optimal degree for the artworks.

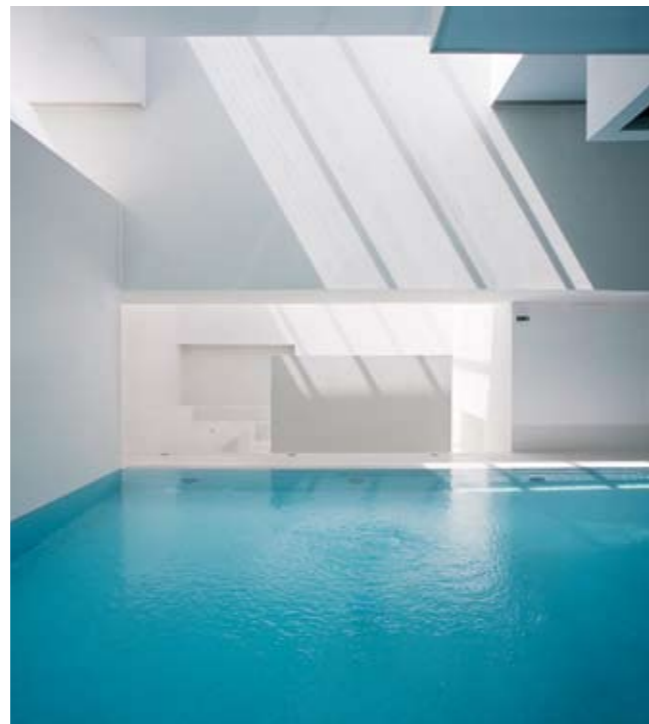


PHOTO: CLEMENT GUILLAUME

## GROTTO IN WHITE

Like many seaports, Le Havre, France's second-largest harbour town, continually reaches toward the sea. New quays are presently being built out of town at the mouth of the Seine for supertankers and container ships. The docks closer in to the town, on the other hand, are largely standing empty, waiting to be put to new use. One example of this is Jean Nouvel's Bains des Docks. The exterior of this massive block, made from gleaming black glazed pre-cast concrete parts and with irregular aluminium windows, would fit into any future office or commercial district as seamlessly as it fits into the harbour district. The interior, however, avoids conformity, with a fascinating and occasionally irritating multiplicity of rooms and corridors, pools and sitting and reclining areas. The only ordering element – apart from the building's overall cubic form – is the large 50 metre pool. This is inside the building, but in the open air. The white-painted facades that surround it, with their niches and irregularly distributed windows, demonstrate what Nouvel aimed to produce through his design: a sculpture on a grand scale but intricately detailed, whose nooks

and crannies offer visitors all the seclusion they need. While many of his colleagues would like to see the right angle and bare white wall abolished, the French Pritzker Prize winner rehabilitates both to impressive effect. One of his models was Eduardo Chillida's cycle of sculptures *Elogio de la Luz*. Like the Basque sculptor, Nouvel allows daylight to fall into the interior through deep incisions in the building's shell, where it is reflected and refracted in all directions by floors, pools and seating elements laid with white mosaic tiles. As well as the competition pools, the Bains des Docks include a leisure pool with an indoor and outdoor area, two children's pools and an area for balneotherapy. The fitted-together design of the pools is largely based on natural formations in the sinter terraces of Pamukkale in Turkey. As in Pamukkale, the brilliant white surfaces and the turquoise water of Jean Nouvel's baths are the subdued colour palette against which the colourful crowd of bathers are set.



PHOTO: SIMONE GIOSTRA/ARUP/ROGU

## CULTURAL VIEWING USING SOLAR POWER

Media facades still have a rather bad reputation among architects. They are considered a non-architectonic intrusion in the architect's province that seems to proclaim, "We interrupt the cityscape for a short commercial break". They also use considerable amounts of electricity and their light is criticised for polluting the night sky. GreenPix, the media facade of the 2,200-square-metre Xicui Entertainment Complex is another matter. This artwork adorns an otherwise unimpressive complex close to the Olympic basketball and baseball stadium, but video installations by young artists form most of its output. It is coordinated by a team of several people headed by the curator and producer Luisa Gui. An even more important aspect of this project is its energy supply. The whole facade functions independently of the electricity grid. It is fed by solar cells laminated into the glass. Throughout the day, they use batteries to store electricity that powers the 2,292 colour-changing LED lights at night. These photovoltaic elements are not uniformly distributed over the facade but arranged in an irregular pattern that looks rather

like a sky with clouds. The New York architect Simone Giostra, who designed the facade together with engineers from Arup, says, "the media facade is Beijing's first facility for exhibiting digital media art and also the most radical example of integrating photovoltaics into a building to date". When he decided to specialise in integrating new media into architecture, the Italian-born architect already had 12 years of experience constructing glass facades as a project architect for the firms of Richard Meier, Steven Holl, Raimund Abraham und Rafael Viñoly. He believes the project symbolises "a commitment to integrating sustainable technology into contemporary Chinese architecture as a response to the aggressive and unregulated economic development often undertaken by industry at the cost of the environment." To ensure that the media facade, installed about two metres from the building's actual outer wall, also has structure and depth during daylight hours. Some of the quadratic, point-fastened glass panes are inclined up to 5 degrees from the facade's surface, giving the initial impression of many slightly opened windows.



PHOTO: VICENTE DEL ANO

## POROUS FORTIFYING WALL

Two of the most important Moorish buildings in Spain – the Alhambra and the Generalife – can be seen in Granada. The origins of the city, however, lie elsewhere. The oldest fortifications on the Cerro de San Miguel, opposite the Alhambra, date from Iberian and Roman times. Today the site is known as Alto Albaicín, which is derived from its subsequent Moorish name. From the mid 14th century – during Nasrid rule – this district was surrounded by a wall which played more of an administrative than a military role, delimiting the urban area and separating it from the surrounding countryside. Today, this wall still forms the boundary between Granada's inner city and the surrounding suburbs. For a long time, however, its immediate environs were decidedly uninviting. In the 19th century, part of the wall was destroyed by an earthquake. Rubble has been collecting on neighbouring land for centuries. Antonio Jimenez Torrecillas' rebuilding of the wall is part of a large-scale restoration of the whole area. The architects had 112 cubic metres – roughly 300 tons – of granite piled up until their construction was equal in height and breadth to the old wall. From a distance, it looks

like a continuation of the old wall, but seen close to it is clearly an independent construction. It follows the line of the Nasrid wall but stands on its own foundation and could therefore (theoretically) be demolished without damaging the historic masonry. Its exceptionally shallow stone courses are held together only by millimetre-thick mortared joints, giving the overall impression of a drystone wall. The wall is also hollow. Between the two wall shells is a covered walkway, which is pleasantly cool in summer. The world outside can however be seen and sensed from within it. The granite slabs are mortared in a 'spaced-out' pattern, so that the gaps between them create a lively play of light and shadows in the interior. This also means that the pedestrians passing through the spaces within the wall can catch small, localised glimpses of the city. The architects themselves explain their intervention thus: "The aim is to give the impression of material collected and piled up in order to highlight even more the permanent and historic nature of the monument."

## LIGHT AND PLACES



By Marietta Millet  
Photography by Josef Hoflehner

Daylight is probably the only medium that provides us with a sense of both place and time. For generations, painters and photographers have tried to capture the specific nature of light in different places – and architects have good reasons to do the same: adapting buildings to site-specific daylight conditions not only enriches our sensual experience, but can also lead to considerable savings in energy.

We all have experienced light and darkness. Our experience of place, our sense of place, is grounded in light and shadow, their rhythms and their patterns. It is difficult to imagine where we grew up without a vision of the sky, sunny or misty or filtering snow – or perhaps all three. Daylight with its typical patterns plays a leading role in establishing the character of a place. Even the name of a place – the Sahara Desert, Miami Beach, the Black Forest or the Swiss Alps – will bring to mind images that include the quality of the daylight. Today, when so many images are readily available on our desktop via the internet, one can view these images with ease and at any time. But mere images do not reveal the full vocabulary of daylight in any one place, a vocabulary that includes the rhythms of light and dark daily and seasonally in addition to the physical features and characteristics upon which that light plays. A single image cannot capture either the dramatic or the subtle changes that make the light of a place unique, as Monet explored so beautifully in his series-paintings, such as those of haystacks or water lilies in Giverny. That unique sense of place can only be acquired by first-hand experience.

### TIME, PLACE AND LIGHT: A RELATIONSHIP IN CONSTANT CHANGE

Although we may see the same clear blue sky in Sweden and in southern France (and indeed in many other places in the world), we will typically see this sky condition at different times of the day and year. There will also be a particular procession of sky conditions in each place throughout the course of a day and of a season. In addition to these regional patterns, there are specific identifying factors in special places within each region. On any given sunny day, valley dwellers experience fewer hours of sunshine than those who live at the top of the mountain. And along with the physical forms – mountains or valleys, forests or fields – the quality of daylight is crucial in defining a particular place.

Some locales are known for the quick and dramatic changes in weather, and thus, in the quality and quantity of the daylight: “If you don’t like the weather, wait a minute!” Other places are defined by very subtle shifts in temperature and in light that slowly alter the colour of both the leaves and the skies, fostering patience and a sense of discovery.

*Left: A mysterious light caresses the site, bringing its spirit to light. Water Walk, Japan.*

The low winter sun angles of Finland cause not only a very few hours of daylight but also a particular cast to the light, the yellow that heralds the beginning of sunset. Long shadows result from the low sun, so that buildings cast large areas of shadow. In stark contrast, there is almost no darkness during the summer, certainly not close to the time of the summer solstice. The contrast between summer and winter affects the whole approach to life, the summer hours of light considered so valuable that the workday is shortened in summer, and celebrations of midsummer night are legendary.

In the tropics, however, with the sun hanging almost directly overhead, day follows day with a certain monotony, and much-valued shadow is hard to come by. High levels of water vapour in the atmosphere create a haziness that diffuses the light, often causing glare as it hides the blue of the sky. During the last decades, we have added to these natural conditions one of man-made pollutants resulting in smog over many urban areas. This smog changes the colour and the nature of the daylight, often obscuring distant views as well as diminishing the daylight available to borrow for use in buildings.

### ‘DAYLIGHT CULTURES’ AND DAYLIT BUILDINGS

Light can be used to convey a visual message that helps alleviate the uncomfortable realities of climate. Adding a gold finish to exterior ornamental work has been used in northern locales to add contrast to otherwise dull scenes of dark skies and dark surfaces. Gold-tipped fences and domes brighten views of northern European cities, especially in winter. The resulting sparkle provides psychological relief, especially under dark overcast skies. In hot dry climates however, sunlight reflected from flat vertical surfaces is often too intense to be viewed comfortably, leading to sculpted ornament to provide visual relief.

Sensitivity to the light of a place includes its affect on us psychologically as well as physiologically. When designing a landscape or a building in a particular place, we usually start by fitting it gracefully to its site. Providing comfort for the people who will inhabit it involves our own sense of comfort and our own experience of the place, its culture and its sensory associations.





**Previous spread** A mystic scene with a suggestion of vastness and loneliness: Biwako Sticks, Japan.

**Left** The light that captures the magic of the place: *Li River Study 4*, photographed in China by Josef Hoflehner.

When we respond to the *genius loci*, we also respond to the culture that has developed around climate and light. These responses to light have often been described by writers. In his 1934 essay *In Praise of Shadows*, Junichiro Tanizaki described the traditional Japanese response to light.<sup>1</sup>

*“And so it has to be that the beauty of a Japanese room depends on a variation of shadows, heavy shadows against light shadows - it has nothing else. Westerners are amazed at the simplicity of Japanese rooms, perceiving in them no more than ashen walls bereft of ornament. Their reaction is understandable, but it betrays a failure to comprehend the mystery of shadows. Out beyond the sitting room, which the rays of the sun can at best but barely reach, we extend the eaves or build on a verandah, putting the sunlight at still greater a remove. The light from the garden steals in but dimly through paper-paneled doors, and it is precisely this indirect light that makes for us the charm of a room.”*

Tanizaki makes it clear that the entire design and structure of the house, including all materials, together develop this special quality of light. Responding to the climate is also part of this approach, as the paper-panelled doors need to be protected by the broad verandas from driving monsoon rains. Special responses and rituals to warm the occupants in winter were also developed, such as the fire pit with its warming robe and the communal hot tub.

The Canadian architect Arthur Erickson has written eloquently on the quality of light in the Pacific Northwest, and how he has responded to it in building. “The West Coast is a particularly difficult area with its watery lights, which are capable of soft and subtle moods.”<sup>2</sup> He describes this as northern light, which “is remote and hidden above the clouds.”<sup>3</sup> In designing buildings, he has stated that he tries to achieve “transparency in buildings, or skylights bathing walls with a gentle introspective light, or water reflection to bring the sky’s brightness onto the earth’s dark surfaces.”<sup>4</sup> Reflections from the water put the sky at our feet. Water reflects the skylight and its luminous quality to the occupants of a building. The cloudy sky becomes animated, enlivening the experience of the place inside and outside.

LET THE LIGHT IN – BUT KEEP THE HEAT OUT  
Daylight also has a practical role to play in the thermal behaviour of buildings. Sunlight – as well as light from the overcast sky – carries heat. The glass that admits the light also admits heat or allows heat to escape, so it is not sufficient to consider only the visual aspect of daylight entering a building. A shadowed interior is often welcome in hot climates, while sunlight – in moderation – is welcome in cool climates.

There is a struggle that occurs at the window, a struggle between admitting light and admitting – or losing – heat. Le Corbusier summarised it in a short writing he called *The Problems of Sunshine*: “the history of the window is also that of architecture, ... at least one of the most characteristic slices of the history of architecture.”<sup>5</sup>

Increasingly ‘the window’ has given way to ‘the curtain wall’. Glass wraps buildings, and the entire building becomes the window. New technologies in structure and materials have opened doors to new responses to the site, even in harsh climates. Still the most satisfying buildings respond sensitively to the spirit of the place. The quality of the light is taken into account at the beginning of conceptual design and considered throughout the design process. The building is sited to take advantage of the type of daylight needed in each area or room, balancing visual comfort and light for the task with thermal concerns. It is a delicate process, and various types of shading or specific site treatments or glazing types – or all three – may be needed. And these aspects must all fit into the design concept – or better yet, arise out of the design concept. If designing for daylight is not a strong driving force in the design concept, it is never going to emerge as a significant or successful aspect in the experience of the building.

#### A MATTER OF DESIGN, NOT TECHNOLOGY

Here technology should not be confused with style. Buildings using the latest structural and materials technology can be exquisitely responsive to the site and the *genius loci*, as in the Paul Klee Zentrum (Renzo Piano Workshop, 2005) in Bern, Switzerland. Piano addressed this in his first letter concerning this potential commission: “. . . I feel the spirit of the place, of the land, lies in the gentle slope of the hill. . . . An architecture

of the ground, first, on which we can then build an architecture of stone and clear light.”<sup>6</sup>

The tripartite building form responds to and blends into the shape of the nearby hills and also addresses the busy highway running in front of it. The daylight comes in fluidly, gradually reduced as it reaches the galleries with the most light-sensitive works “. . . where the daylight that trickles in through the roof is regulated and dampened.”<sup>7</sup> Light is used for visual activities and also to establish moods: bustling in the open public areas, and sober in the ‘twilight museum’ where visitors feel far removed from everyday life. The careful use and control of daylight creates its own sense of place inside the complex as well as responding to the *genius loci*.

A very different concept drove Piano’s design of the addition to the Morgan Library in New York City (2006), appropriately, that of the urban piazza. Here the simple glazed building envelope provides transparency and connections for the buildings of the Morgan site as well as the streets of the city. The daylight is tempered by the surrounding buildings, but the sunlight breaks through to enliven the piazza, connecting inside and outside.

In Australia, Glenn Murcutt has been designing residences that seem to be the epitome of a sensitive response to both the spirit of place and to its practicalities. As defence against the sun, he opens a parasol to cast shade over a platform, adding partitions and shading to further establish habitation. Some of these houses, isolated, are completely self-sustaining. The buildings also have to ward off and resist the danger of brush fires, so roofs are shaped to shed leaves that might otherwise rest there. The buildings respond to both life-sustaining and threatening aspects of the place.

#### ENERGY AND THE ‘GENIUS LOCI’

These innovative ways of responding to spirit of place both practically and experientially are useful models for architecture now and in the future. It seems apparent that we are going to have to make do with less. And yet we still need light to see and to perform visual tasks. The use of daylight allows us to continue working – and playing – when electrical energy for lighting is not available. We may delay arriving at the point of having insufficient energy for our needs by using less of it

to make buildings habitable. Richard Taylor wrote in 2007 that “we estimate that the planet today uses approximately 40% more electrical energy for lighting than would be required if daylight – and presence detection devices were deployed with regularity and not only in exceptionally prestigious projects.”<sup>8</sup> And this saving can only be realised if daylight is available inside the building, and available in an appropriate and sensitive way so that it is both welcome and also useful. And when it is available, daylight can not only allow us to read or view art or assemble machinery; it can also make that experience more pleasurable. But the use of daylight only reduces the overall energy cost for occupying the building when it is used in balance with the climate, with the place.

Glazing technology has come a long way in allowing more extensive use of glass in buildings without adverse heat loss or gain, and so it becomes more important that the design of the entire building – starting with its relationship to the site and ending with details such as the precise design and control of shading devices – respond appropriately to the site and to its light.

After all, daylight is useful for more than seeing.

*“... architecture, beyond providing physical frames for human activities, also interprets to human beings their place in nature and society.”<sup>9</sup>*

**Marietta Millet** is Professor Emerita at the Faculty of Architecture of Washington University, where she taught above all in the fields of light and colour, daylight and artificial lighting as well as climate design. She was a partner in the office of Loveland/Millet Lighting Consultants and is the author of the book *Light Revealing Architecture*, published in 1996 by Van Nostrand Reinhold.

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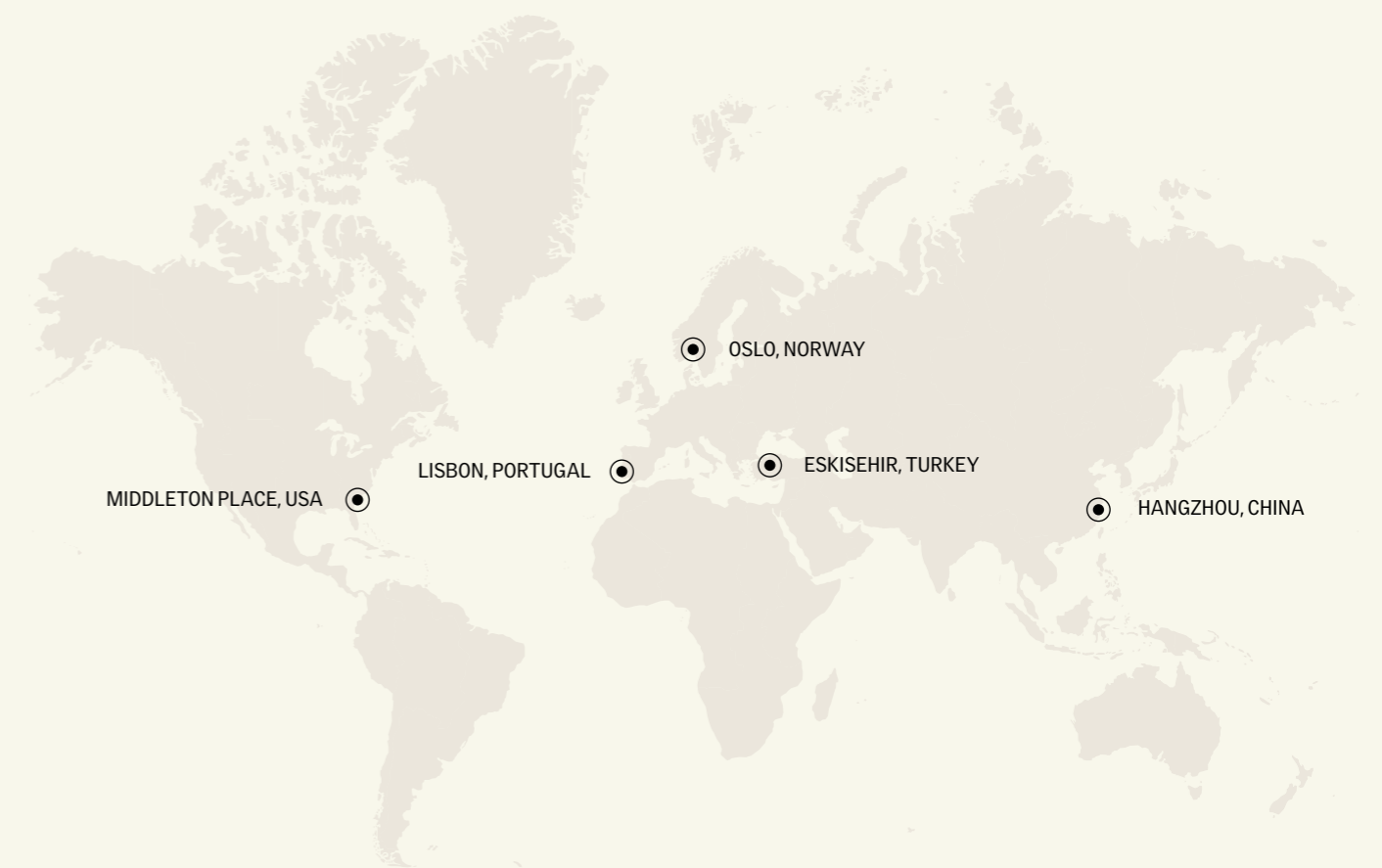
# LIGHTS OF THE WORLD

BUILDINGS ONLY BECOME architecture through specific references to the place where they are sited, just as places are unique by virtue of their light and climate. Architecture is thus always an attempt to find an answer to natural conditions. Buildings on the coast look different from those further inland, houses in the river valleys of the world are constructed differently from those built in mountainous regions, and buildings of the north differ dramatically from those in subtropical regions.

The following 24 pages show the results of a voyage of discovery to five different places on the globe. We asked five architects who teach at schools of architecture and universities, and who all functioned as supporting teachers for participating students in the International VELUX Award 2008, to explore the daylight in their different parts of the world. Their task was to document a place, chosen by themselves, and its specific daylight, and to record how man and architecture had responded to these natural conditions. The contributions show that architecture that responds sensitively to daylight has

always existed and continues to exist up to the present day. They also demonstrated that, in architecture, daylight cannot be viewed in isolation – it always exists in close reciprocity to the climate and topography of a place, to the surfaces of nature and architecture, even to local history and the everyday habits of local inhabitants. The introvertedness of Chinese residential houses and the openness of modern post-war American buildings tell of cramped city conditions and vast landscapes, of different social structures, but also of different attitudes of people to daylight. Even the *azulejo* facades in Lisbon originally evolved in response to Portugal's rainy climate. But they have since gone on to significantly shape the cityscape and 'atmospheric light' of the city on the Tagus.

But enough of these preliminaries. Read on to learn about other shades of daylight discovered by our authors on their travels.



# Thoughts on the light in Oslo

BY ROLF GERSTLAUER

*Light is, ... and is not the same.*

In the same way as it is not possible to generalise about the relationship different cultures have to the light, the quality of light also differs from place to place and from time to time. The only way to really understand the light specific to any particular season or location is to discover it for yourself.

This voyage of discovery through Oslo was made on seven different days in January 2009. The different backdrops chosen are the ordinary settings encountered in day to day living, as well as rooms and spaces I was involved with at the given time in my professional work as an architect. My observation and research of the light in January confirmed what I already intuitively knew about the quality of daylight in Oslo. At the same time, it demonstrated once again what an inexhaustible design medium light can represent for an architect. Light is never exhausted, it is the ultimate creative material available to an architect in the conception of rooms and buildings, which inextricably ascribes an architectural work to its location and makes it unique.

*Light shines, ... and shines less.*

The 'Nordic light' is long-lived and has a weak, almost intangible pulse. In contrast to the Graubündner Alps, where I come from, the dramaturgy of the light does not use striking contrasts, pulsing rhythms and varying intervals as its tools but instead speaks seldom and only in a whisper. It is evenly balanced, monochrome and unobtrusive but solidly dependable. It is light which is both democratic and transparent.

The day will unfold as the morning has promised. Clouds are either high up in the sky and remain there, or they stay away the whole day, failing to penetrate into the inner reaches of the Oslo Fjord. In contrast to the west coast of Norway, storms and dramatic turns in the weather are a rarity in this part of

the world. The appeal of Oslo's daylight is not its capacity for the spectacular or as the focus for speculation. It only evolves upon closer acquaintance.

Making that acquaintance is, by its nature, a process based in dialogue. To gain an intimate knowledge of the light, it is generally speaking not enough to assume the role of a mere spectator. In the winter time particularly, but not exclusively, considerable effort must be invested to encourage the light, reticent and lacking in pathos as it is, to really express itself. Given the scarce nature of its appearances in Oslo in January, when it does shine it demands to be seen.

*Light is, ... but rarely alone.*

Customs and behaviour patterns in Northern Europe are additional factors that decisively influence access to the light. The need to provide a barrier between interior spaces and the inhospitable climate meant creating a compact and completely enclosed building envelope, save only for a chimney to ventilate the fireplace. Daytime and night-time stayed outside with the inclement weather, while the flickering, warming, drawing light of the fireplace stayed inside. Still today, even when modern methods are used to build on open land, Norwegians tend to view openings in the outer envelope primarily as an extension of the inner space towards the view outside. The view is absorbed into the interior as a neatly framed and often spectacular, ideally untouched piece of nature, while the tentative light does not always succeed in falling with any authority into the inner space.

The fireplace as the central gathering point still remains a guiding model today, albeit in a modern guise, for the lighting inside the home. On the European continent, penetrating white artificial light fastened on the ceiling is used to 'extend the day' after the fall of darkness, while Norwegians,

even during the daylight hours, tend instead to use multiple, usually mobile sources of artificial light (also candles) to echo the soft, muted yellowy-orange lighting ambience of the living, warming fire. The low cost of electricity allows lights to be left on in all rooms, leaving the window in the role not so much as a source of daylight but as a framed picture of the view featuring different, 'abstract' lighting situations. So to really maintain a dialogue with the light, sometimes the light has to be switched off.

*Light is, ... and moves us.*

Town dwellers might be forgiven for thinking that in winter it never really gets light, and in summer it never actually gets dark. Over the course of the year, the path taken by the sun seems to create two separate worlds which either have Oslo blossoming into life or going into hibernation. But getting to grips with the nature of the light at specific times and in specific places brings another aspect to mind. It is precisely the delicate, subtle and almost imperceptibly slow transformation that is an inherent characteristic of Oslo, bathing the city in a new light from day to day.

This subtlety is both intensive and insistent. The dramatic effect of the light is not tied up in the change of seasons, but in the sudden and conscious experience of a colour, a shape or a reflection – an allusion to something that was not there yesterday or even two hours ago, not in the same way and not in the same guise. What appeared two-dimensional and without perspective has transformed into something which is spatial and distinctly graphic.

This realisation is as sudden as the change from one state to the other is difficult to pinpoint. The sea, only minutes ago grey and lifeless as it had remained for weeks, now appears in a deep rich green, saturated in colour and vitality. The ground in

the city, always dark and wet in January, is touched by streaking sunlight, creating reflection and refraction in the windows which join the endless shadows cast by the trees in a dance of light and shade, bright and brighter, top and bottom, until finally the laws of gravity appear to have been lifted and the ground is competing with the sky for space.

The voyage of discovery through Oslo's daylight ended in the new exhibition pavilion designed by Sverre Fehn for the Oslo Architecture Museum. It is a room which moves in and with the light and reinvents itself constantly: A room functioning as a light machine which instinctively knows how to open itself up to the light, incorporating every last one of its subtle nuances.

**Rolf Gerstlauer** is Professor at the Oslo School of Architecture and Design. In his own studio Gerstlauer Molne (established 1992), he is concerned not only with architecture but also works extensively in the field of photography and experimental film projects. The buildings and films produced by Gerstlauer Molne (the latter under a pseudonym) have received widespread publicity and received multiple awards.

**P 18: 5 January 2009**

13.34 – 13.39; district of St. Hanshaugen, exterior  
Sun: sunrise 09.16 – zenith 12.23 (height 7.4°) – sunset 15.30  
Climate: cloudless, temp. –6.1°C, rel. humidity 84%, surface: ground frost

**P 19: 6 January 2009**

09.35 – 09.39; district of Frogner, interior  
Sun: sunrise 09.15 – zenith 12.23 (height 7.5°) – sunset 15.31  
Climate: light cloud, temp. –4.9°C, rel. humidity 80%, surface: bare

**P 20–21: 19 January 2009**

15.57 – 16.09; district of Kvadraturen, interior  
Sun: sunrise 08.57 – zenith 12.28 (height 9.6°) – sunset 15.59  
Climate: overcast (snowfall), temp. –0.2°C, rel. humidity 90%, surface: new snow (32 cm)



OSLO, NORWAY



# Implicit culture and introverted daylight

## *Two houses in Hangzhou, China*

BY RUAN HAO AND ZHANG YUE  
PHOTOS: RUAN HAO

OUR SERIES OF PHOTOS is a comparison of an old and a new building, both located in the city of Hangzhou. The old one, built in 1872, is a private villa that has now been renovated and turned into a tourist attraction; the new one, built after 2004, is part of the China Academy of Art. We assume that the old building might have been the prototype reference of the new one. Both buildings illustrate how the spatial and daylight character of the buildings of southern China has been captured, re-interpreted and maintained throughout the centuries.

The photos were taken on a normal overcast afternoon with diffuse daylight, the most typical lighting environment in cities of southern China. These buildings were created by and for this atmosphere – euphemistic and implicit.

The white exterior walls of both buildings create a solid, cold and reflective image that shows an exclusive gesture towards surrounding buildings. In contrast to the windowless exterior wall, the inner courtyard welcomes light from dawn to night-fall. The warm wooden facades that surround it on all sides express the hospitality of the building and transform light into a dramatic, vibrant element that is maintained within the courtyard. Part of the light, indirectly introduced into the rooms through the corridors, seems even more precious and pure, as if it had been baptised by the wooden facade.

Even if fashion changes, the inner cultural value of a region, its people and its architecture remains. This is also reflected in the architecture of both houses, which are based on a common spatial concept despite the fact that they were built 132 years apart: Their public, outward appearance is rather cold and indifferent, yet inside they have a vibrant courtyard that belongs to the people who own and use the building. The overall appearance of the buildings is a result of this ambiguity.

**Ruan Hao** is a MArch student at the School of Architecture, Tsinghua University, Beijing. He was a Visiting Fellow at Harvard Graduate School of Design. He was the Second Prize winner of the 2008 International VELUX Award. Currently he is working for Preston Scott Cohen, Inc. as the principal design assistant at Taiyuan Museum of Art in China.

**Dr. Zhang Yue** is an associate professor at the School of Architecture, Tsinghua University, Beijing. He was awarded Holcim Awards 2008 Asia Pacific Gold, Grand Prix of the 3rd DBEW International Housing Competition and was a finalist of the 2nd Living Steel Competition.

*Right:* Exterior wall of the old villa. The white exterior walls seem to keep the outside world away from the individual building. Even the new building is relatively more open, yet still the exclusivity remains.

*Next spread:* Courtyard – old and new. The shape of light seems intangible, yet invited into the rooms through a fixed boundary. Light can never be sensed more intensely than this, even though the sun is not directly visible.





## Genius Loci with Grits *Inn at Middleton Place, near Charleston, USA*

BY MARK MORRIS

MEMORABLE PLACES typically borrow on first impressions, associated people or the recollection of a fine meal. Few of the sites we count as personally memorable truly rely on design. I am surprised at myself for counting the Inn at Middleton Place as particularly affecting next to my favourite London and New York locales, but the inn is full of surprises. It is the last thing, architecturally speaking, one expects to find at the end of a winding gravel road over hung with palmettos and Spanish moss upriver from Charleston, South Carolina. Its formal juxtaposition with what is left of the Middleton plantation is stark. Arguably W.G. Clark and Charles Menefee's finest work together, the inn is delicately organized on a slight rise over the marshy, milky waters of the Ashley River. The project, built twenty-five years ago at the behest of a Middleton descendant, consists of a main building – an 'L' framing a tidy lawn – and a handful of satellite modules scattered nearby.

All the buildings are multi-storeyed black wood-clad cubes of windows broken up by concrete chimneys and party walls. The overall effect is Carthusian; everyone transforms into a contemplative hermit here. Narrow stairs resting on buttress-like concrete arcs link upper rooms to the ground plane. The restraint of the material palette is balanced by the effusive landscape and the visual warmth of the interiors. The guestrooms are spare but aglow with honeyed light filtering through floor-to-ceiling interior shutters (an updated vernacular feature). Variations of light and associated mood play out as certain shutters close and open and louvers angle. There are two other breeds of window stitched into the space. Thin operable casements fill thin slots acting as reveals where the black cubes make contact with concrete; the sound of rain through these is intense as these gaps act as little echo chambers. Gently bowed glass block windows form the backdrop of trough-like baths. The sandblasted blocks themselves perfectly align with grids of tile.

The 'L' terminates in a public reception room topped by a penthouse suite. An enormous chimney skewers all this, the hearths at the main floor and in the sitting room of the suite playing the 'L' game at more intimate scales, the hearth in the lobby blazes and spits like a blacksmith's forge. The suite is wrapped by a breezy balcony facing both the lawn and the river. The age-old architectural challenge about how to resolve the corner of the 'L' is given full consideration. This cross-axis turns into a haunting hollowed-out ruin framing sky and casting deep shadows to the bicycle stand below. Kudzu takes root here and spreads to cover most of the entry elevation, turning the inn into an enormous hedgerow buzzing with horseflies and sheltering sparrows.

The clientele at the inn are diverse; some are there for the history lesson next door at the plantation, others tour the gardens (the oldest formal gardens in the country) and take samples of the rhododendron, a few sporty types ply the river in canoes. All share a misplaced anxiety regarding the staying power of the place, wanting it to remain just as it is down to the old Spoleto festival posters hung above the beds, wondering aloud who the hell else fully appreciates its unique charm. What broad and profitable tourist demographic interested in antebellum grandeur really wants to stay in a brooding modern cloister when they can lodge on rice beds draped with lace in porticoed mansions just down the road? Do enough know or care that the inn received highest honours from the American Institute of Architects (the AIA citation is kept in the lobby next to memberships in the Green Hotel Association, Audubon Society and National Wildlife Federation)? Enough know. Enough seem to care.

For Alexander Pope a *genius loci* "calls in the country, catches opening glades, joins willing woods and varies shades from shades, now breaks or now directs the intending lines..." Clark

and Menefee's design and its integration with the landscape manage to quietly employ and evoke this definition to the letter. Importantly, this spirit of place is sensually augmented by more than the visual. The smell of wood fires lingers in the rooms even at the height of summer. The coolness of the tile in the bath is refreshing after a balmy walk back from the gardens or beside the pool. Taste plays its part with the inn's breakfast always served with grits, the taste for which I have yet to acquire. No matter, they are part of the place and its distinctive flavour. It is, however, the assuredness of the inn's design concept, the material craft of its execution and its contented role as a backdrop to nature that lodges in the memory.

**Mark Morris** teaches design and theory at Cornell University where he is the coordinator of the post-professional Master of Architecture and PhD in Architectural History programmes. He trained at Ohio State University and took his doctorate at the London Consortium, University of London. Author of *Automatic Architecture* and *Models: Architecture and the Miniature*, Mark also hosts the iTunes podcast series "Architecture on Air." He has previously taught at the Bartlett, Architectural Association and the University of North Carolina at Charlotte where his friend and colleague, Greg Snyder, introduced him to Clark and Menefee's work.







# Light is time *Kilicoglu brickworks in Eskisehir*

BY RECEP ÜSTÜN

THE PHOTOGRAPHS were taken in the yards of the Kilicoglu brickworks in Eskisehir, now lying empty.

Built in 1928, the factory was in production as recently as 5 years ago.

*Light is time....*

Light cannot be dimmed, and is therefore also independent of time.

Louis Kahn regards material as light without radiance.

According to him, material is cast from 'light' in the same way that iron is cast in a mould. For this reason, material has its visible states. Its many different states mean that we cannot see material as one single object.

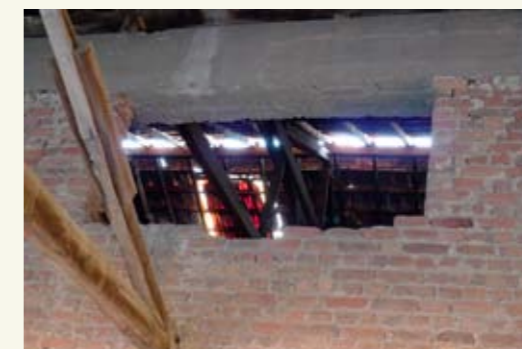
When the material/light is motionless (the state of eternity), work is at a standstill.

These photos are intended to record the tension between light and material and the effect this relationship has on places.

The transitory nature of time makes every photo a farewell. You can leave behind everything photographable.

But light remains....

**Recep Üstün** completed his studies in architecture at the Faculty for Engineering and Architecture of the University of Anadolu in Eskişehir in 1988 and has lectured there since 1989, at the same time as teaching architecture at the University of Osmangazi. He is a regular participant in national and international architecture competitions.



# Light over Lisbon

BY CARLOS LAMPREIA

"Say my soul, and poor chilled soul, what do you think of going and living in Lisbon? It must be warm there, and you would become as lively as a lizard. It is on the waterside; they say that it is built of marble, and that the people have such a hatred of vegetation that they pluck up all the trees. – Ah! There's a landscape to your liking; a landscape made with light and mineral, and a liquid mirror to reflect them!"

Charles Baudelaire, in *Petits Poèmes en Prose* [Le Spleen de Paris]

LIGHT IS ESSENTIALLY abstract, the most rarefied material that, when commingled with geographical and meteorological phenomena, develops the ability both to make architecture visible and to shape it. It is a living and unpredictable material that, when it changes, influences our behaviour and the space in which we live.

Light is above all energy, but it is also what makes a place visible and reveals it to us; it is the material that reveals all others.

Man's dependence on light is ancestral and has been represented in all cultures since the remotest times. In our days we can see it in the experimentations conducted by artists such as James Turrell. In his series of Skyspace installations, consisting of small architectural spaces designed for observing the sky, he aspires to capture and understand this light. Olafur Eliasson too recreated these phenomena in an artificial way in his 2003 installation *The Weather Project*, filling the Turbine Hall of the Tate Modern in London with intense sunlight to rapturous success with visitors.

In Lisbon, where the light is intense and amplified by the presence of water, the architecture too seems to follow art,

responding in a way that captures this energy in spaces that contain light, which makes them habitable.

The River Tagus meets the Atlantic Ocean via a small channel that joins it to the so-called Mar da Palha (Sea of Straw), an inner sea at the mouth of the river. This channel is the point of transition between the peaceful natural harbour and the Oceans. It is here too in this kneecap, on the shore that faces the sun, that the city of Lisbon developed.

Destroyed in the 18th century by an extremely violent earthquake, the city was rebuilt almost entirely and systematically in an effort of standardisation that led to a forceful uniformity, the so-called Pombaline style, that gives the city the appearance of being built of a single stony material.

It is the confrontation between these two immense masses, the city of stone on one side and the river of light on the other, that builds the image of the city and that makes possible the intense play of reflections that carries the light along the streets and alleys of the city, while we wait for the next opportunity to see the river once more. This play of light becomes apparent in the *Terraços de Bragança* housing project by Álvaro Siza at rua do Alecrim. The buildings maintain a dialogue with their Pombaline neighbours, opening gaps that reveal the old city wall. The facades are clad with glazed tiles in various shades of the colours of the sky; they reflect the light and lead it into the gaps dematerialising the presence of the buildings and introducing the sun's intense energy into the fabric of the city.

At the end of the 19th century, construction began of the immense rocky platform corresponding to the port of Lisbon, an immense rectilinear balcony leaning over the river. It acts as a mirror that reflects the bustle of industry and the port. On this platform stands the *Museu do Oriente*, a former warehouse that was transformed by João Luís Carrilho da Graça. The roof, with its juxtaposition of volumes, sets up ever-changing, unex-

pected dialogues with the container ships of the port. The introduction of golden pigment on the building provides shifting gleams and shades that emphasise the new programme.

Meanwhile, constant growth spread along the shore both to the west in the direction of the sea and to the east towards the inner sea, the Mar de Palha. An area always dedicated to intense industrial and port activity, it has been defined as an expansion of the urban fabric since the 1998 Lisbon World Exposition. Here the city becomes more exposed, the morphology becomes gentler and the stretch of water widens enormously. The light is intense and dazzling, almost preventing you from seeing the farther shore. The Portugal pavilion at EXPO 98, by Álvaro Siza, can be considered a reaction to these conditions of intense luminosity. Its immense concrete awning extended over the horizontality of the water creates a covered and cool square with a riverbank feel.

The variation in thickness and texture of the stretch of water changes with the approach of the ocean, and introduces intensities of light that make themselves felt in different ways. The expansion of the city to the west accompanies these changes, also through a suburban mass that endeavours to catch the bright light.

An example is the BRISA Control and Coordination Centre in Carcavelos by architect João Luís Carrilho da Graça. The building, which stands next to the motorway, receives and breaks up the light, both through the immense set of photovoltaic facade panels that process energy, and through the stretch of water and the white walls that define the inner courtyard and recreate the qualities of light that we have beside the river.

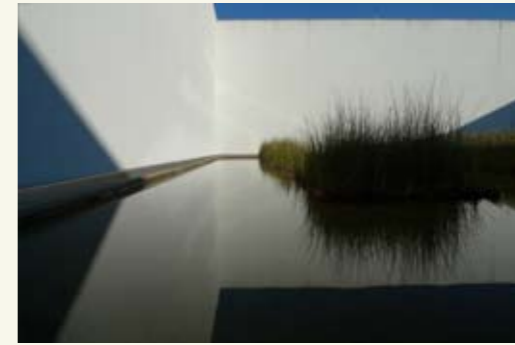
The Ocean is finally reached at Cascais, where the morphology becomes denser, and then goes on to become steeper on the Atlantic coast. Right at the entrance to the Lisbon channel stands the Santa Marta Lighthouse Museum by architects

Aires Mateus. The refurbishment of the ancient fort and lighthouse brought a new logic into the complex by covering the existing houses with white glazed tiles. The new abstract volumes follow the design of the ancient wall, transforming the whole place into a luminous unity above the black rocks.

This architecture captures and introduces into its composition the materials that make up the genius loci, from the most tangible pre-existing natural or man-made materials, to the most abstract materials such as light; but if, as Josep Maria Montaner affirms, "the mystery of the universe is the fact that it is made up entirely of concentrations of energy", then we might venture to say that the place is the means of capturing this energy.

**Carlos Lampreia**, architect (since 1990) and project teacher at FAA-Universidade Lusíada de Lisboa (since 1994), has his own office in Lisbon. He studied at Oporto Architecture School and at Lisbon Technical University FA-UTL. He holds a Master degree in architectural theory and has undertaken PhD research about strategy related to place and material in architecture and art.







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Landscapes created by  
Michael Reisch  
www.michaelreisch.com

*Previous spread:* Landscape,  
1/010 digital c-print/diasec  
2005 124 × 201 cm – courtesy  
Gallery Rolf Hengesbach,  
Cologne, Germany

*Opposite:* Landscape, 0/023  
digital c-print/diasec 2003  
124 × 190 cm – courtesy Gallery  
Rolf Hengesbach, Cologne,  
Germany

"In photography, according to convention, you always start with something real, something that physically exists. First there is the reality, the phenomenon. Thus the photo is generally a reproduction of this phenomenon. In my pictures I have inverted this fact in a certain way, I have used the reality, the phenomenon, the actually existing landscape as a reproduction, as the counterpart of my ideas. So that in the end, the authentic element of the place I have photographed no longer plays a role in the picture. This authentic element of the place is replaced by the authentic element of the picture. In other words, my pictures reveal less about what has been photographed and far more about my visual decisions. In my pictures, the place, the genius loci, is not the real landscape, but rather something in the artist's or the observer's head. As regards the

observer's subjective ideas, which indeed are in turn embedded in collective ideas (painting, literature, film, advertising, etc.) and which in the end make up something like our contemporary notion of landscape and nature, I am particularly interested in the aspect of landscape as a screen onto which you can project a collective yearning that can simply not be satisfied – landscape as a utopian, heavenly design, a dream of untouched nature, and, in contrast to this, an established, pragmatic, functionalistic and cold view of nature as raw material and commodity, as useful and available biomass: landscape between paradise and genetic engineering nightmare."

Michael Reisch



# GENIUS LUCIS WHAT LIVING LIGHT COULD BE

By Gerhard Auer  
Photography by Beatrice Minda

There is scarcely any other place on earth that people relate to more closely than their home. The kind of light that makes people feel 'at home' varies according to cultural background and individual preference. Even so, if we look more closely, we can identify basic functions of living in the sense of dwelling, and 'geniuses' relating to the light we live by that have always existed.

Only someone who immediately associates living with home, and home with constructing houses, will immediately think of lighting when light is mentioned, and then immediately think of windows and lamps on the cue lighting. But the question of what characterises living in general and how it relates to light necessarily involves some ramifications in attempting to approach a concept of 'Wohnlicht' – living light – which has so far not appeared as a chapter heading either in discussions about housing construction or about lighting design.<sup>1</sup>

#### LIVING IS...

Living adopts a wide variety of forms worldwide; these emerge from climate contrasts, different social conventions and the fact that the technology of civilization reaches different stages at different times, so any comparison seems out of the question. But considering and going beyond all cultural differences – this is what we learn from anthropology – homo habilis had to devise his own habitat because his genetic equipment does not include a nest-building programme. Since then the problems raised by accommodation have remained the same, but not the solutions. In other words: needing and dreaming about a home are the common denominator that every citizen of this earth shares with every fellow citizen. Rilke found a shared reason for this: "the great excess of outside". So I am not sketching out a new typology here, but checking concrete wishes and practices to see whether they coincide. We should not let ourselves be deceived by the wealth of different kinds of living: once they are sorted out and reduced to essentials, there are very few criteria remaining that can be called *sine qua non* conditions in terms of global and intercultural consensus, from Patagonian windbreaks to Bill Gates' cyber-mansion in the country.

#### Bodywatch

There is no theory or practice of dwelling that would not put safety aspects first, in other words defence against risks, primarily to the sleeping body, which cannot keep watch over itself in the critical state of unconsciousness it goes through every night. This requires reliable protection in the form of secure places (first cave and treetop, then bunker and tower), people or domestic animals to keep guard (nightwatchmen, guard dogs, bodyguards).

**Left Flooded with light – a safe place to sleep: photographed by Beatrice Minda (Massy-Palaisseau, 2005). Her series Interior Views includes pictures of Romanian apartments. Photographed in France, Germany and Romania.**

A secure place to sleep comes top of the list in a comparative ranking of essential living themes. From the paliasse to the futon, from the lilo to the water bed: how imaginatively they are installed at high levels, in niches and alcoves, surrounded by mosquito nets and curtains, topped with baldachins and canopies; how ingeniously they can be transported as ship-board bunks, in railway sleeping compartments and caravans (and how elaborately they are contrived for the long sleep in coffin or pyramid).

#### Egocentre

In her 1928 essay on female creativity, Virginia Woolf identified "A Room of One's Own" as an existential condition of creative force. Wanting a room of one's own proclaims the individual's right to a space for personal dispositions and freedoms: of behaviour, furnishing, opening and closing. The might of the key not only guarantees freedom from disturbance, but also offers the choice between desirable and undesirable visitors: the egocentre is not just a place of withdrawal, but also a reception room. As owners are surrounded by personal possessions there, it gives visitors insights into their character and biography.

Ethnology can tell us about rules of separation in every culture: this particular preference in terms of living space is met by our nurseries and monastic cells, by separate spaces for old people or individual rooms in a flatshare, and of course most clearly of all by a promising singles-generation's apartments. All the studios, offices or workshops that writers and artists – independent workers with hands and mind working as ego-groups – have always lived in, are also versions of shutting oneself away and making oneself available. The egocentre can shrink down to a camper van or expand to become a horse farm, but it will always be indivisible!

#### Contact zone

An encounter space – not resisting the need for separateness – becomes essential when several people live together. It is well known that cohabitation models have proliferated, from the childless couple to the family extended over several generations, and these are seen as generically typical. They combine shared work and mutual reassurance: for bringing up children

and looking after old people, in case of illness and other emergencies of a financial, physical or psychological nature.

The spatial manifestations of communication have as many variations as the nature of culture of the region lived in: as farms or halls, salons or front rooms, always subject to climatic conditions or the rules of discretion, they can turn out to be more or less transparent. But they all share a buffer function between the privacy of the egocentre and the public space of the street. (It is only in a single person's apartment that the communication space and the individual space are one and the same.) Simultaneously a crossing of the ways and a contact zone, the infranet develops richly contrasting qualities of intro- and extroversion: it is a training space for socialisation and self-control, a place for conflicts and celebrations alike, and not least it creates a show side for the street – to the extent that vain displays are accepted as politically correct.

#### Treasure chest

And last but not least, there is a fourth need that comes into this top group: concern about possessions. At first, holding supplies required storerooms and cellars, then bunkers were needed for jewellery, money and valuable collections, so treasure houses came into being. In their early forms (still surviving in Japanese or Indonesian examples) they appear as windowless, iron-clad, non-combustible and theft-proof stone or clay cubes, often centrally positioned and decorated more expensively than normal light-weight buildings for everyday use.

But only those with possessions are tormented with anxiety about loss; such anxieties start to become dominant only when people live together, whether as families or in other collectives, and especially in places where agriculture and breeding animals make a household and a fortified residence essential. People actually live in the treasure house in the Moroccan casbah: here stoutly bolted family caves huddle closely together along dark alleyways behind the settlement's fortress walls: there could be no clearer image of accommodation as a space for fear and flight. (To my amazement, we find the same fortress-within-a-fortress structures in the model of Masdar City, the most recent but concrete utopia of an "energy city of tomorrow". What fears might be driving Abu Dhabi's architects?)

Whether they are predecessors or successors of the treasure house, sea chests, safes or cases have shown their ability to travel; they continue to accompany the traveller as a homeless person when he has left or lost all his protective spaces, as containers for his last "possessions".

#### RENT A HOME

Martin Heidegger, who was sceptical about cities, idealised his look back at earth-bound agricultural communities in his – all too frequently quoted – dictum "dwelling means staying". But the realities of human habitation have always been less tightly bounded, and feelings of being at home are placeless figments of the imagination, as Ernst Bloch knew: "... there arises in the world something that shines into all our childhoods and in which no one has yet been: home."

Our discussions about living that did not start until the late 19th century were conducted by urban citizens of Central Europe, in other words by sedentary heirs of a cultural history that Vitruvius had already fixed in writing with *firmitas*: solidity and durability as primary architectural virtues. But if Eskimos, American Indians and Kirghis had taken part in these discussions, igloos, tents and folded structures would have made an appearance as the origins and ideal constructions of nomadic ways of dwelling in transportable housings.

For millions of years, early man was a wandering praecocial creature before becoming sedentary a mere ten millennia ago. Wars and itinerant activities – and today's uncertain labour markets – have made immigrants and itinerant workers move about more or less voluntarily. All those involved help each other out, if not by lending homes then by offering accommodation that is either already on wheels or can be moved around in the form of a light container. It is impossible to overlook the fact that post-industrial nomadic behaviour is on the increase all over the world, and among all classes – and with it comes a renaissance for placeless dwelling cultures. Even the furniture industry's most assiduous publicity for 'cocooning' and 'homing' cannot steer things in the opposite direction. Whether as a householder in the mean time, or a tenant, everyone changes home sooner or later. And because the largest number of today's 'inhabitants' come together in rented urban accommodation, itinerant occupants have become the furniture industry's ideal consumers.

Whether they originate from architects or designers, publications about interiors show that if the former create an interplay of light and shade from sunshine and windows, then the latter hang something on all the wall apertures, so that they can create their stage pictures among the furniture and lamps.

#### WINDOW STORIES

If we are looking for an interface between light and dwelling, the eye comes immediately to mind. It is an evolutionary constant of the species that unites us all in our sense of sight, beyond time, region or culture – and that includes optical illusions. The popular metaphor of windows as the eyes of the house contains proverbial wisdom as it describes the double task of looking out and receiving light as appositely as the ambiguous function of both separating and bringing together inside and outside. The word window also suggests that it is not just an aperture for light, but also for the weather – that means it is a border control for atmospheric phenomena that affect occupants benignly and belligerently in equal measure.

A typology of lighting – which has yet to be written – would definitely draw on two building histories: the ten-thousand-year old anthropology of the window and the history of advanced light technology, which is only 200 years old. It is striking that domestic architects did not start to pay attention to light until the early 20th century, and did not express this in their work and writings until the middle of that century. No one – as far as I know – has reflected and designed with more awareness of light than Louis Kahn. Was this why he invented the most

Beatrice Minda presents incident daylight in clear, atmospheric pictures, showing it to be a constituent element of every home. The rooms she photographs radiate a great sense of peace. Caracal, 2003.





The bright, cross-fading daylight imparts its own poetry to the rooms photographed by Beatrice Minda. Sâmbăta, 2003



remarkable windows of his day – but asked as little as possible of artificial light? His best-know predecessors in the art of daylight architecture, Frank Lloyd Wright and Le Corbusier, also shied away from light. The former flooded the old perforated housing box with sunlight while at the same time assembling its occupants around open fireplaces, and we have the latter to thank for that much quoted definition of architecture as “the masterly, correct and magnificent play of volumes brought together in light.” The three adjectives are usually overlooked, even though they are crucially significant, as another of Le Corbusier’s remarks shows: he said that a window has to look too large or too small in good architecture; if it looks merely practical, or on the correct scale, that is vulgar building!

Even though building homes is peripheral for many architects, windows do more than merely provide enough light. Correctly understood only an instrument of ambiguity, even its illuminating aperture mutates into a medium for eloquent tidings of light.

#### *Peepholes*

Cocoons have no windows. If protecting sleep is the first duty of a home, then the light needed would be good darkness. Seeing lighting design as creating darkness is not an absurd idea given the irritations of street lighting and the homemade pollution by artificial light that threatens our own interiors.

When all is said and done, even someone who is asleep does not want absolute darkness; but not even the best of dimmed lamps can compete with a skylight directed at the nuanced darkness of the night sky. A peephole looking upwards would be the only window that would do be right for a bodyguard. (Since roofs have been pierced as well, the flush window in the roof offers itself as the solution to everything, so consequently it becomes a window without qualities: is it there to let light in, or to look out of? Is it directed at the sky or the street? Is it providing light to work by or darkness to sleep by?)

But not every aperture in a wall is there to provide light: the very first one was an arrow slit; and the second was a flap in or by the entrance hatch used like the common spyhole to check on the face of the stranger knocking at the door. Any dwelling at ground level and near the street is under threat, so its peepholes have to be kept small, barred up and closed up with solid shutters at night. That is why people who live in low-rise courtyard houses add a mirador, towering over the fortress home as a periscope and raised hide.

Only when it is at a secure height can the peephole be made any bigger: then it offers deep, wide views and extends to become the horizontal slit of a picture window. A passion for seeing everything at once, which is attributed only to the character of Western dwelling, makes the whole building into a cockpit and each of its windows frames a landscape that has been ingested.

#### *Lightcatchers*

Only apertures that are above eye-level trap light effectively: skylights and glass roofs face the brightest zenith of light and draw it down into rooms further below. For a long time, resi-

dential buildings were characterised by large-scale vertical slits, while workshops and studios drew the night they needed from large glazed areas from an early stage. Admittedly, these usually had to be protected from too much sun or prying eyes by curtains, blinds or translucent paint at a very early stage.

Jorge Luis Borges called the light trap in hotter zones, the patio, a “well through which the sky is drawn into the house”. If a residential complex is grouped around a courtyard, it is lavishly blessed with constellations and cloud patterns, showers of water and an undue amount of sun, which then has to be dimmed down to shade level by umbrellas and arcades. So here the communal space raises a giant’s eye to the open sky, while sleeping areas and private rooms withdraw under the arcades and their peepholes are no longer directed outwards, but towards the middle.

Functionalistic Modernism wanted to programme the need for brightness according to use as well, just like the ground plan, but succeeded in stereotyping window patterns by standardisation and multiplication. One antidote to this is the multifunctional quality not just of contemporary ground plans, but also of facades, whose designers more and more frequently retreat to fully glazed walls for residential buildings, so afraid are they of getting the shape of the windows wrong. So it is no surprise that old versions of movable shading devices have been rediscovered and perfected technically: once occupants are able to tilt blinds and slide shutters, moderate transparency and colours, and so can choose freely between light and dark, they become the lighting designers for their own environment, responsible only to themselves.

Japanese housing traditions have useful experience to contribute here: because they have always involved multi-purpose rooms, light has always been controlled by floor-to-ceiling sliding windows and doors. They know how to switch between transparent, translucent and opaque walls, make use of the protrusions and declivities of terraces in interplay with the sun and add nuance to the darkness of deep rooms by reflection or absorption effects.<sup>2</sup>

#### *Display windows*

The very word ‘window’ suggests that not all windows are intended to admit light. Some are there only to be looked at, from the outside or the inside. Dwellings need display windows just as much as shops: a little one there, perhaps, where the egocentre opens up to visitors as a museum or a studio; definitely a big one there, where the domestic hearth makes outward show: while only a decorative living room is to be seen through Holland’s curtainless panes, villa owners have much more to show, and urban singles quite like to display their entire lifestyle through a fully glazed wall. (Small wonder that Palladio’s Villa Rotonda, theatrically combining views in and out in all directions on all its four stages, became a panoptic icon.)

The definitive glasshouse – as an extreme product which is seldom realised, but receives undue publicity – represents the climax not just of hunger for light, but also of exposure. Its apparent removal of boundaries has to be purchased by dis-



In Beatrice Minda's photographs, interior spaces stand as placeholders for the wish to withdraw, for intimacy and home. Left: Tomnatic, 2004, right: Massy-Palaiseau, 2005.

tancing (in other words the largest possible plot of land), but the inevitable modesty boundaries always have to be set up again using veiling techniques.

So whether it takes the form of the terrarium's exhibitionistic display window or the decorative veiling of an oriental harem, every residential facade becomes an advertising space whether we like it or not. When fear of the street does not allow showcases any more, the exhibition is moved behind the threshold, the courtyard becomes a show zone. The windows of Yemeni homes remain striking even though they have withdrawn to the topmost storey of a tower. This time they are veiled with glass ornaments in every possible colour, and these shine out over a great distance, and also produce powerful images inside.

#### Terrariums

The housing reformers' message of salvation "more light, air and sun" to alleviate the misery of backyard housing, along with the many voices raised on behalf of "more nature" in general, also found a ready ear in the apartments of occupants at the front of the block: they aired and lit their knickknack-laden drawing rooms, enriched their street facades with French windows, balconies and glazed verandas, right up to the roof gardens, striving to imitate the aristocracy's orangeries and conservatories. Ramblers and bathing enthusiasts explored "free" nature, then amateur gardeners brought nature under their glass roofs at home in plant troughs, aquariums and aviaries.

All that changed here over a century was that gradually rented accommodation started to sport terrariums as well, and then the suburban villas – which were actually already in leafy areas – enriched their contact zones by adding conservatories: less for the sake of a garden – they were near enough to that on the terrace – but so that they did not fall behind the contemporary trend that calls for domestic ecology in the form of solar energy.

Recently glass walls have promised to become complete power stations in their own right, making homes self-sufficient in terms of energy. Light from this aperture seems to be just a by-product of heat production, but has unintentionally beneficial consequences: the fact is that residential terrariums – actually set up as habitats for plants and animals – have helped

us to take biophysical lighting effects seriously. These always controlled human organisms as well, but it is only recently that they have been recognised as essential.

One final remark on the subject of 'windows': Alfred Hitchcock's *Rear Window* illustrates this theme better than any lecture could – a truly educational film telling us about possible aspects of housing and all the qualities of windows, but also about the risky adventure of observing and being observed. A journey round the world of living, seeing and the effects of light in two hours!

#### THE GENIUSES OF LIVING LIGHT

Without being able to ignore it altogether, a short thematic sketch like the above has to exclude the 3000-year-old discussion of light that has been conducted by philosophers and physicists, psychologists and artists, and recently by neurologists, information technologists and electronics experts, producing a gigantic encyclopaedia of speculation and knowledge.<sup>3</sup> Theories about light architecture, with their chapters on symbolism, aesthetics and application technology will not be mentioned either.<sup>4</sup>

Even Einstein once admitted his ignorance, saying that he would reflect about what light *is* for the rest of his life. But even the most clueless person can have a clear sense of, or imagine, what light *does*, in the home, for example:

1. From the first cave to Frank Lloyd Wright's exemplary designs, home life has been organised around fireplaces. Even though illumination was not the principal concern here, it was a side-effect that parted from the open flame only with the coming of electricity. Man is said to have been living by the fire for over a million years now; the cold light of discharge lamps has been shining on him for only a century. As a portable source of warmth, fire made early emigrants able to settle in colder regions as well. Their first controlled environment was not only rainproof, but could also be heated, and one beneficial aspect of the hearth fire, the first artificial light, lit their homes long before windows were added.

Our experience of sun and light has produced a stable link between light and heat in our perceptions. The tangible cooling of modern lighting devices will not change this fact,

because our bodies confirm it every day (and it can still be felt in the incandescent light bulb).

"Light is the genius of the fire process; light makes fire!" was Novalis's mysterious conclusion. The genesis of human technologies begins with controlling fire, and the new use of light on the terrain of electronics and nanotechnology indicates the start of a future that promises to become photonic. We will then come across the oldest genius *lucis* only in candle flames and open fires.

2. If our awareness of light was possessed and distracted by the visual fascination of seeing and lighting (and by techniques for making things lighter), it is now increasingly directed at the invasive dialogue between the medium and our bodies, in other words at the sun's stage directions. Frightened by neurological finds on the weakness of the human will, we are more clearly aware of circadian light compulsion, which sets time limits to our freedom of behaviour, and causes concerns for those who profit from the 24-hour day. But I find this tempo-setting currency satisfying, as it counters mankind's most-mentioned present evil, acceleration, with stabilising heliotherapy.

Recent physiological research tells us that lights from the heavens are responsible for performing immense tasks of checking and controlling our hormonal and vegetative wellbeing. Light's new somatic role is being set on a par with its optical significance. Unintentionally at first, the success of terrariums did not just open up a window on external nature, but also a window on to the interior of our bodies: living under daylight has been a self-maintenance device ever since we have known that we can do nothing better than to expose our light-hungry epidermis to this genius for as often and as long as possible. The loner who could set up his private refuge as a bio-solarium of genuine light would be a fortunate man. Once more we have new arguments for Rousseau's "back to nature" (though admittedly the cleverest thing to do here would be to work only by daylight).

3. There is no doubt that a geographically fixed place, unique for that reason alone, accommodates the genius loci that is exclusive in character as a result of the earth's history, cli-

mate or building traditions. Its blue or starry sky, its sunrises and sunsets, its cloud cover or flashes of lightning are not what creates its character: it shares those with countless building locations in habitable parts of the earth. All building means setting boundaries: lighting and overall lighting cover represent an intrusion across boundaries; all building creates heavy, motionless structures. Lights create mobility and can transform, so they are definitely spirits that contradict building, but are not adverse to living. They belong to the class of media agents that can imbue an immobile and silent constructed mass with charms: with those imponderable 'atmospheric' effects of light, colour, temperature sound or aroma that contribute more to the comfortable atmosphere of a room than the formal languages of geometry and proportion, of materials and design.

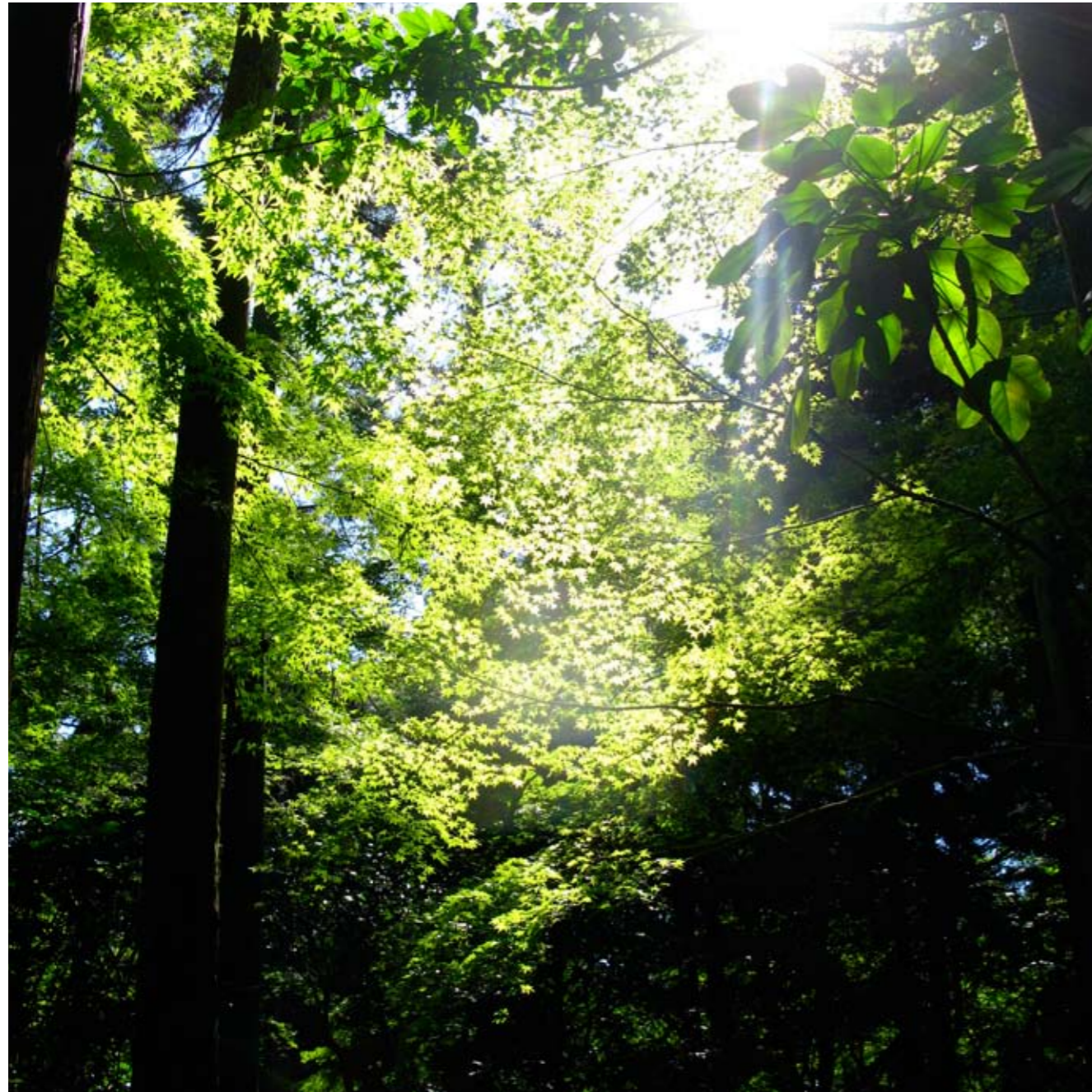
As a troublemaker, the genius *lucis* also lends earthbound people the courage to feel free to move. If an artificial habitat also needs to have its boundaries protected, then its walls must not be too heavy – they have to remain movable on the surface of our home planet. After all, its reliable fire- and sun-lights accompany us wherever we go, and they do this as chattels that are free of charge, refusing privatisation and privileges.

**Gerhard Auer** (1938) studied architecture at Stuttgart University and has worked as a free-lance architect since 1967. He held a design chair at the Technical University in Braunschweig from 1980 to 2004. He has worked intensively on the theory and practice of light in architecture and in urban spaces since the 1980s. [www.gerhardauer.de](http://www.gerhardauer.de)

#### Notes

1. One exception : "LichtEinfall" by Michelle Corrodi and Klaus Spechtenhauser (Birkhäuser, 2008)
2. See also Junichiro Tanizaki "In Praise of Shadows", Leete's Island Books 1977
3. Best interdisciplinary study: Arthur Zajonc: "Catching The Light: The Entwined History of Light and Mind", Oxford University Press 1995
4. For this see sources including publications under [www.gerhardauer.de](http://www.gerhardauer.de)

## DAYLIGHT INSIDE AND THE WORLD OUTSIDE



PHOTOGRAPHY BY BUDRN KUSOFFESKY

By Nick Baker

Over the centuries, architecture has increasingly separated us from nature and its variations in light and temperature. Yet scientific evidence shows that human adaptivity exceeds by far the assumptions made in building codes and traditional engineering. This insight might eventually not only help us build healthier buildings, but also save energy and cut on CO<sub>2</sub> emissions.

### INTRODUCTION

Although we spend 95% of our time indoors, we are really outdoor animals. The forces that have selected the genes of contemporary man are found outdoors in the plains, forests and mountains, not in air-conditioned bedrooms and at ergonomically designed workstations. Man's extraordinary ability to respond to the natural environment, has allowed him to occupy climates from the sub-arctic to the equator, long before our current reliance on fossil fuel.

Man's acute vision has played a vital role in this. For the great majority of time, this has been served only by daylight, which has thus become an inherent part of the diurnal cycle of work, rest and play. The spectral sensitivity of our eyes is almost perfectly matched to the solar spectrum, and the range of brightness with which our eyes can cope spans a million-fold range between bright sunlight and starlight. It seems reasonable, then, to suggest that we are fundamentally and genetically adjusted to daylight.

In this paper we develop the argument to explain our response to our present day built environment – which differs far more from our primitive origins than do our contemporary social and family structures. In particular, we examine our psychological and physiological response to daylight, to the relegation of daylight within buildings, and to the technologies that, due to current concerns over energy use, are once again focussing interest on daylight.

### DAYLIGHT INDOORS

From an historical perspective, it is clear that until well into the 20th century there was really no alternative to daylight. Artificial lighting was expensive – in 1900, lumen for lumen, it was about 300 times more expensive than today. Artificial lighting was unhealthy – gas and oil fumes had a devastating effect on air quality, and it was dangerous – probably the single most common source of fires in buildings. It was thus an unwelcome necessity during the hours of darkness, and no one in their right mind, would contemplate using artificial light during daytime. Even electric light, invented in 1870, took at least half a century to become widespread and, due to the technical limitations of the incandescent lamp, remained expensive. Right up to the 1950s, the admission of

**Left** Modern man now spends 95 percent of his time in enclosed rooms – and electrification uses an immense amount of fossil energy. In man's everyday life, daylight is allotted only a minor role.

daylight was a strong organising principle in building design and urban planning.

Then, with the mass-production of the fluorescent lamp, artificial lighting began to be considered as a viable alternative to daylight. Higher luminous efficacy, together with much cheaper electricity, coincided with a desire to build larger, deeper plan buildings. Together with mechanical ventilation, fluorescent lighting made this possible.

Another technological development of the time resulted in the increasing availability of large panes of glass at relatively low cost, and the structural technology to support them. One might expect that this was good news for daylighting, but ironically the highly glazed facades (as in figure 1) often had poor light distribution due to steep illuminance gradients, and required permanent supplementary artificial lighting (PSAL) to correct this. Furthermore, on recognising that these large areas of glazing caused thermal discomfort in both winter and summer, many designers switched to minimal glazing areas and relied on 100% artificial lighting. The fluorescent dark ages had begun (figure 2).

Now, 50 years on, we see renewed interests in energy use in relation to CO<sub>2</sub> emissions and global warming. In spite of dramatic improvements in the luminous efficacy of light sources of almost an order of magnitude over the last century, artificial lighting use is still a significant CO<sub>2</sub> emitter. Closer examination shows that at least half of this is due to waste – the use of lighting when there is adequate daylight present. However, great progress has been made in the development of light-sensitive controls, and the time has come, once more, for the technical value of daylight to be realised.

### DAYLIGHT IN HOUSING

Lighting design has received most attention in non-domestic buildings, probably because, firstly, non-domestic buildings tend to be occupied in the day time and, secondly, the building operator is keen to provide an environment that is comfortable and productive. Housing, on the other hand, is occupied at night (as well as by day), and is much more in control of the occupier anyway. Furthermore, the smaller room sizes generally mean that providing sufficient daylight presents little challenge. However, in the UK for example, there are long standing

**As the sensitivity to ecological concerns and energy uses grows, daylight should also be accorded a greater importance. The effect that light and our closeness to nature have on our health should not be underestimated.**

recommendations and in some cases, mandatory requirements, e.g. a minimum of 2% Daylight Factor for kitchens, 1.5% for living rooms, and 1% for bedrooms.

It is not only room and window design that effects daylight availability. Urban design influences the availability of daylight at the building envelope. After a period of low density urban planning, attention is currently re-focussed on high densities, strongly associating them with sustainable low carbon design. It turns out that at the densities being considered (50–100 dwellings per hectare), the established criteria for daylight are quite difficult to achieve. Figure 3 shows a study carried out for a new development area in Leicester, UK, using digital analysis of 3-dimensional digital models to map the Sky View Factor (svf). This is a measure of the exposure of a point to the open sky, and thus indicates the potential for daylighting. Interestingly, it was found that due to the heterogeneity of the formal massing of the buildings, there was a wide variance in svf, but this could usually be compensated by an appropriate design response for each situation.

Higher densities will undoubtedly challenge the ingenuity of both architects and component manufacturers, and make demands for sound knowledge of the physics of daylighting design.

#### ENVIRONMENTAL COMFORT

Our modern indoor lifestyle is consuming massive amounts of fossil energy, simply to isolate ourselves from the forces that moulded us. This is most clearly illustrated with our approach to the heating and cooling of buildings, where the engineer's mission has been to eliminate temperature fluctuations at all costs, and to seek the 'optimum environment' where comfort is guaranteed and the occupant never needs to make any adjustment. This attitude, largely based on studies of human comfort carried out in climate chambers, is now being challenged. It is observed that in real buildings people are far more tolerant of non-neutral conditions, that there is no one optimum environment anyway, and that being able to make adjustments in response to non-neutral sensations (having adaptive opportunity) is actually preferred. This new approach, known as adaptive comfort theory, means that buildings are acceptable with much less intervention from services, leading to very significant energy savings.

There is a parallel in the case of lighting in buildings, where the engineer's obsession with illuminance standards and other technical metrics has meant that it is difficult to meet the perceived necessary standards with daylight. Rather, what we see now is that the performance specification describes artificial lighting and, if we are lucky, daylight is regarded as an optional aesthetic bonus. Since there is always artificial light for back-up, the question of whether the building is really daylit becomes irrelevant.

We have experienced this directly in a survey of a group of modern libraries that, in the press, had been lauded for their good daylight design (figure 4). When, with good sky conditions present, the librarian is asked if the lights can be switched off, it is routinely refused on the grounds of "health and safety"!

#### DAYLIGHT, VIEW, AND NATURE

Adaptive comfort theory asserts that people show a much greater tolerance to variations of environmental parameters than laboratory tests might lead us to expect. This has been widely demonstrated in the case of thermal comfort. Indeed, there is much evidence to suggest that, as Lisa Heschong described in her book *Thermal Delight in Architecture* in 1979, people positively enjoy non-neutral stimuli when their cause can be identified as natural. Can this principle be applied to light?

Our sensitivity to light is different from our sensitivity to heat. Light in itself is rarely life-threatening. However, in its role as a carrier of information, it may well become critical to survival. Natural light also signals the diurnal cycle of rest and activity, preparing the human for tasks that are, most definitely, critical to survival.

But do we find responses to the luminous environment that are directly analogous to the thermal environment? A study carried out by Parpairi in Cambridge showed an unexpected result. She studied user responses to different daylight conditions in a number of university libraries. Two cases are shown in figure 5 below, one, in a study cubicle where the illumination is of high technical quality (glare-free diffuse light without the distraction of high contrast), and another close to the window where conditions varied strongly with the weather conditions and in particular the presence of sunlight.

Her findings show that the preferred condition was the second. Users found that they enjoyed the sunlit view of the River



Cam, and if the glare became unbearable they could retreat into a shaded part of the room (seen on the left of the picture). The building offered adaptive opportunity and in spite of strong stimuli of a natural origin, occupants reported a high level of satisfaction. This case does seem to be closely analogous with enhanced levels of thermal satisfaction under similar natural stimuli. However, it is more complex because of the far greater information-carrying capacity of light. It is interesting to speculate whether the result would have been the same if the idyllic river scene had been replaced by a car park or rubbish dump.

Clearly the information carried is important, even when it does not relate to the central task. We are dealing with ambience here, and it seems that ambience associated with nature is highly valued.

A striking and much quoted study carried out by Ulrich investigated the impact of daylight views on patients recovering from surgery. He showed that patients recovered more rapidly when able to view a middle distance natural scene including trees, than when viewing a blank wall (Table 1).

In a study carried out by the Hescong Mahone Group in the US using data from government learning performance tests, it was shown that for 8 to 10 year old children, annual progress in maths and English was improved from 6 to 26% for daylight spaces. The effect was observed where daylight entered via diffuse rooflights, but the largest progress was found where daylight also entered via windows.

One final piece of evidence, familiar to us all. We have often observed how in a daylight room people will carry on reading as the daylight fades at the end of the day. We have measured this, by logging room illuminance, to determine the threshold at which artificial light is finally switched on. The result is astonishing, with typical values being as low as 70 lux, 4–5 times lower than a standard design illuminance for artificial lighting. We would never tolerate an artificial lighting level as low as this (except perhaps in a romantic restaurant). This dramatically confirms our tolerance of environmental variance, when it is of natural origin.

#### THE WINDOW ON THE WORLD

The technical qualities and value of daylight are several – a free source of visible radiation, of excellent colour rendering, with

important physiological functions. But from the cases above, it seems that the information that daylight carries of its origin, may also be of psychological importance.

It is now technically possible to produce artificial light that has spectral properties indistinguishable from daylight, and it would be equally possible to create variations in intensity to mimic the natural progression of sky illuminance. But if this light were delivered through a conventional luminaire in the middle of a room, would it have the same value as daylight? Let us take this experiment further; suppose the light actually was daylight, but delivered to the luminaire via mirrors and light guides; would that realise the full value?

Finally, consider a window of nice proportions that allows a view of the sky, some trees and the foreground. The daylight falls on the light-coloured reveals and the sill, easing the eye's transition from the room's soft luminance to the bright sky, where even brighter clouds can be seen. Furthermore, let us assume the occupant knows that he or she can open the window and connect with the air outside, with the smells and sounds of the world outside.

There seems to be no contest here, and it becomes immediately apparent that the value of daylight is as much about valuing where it has come from as its intrinsic physical properties. It seems that the whole package of what the window has to offer is more valuable than the sum of the parts. Moves to separate out the function of the provision of daylight and ventilation could be attractive in terms of technical control, but may not realise the full benefit of a simple window (figure 6).

#### CONCLUSIONS

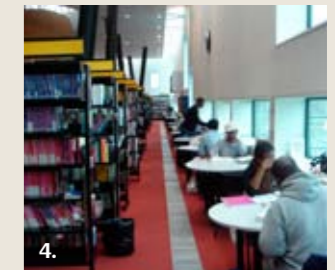
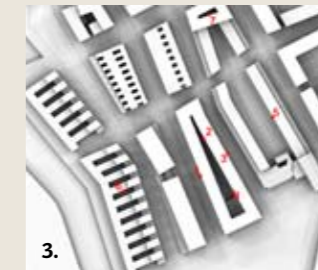
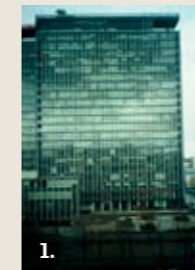
Our genes are a product of the world outside, and only recently have we moved indoors and struggled to engineer an indoor environment, isolated from the continual variance of nature. For most of us, leading indoor lives, the window is the last link with nature. It is not surprising that the window has enjoyed such an elevated position in architecture in the past, but now, in spite of our scientific understanding and our technological opportunity, we seem to be in danger of neglecting its value to human health and well-being. It is ironic too, that in doing so, by designing buildings committed to the use of artificial lighting, we are also contributing to the crisis of global warming.

1. The highly glazed facade of the 1060s – University of Delft, Netherlands
2. The Florescent Dark Ages – the abandonment of daylight in the 1970s. The Kalamazoo Headquarters, UK.

3. A Sky View Factor (SVF) map of a proposed high density housing development in Leicester UK. (The ground level SVFs at points 1–7 were 0.32, 0.11, 0.39, 0.21, 0.42, 0.17, 0.09, indicating varying degrees of over-shadowing. Note, the maximum SVF for a vertical facade is 0.5.)

4. Peckham Library, UK. Even by the window, artificial lighting is kept on for "health and safety reasons"!
5. Libraries at Jesus College (a) and Darwin College (b), Cambridge showing very different daylight environments.

6. The simple window – offering daylight, ventilation and view.



**Table 1:**

Analgesic strength	Number of doses	
	Wall group	Tree group
Strong	2.48	0.96
Moderate	3.65	1.74
Weak	2.57	5.39

Comparison of requested analgesic doses per patient for wall view and tree-view patients; 46 patients between 2 and 5 days after surgery – R S Ulrich

#### Notes

1. In the UK it is estimated that lighting use generates 11% of the CO<sub>2</sub> generated by all buildings and as much as 30% in non-domestic buildings.
2. The Daylight Factor (DF) is the ratio of the illuminance at a point in the building to what it would be outside in the absence of the building. Typical values range from 1–10%.

**Nick Baker** originally studied physics but soon moved into architecture, working in education, research and consultancy. He has published on energy use in buildings, thermal comfort, and daylighting, and is the co-author of *Daylighting Design of Buildings* (James and James, London, 2002). He is currently a tutor and senior researcher associate at the Department of Architecture, University of Cambridge.

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VELUX INSIGHT

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## A DISCREET NEIGHBOUR

Residence in Randalstown

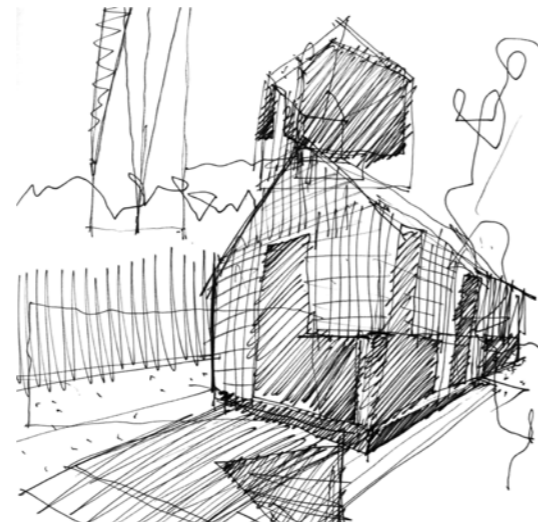
Text by Jakob Schoof  
Photography by Alan Jones

Green grass, black rocks and dramatic blue grey skies have always been the colours of Northern Ireland's landscape, and remain so to this day. Alan Jones' house in Randalstown blends into the scene perfectly. With its warm grey fibre-cement cladding, the building could pass for a barn or community hall. Only in its interior does it reveal itself as a home – in a startling and virtuoso fashion.

"What does it mean, to create an architecture with a particular region in mind; the region in this instance being Ulster? What might follow from this and related questions?"

It seems to us a matter of urgency to consider our architecture in this way, since new political dispensations, to succeed, have to be grounded; there is no grounding more permanent and literal than that achieved by building."

David Brett and Alan Jones in *Toward an Architecture: Ulster*. Black Square Books 2007



**Previous spread** Fog enshrouds the cemetery of the Presbyterian church of Randalstown. Seen from this perspective, the home of the Jones family is perceptible only as a large windowless silhouette.

**Above** One of the first drafts to determine the cubage of the house. The key question for Alan Jones when drawing up the designs for the house was how to make it fit in externally among the surrounding public buildings while still offering privacy to his family inside.

**Right** While the Jones' house appears closed and visually calm on the side facing the street, it opens up on the east side, with four eaves-high bay windows projecting at an angle, looking south to catch the daylight.

When a home is large, it is usually due to the occupants' desire for comfort and grandeur rather than the dictates of urban planning. In other words, houses today tend to look too big for their surroundings rather than too small. This cannot be said of Alan Jones' house in the Northern Irish town of Randalstown, although it covers an area of 20 x 7 metres. It is the sole private house among a group of individual public buildings. The local Presbyterian church, an oval neo-Georgian 18th century building, is built on a neighbouring site. Next to it is the affiliated community hall. A little further away is its Anglican counterpart, Drummaul Parish Church, with its stone spire. The meeting halls of the local Masonic lodge and Orange Order are also lined up along the public road. One could hardly find a less intimate site for a house in this 5,000-strong community, especially as the Jones' garden sits directly beside the Presbyterian cemetery.

In urban planning terms, therefore, the situation existed for a new large volume to be placed on the vacant plot. There was also a need, above and beyond the private sphere, for the building to make the right impression. Accessed along a white limestone gravel drive,

it has two entrances along the same elevation. One, nearest to the road, is immediately visible and semi-public; the other, at the back and out of sight, is private. This rear entrance connects to a wooden terrace on the south, garden side of the house. The building's dimensions give no clue as to the division of its storeys or to their floor plan. Alan Jones describes the view of the house from the street as "mute, dark and visually quiet – with only a single gable window lit at night". The east side, on the other hand, has four eaves-high bay windows, projecting at an angle. These windows look south, away from the street and the church. Alan Jones says that: "It was fortuitous that south was away from the public road, and public north/private south was a theme from the outset".

This opposition is also visible in the house's interior, without it actually being divided into a public north part and a private south part. Rather, there is a combined living room, kitchen, dining and reception room on the ground floor, a space of 20 metres long, divided by glass walls and furnishings and changing in width across bay windows and hallways. This room combines private and public functions within





**Left** As the rooms in the upper storey take up less space than those on the ground floor, Alan Jones dovetailed the two storeys into one another. Everywhere, two-storeyed light shafts bring the light provided by the roof windows down to the ground floor.

**Below** Gold meets gray: rough, waferboard-moulded, exposed concrete walls determine the atmospheric light inside the house. They contrast with the white ceilings and the polished cement floor.

**Right** Mysterious exterior – with its fibre cement cladding, the home appears almost to be a monolith. The size of the building does not hint at the internal floor divisions nor does it permit the floor plans to be deciphered.



its walls. Guests and visitors are received at the street entrance. Beyond this is the dining area, the kitchen and finally the living room, which faces the garden. Each of these sections is lit by its own bay window, while the rooms in the upper storey receive their light entirely from above through roof windows. There are four bedrooms and three bathrooms in the upper storey. This is generous for a family of four, but takes up much less room than the rooms on the ground storey. At the gable ends and entrance elevation, the upper storey rooms are set back from the house's external walls. This allows the living space and the reception area in the ground storey to receive additional light from high windows in the gable facades and through the roof. In a similar way voids over the entrance doors allow skylight into the house and give diagonal views up and down through the spaces. These arrangements cause the first floor rooms to hang above the more public ground floor spaces, in a contained private way with no apparent way of access.

The way the ground storey dovetails with the upper storey is not the only surprising thing about the house's interior. Almost all

the inner walls deviate from the right angle to a greater or lesser degree. The floor plan looks as if it has been gently shaken, to change formal and rectilinear to informal and dynamic. At the same time, the rooms' arrangement is decidedly classical – the living rooms and bedrooms to the east, and to the west a lower, more subdivided section of secondary rooms, housing a staircase, bathrooms, lavatories, cloakrooms and storerooms. The oblique angles, the blunted and sharp corners and two-storey high air-filled spaces give the interior spaces a dynamism and tension that reveals itself gradually. Alan Jones compares the house with the neighbouring church in this respect: "Like the church next door, the interior cannot be read from the exterior and in both there is reward for entering."

The palette of materials in the interior is another part of this reward. Alan Jones chose a massive concrete construction with an insulated facade in fibre-cement as cladding. The formwork for the concrete walls was made from tiles of raw oriented strand board, and they took on the texture of that material: a natural, soft surface that disperses the light, speckled with different colours that came

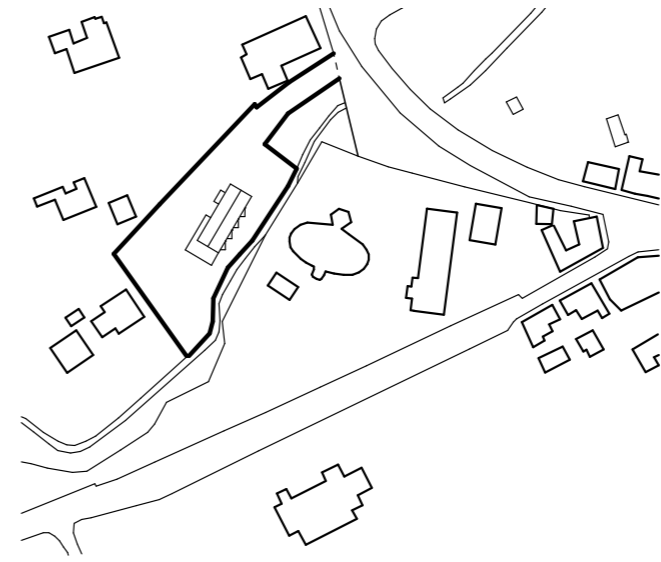
from the formwork boards and numerous light brown wood splinters that were left in the concrete. Together with the polished concrete flooring, the concrete walls produce a peculiar cave-like effect, which matches the building's thermodynamic behaviour. The bare concrete stores warmth very effectively, taking the edge off extremes of temperature both in summer and in winter.

Alan Jones counts the questions that came up during the design process like this: "Can a house take up a prominent position in town, within a row of public buildings, and sit at rest, at peace, in relation to its civic neighbours? Can a new dwelling shed those symbols and visual prompts that say 'house', so it resonates with the surroundings – as if, as some locals say, it looks 'as if it was always meant to be there'?" His Randalstown house is a positive answer to his own questions. In this, he is continuing a long tradition of 'architects' houses' impressive through their quiet greatness, practical qualities and intelligent details rather than an extrovert style.



**Facts**

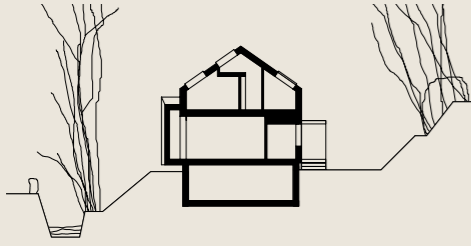
Building type:	Single-family home
Client:	Laura and Alan
Architect:	Jones, Randalstown, United Kingdom Alan Jones, Director of Eductaion (Architecture), Queen's University Belfast, GB
Location:	Randalstown, Antrim, United Kingdom



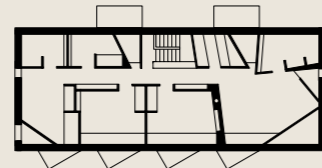
*Left* The only residential building amidst public buildings – the Old Congregation Presbyterian Church, its attendant parish hall and cemetery, the Anglican Drummaul Parish Church and the meeting halls of the local Masonic lodge and the Orange Order surround the Jones' plot of land.

*Below left* Double-height air spaces provide diagonal cross-views through the levels and allow daylight to penetrate down to the kitchen, which is located on the ground floor.

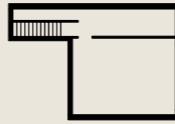
**Cross section**



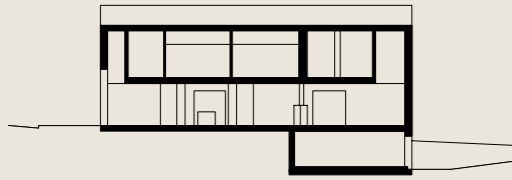
**Upper floor**



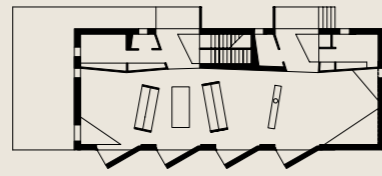
**Basement**



**Longitudinal section**



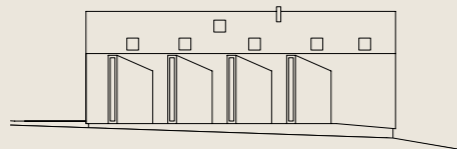
**Ground floor**



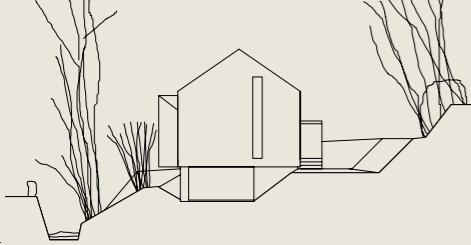
**South view**



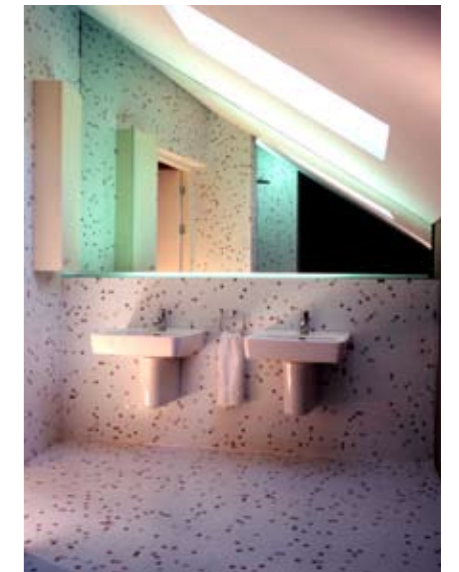
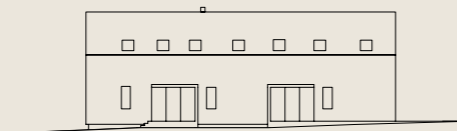
**East view**



**North view**



**West view**



Daylight-filled rooms open up under the black roof cladding. In the bathroom, a cleverly positioned mirror strengthens the impression of open space.

"THIS BUILDING  
MAKES ME  
AN OPTIMIST"

Interview with Wessel de Jonge

PHOTO: SYBOUT VOETEN / MICHEL VERWILT

The Van Nelle Design Factory in Rotterdam, one of the masterpieces of Dutch Modernism, will provide the setting for the VELUX Daylight symposium in May 2009. Daylight&Architecture spoke to Wessel de Jonge, coordinating architect for the factory's restoration, about his work on Modern Movement architecture and the knowledge that the architects of the 1920s and 1930s had about daylight and indoor climate.

**Previous spread** The Van Nelle Ontwerpfabriek is considered an iconic building of Dutch Modernism. The building, designed by Brinkman & Van der Vlugt, was reopened in 2004 after its renovation by Wessel de Jonge Architects and Hubert-Jan Henket.

**Right** In former times, the Van Nelle factory, completed in 1931, was used for the industrial processing of tea and coffee. After its renovation by Wessel de Jonge, the building, listed by the UNESCO as a World Heritage Site, now houses modern offices and businesses.

**D&A:** Mr. de Jonge, in recent years your office has restored buildings by several 'masters' of the Dutch Modern Movement such as Jan Duiker, Brinkman & Van der Vlugt and Gerrit Rietveld. To you, are there any differences in character between the works of these three architects?

**VdJ:** There are great differences between them. Rietveld, for example, stands out because the tools that he used were quite different from those of Duiker and Brinkman & Van der Vlugt. They were those of a cabinet maker and artist, whereas Duiker considered himself more an engineer than an architect.

This difference reflects the search for new strategies among many architects of the era. During the 1920s and 1930s, architecture was struggling to address the issues of industrial society, such as mass migration to cities, the specific problems of working class neighbourhoods, health care, hygiene, and education. As these demands were different from anything experienced before, architecture as a whole was moving in a new direction. As a consequence, the relevance of architecture became less and less of an artistic nature and much more of a scientific or technical one. Many architects started looking for new, industrial construction methods, which, they claimed, would make architecture relevant for the industrial society and its problems.

Like many artists, architects had at first experimented with more artistic solutions, as can be seen in the introduction of simple, pure forms and primary colours by the De

Stijl Movement. Rietveld was very engaged in these kind of things. Duiker and Brinkman & Van der Vlugt, on the other hand, were part of a movement that questioned the very nature of architecture itself. They favoured a more rational, engineering way of looking at problems, analyzing them and subsequently developing solutions from this analysis.

**D&A:** Can you also identify differences in the way these architects worked with daylight, or do the similarities prevail?

**VdJ:** Regarding daylight, I think there are more common features than differences. During the Modern Movement, the transparency of buildings was a sort of cultural paradigm, a general idea which reflected a society that – so the architects thought – was equally transparent in its organization. This idea is reflected in the extensive use of glass in buildings. At Van Nelle, for example, the scheme of the building is totally defined by the use of daylight. The depth of the building was limited to 19 metres, a measure that was based on a simple calculation: Daylight would enter the workspaces from both sides, and even in the middle of the floor, workers should be able to perform their tasks under daylight conditions. So these very rational requirements and calculations led to an extraordinarily long and shallow factory building.

In Zonnestraal, things are more or less similar. The buildings are also very shallow, mostly not more than 7,5 metres. Zonnestraal was also unique in the respect that

the patients were accommodated in small rooms. The normal practice in those days was to have 10 to 12 people together in a larger room. At Zonnestraal, in contrast, the rooms were only three metres deep, which meant that light could get in very well and cover the entire floor area, effectively killing the germs in the room.

Speaking of differences, these are mainly found in the building materials, such as the glass. At Zonnestraal, it was the intention of the architects that you could look out into the landscape from your sick-bed. At Van Nelle, not really, because workers were supposed to work. As a consequence, at the sanatorium, first-quality sheet glass was used, whereas the Van Nelle had a lower glass quality, with more imperfections in the substance, more ripples on the surface and smaller glass panes. The glass used at Van Nelle originally came from the greenhouse industry and was produced in standardized formats only. So in the end, Brinkman & Van der Vlugt even changed the entire proportioning of the facades to accommodate this cheap, mass-produced glass.

**D&A:** Was the use of daylight in the Modern Movement merely confined to providing visual comfort and hygiene, or did the architects also consider its psychological value?

**VdJ:** The psychological value of daylight was of course enormous – as was its metaphorical significance. Duiker often wrote that he was against people's tendency to categorize



PHOTO: FAS KEUZENKAMP

things. Rather, as an engineer, he demanded open-mindedness, the ability to consider each solution for its own merit and then to use the solution that worked best. Daylight was always part of his rational approach. Duiker wanted people to come out of their dark caves and basements, get into the open air, improve their health doing sports and put a much greater emphasis on hygiene than the preceding generations. Interestingly, another 'traditional' constraint that Duiker rejected was the idea of protecting historic monuments. This is in a way ironic because in our days, Duiker's buildings are themselves subject to preservation order.

**D&A:** Herman Hertzberger once noted: "That you can look straight into Dutch livingrooms and can almost take part in what goes on inside is a tradition that never fails to amaze visitors to this country." Was this tradition one of the reasons that the Modern Movement, with its tendency of 'openness' and transparency, was hailed with such great acceptance in the Netherlands?

**VdJ:** This is an interesting question, to which I do not really know the answer. What I can say, though, is that Dutch people, at least in the West of the country, are quite used to the notion of 'engineering' a society. My living room at home, for example, is located 4,5 metres below sea level. If you do not engineer your entire environment under these circumstances, you simply drown. So we are in a way used to modify, engi-

neer and change our environment, and to make it comfortable to ourselves. And this meant that the approach of the architects of the 1920s fitted in very well with the Dutch way of thinking: Analyze your problem, find an engineering solution to it and implement the solution.

**D&A:** What planning tools and evaluation methods for daylighting and ventilation did the architects of the Modern Movement dispose of, and what degree of refinement did these methods have?

**VdJ:** Some architects of the time – but by far not all of them – were pretty well aware of what we would call building physics or building science. As I explained, Duiker considered himself an engineer rather than an architect, and some of his colleagues had the same idea about their profession. One of them was Johannes Bernardus van Loghem, who wrote numerous articles about technical issues such as acoustics, condensation, daylighting, the benefits of passive solar energy and about related calculation methods. In 1932, Van Loghem also published a book about building physics and building technology, which was studied by our team before we started working on the refurbishment of Van Nelle and Zonnestraal. This book, in fact, is very much up to standard compared to what I learnt in university 40 years later. In his preface, Van Loghem gives us an account of why he wrote the book, i.g. his concern that a number of architects who were inclined to follow the

Although the building has a depth of 19 metres, the 60,000 square metres of offices inside the Van Nelle factory receive copious amounts of daylight. The facades have remained as transparent as before; only the electrical lighting has been adapted to the requirements of working at computer screens.



PHOTO: FAS KEUZENKAMP

ideas of the Modern Movement lacked some principle knowledge about building physics. So obviously, in the 1930s as today, not all architects had the same standard of knowledge about building physics.

**D&A:** Seen from a 21st century viewpoint, climatic comfort and overheating seem to have been a severe problem in most Modern Movement buildings. Did people simply have to cope with these issues because the architects did not have the means to control them properly?

**VdJ:** Not at all! They had a clear idea about these issues. But our ideas have changed since then, and if we look at most Modern Movement buildings from our own contemporary perspective, we will conclude that they do not work well. The best example is the Zonnestraal Sanatorium, which does not 'work' at all if it is measured against modern standards because it has all kinds of condensation problems and so forth. One has to take into account how the building was originally used, however: Whereas nowadays we require constant indoor temperatures of 21 degrees, in those days it was 17 or 18 degrees. Moreover, the people who stayed at Zonnestraal had to cure themselves in outdoor conditions. So the doors and windows were always open, even in winter. Under those circumstances, condensation is not even an issue, because it does not occur.

Jan Duiker also designed an open-air school in Amsterdam, with classrooms

whose windows would remain open at all times during lessons. Duiker was of course aware that comfort levels would be a problem in this building. He therefore developed an innovative floor heating system based on radiation, very similar to the concrete core activation systems we use today. Duiker's invention eventually failed, but still it is remarkable that he introduced such a forward-looking system in 1932 already. Like Duiker, many of the architects of his era were very much aware of the obligation to create a comfortable, healthy environment. They were so interested in building physics because they knew they could never design buildings with open plans, large glazed facades, and other features of Modern Movement architecture, if they did not master the technology of climatization.

**D&A:** What challenges have you encountered when you tried to 'upgrade' Modern Movement buildings to contemporary climate and lighting standards? Where did you have to make compromises?

**VdJ:** As the architects of the Modern Movement were so concerned with designing extremely light façade constructions, upgrading these facades becomes an immediate necessity within any refurbishment concept. The façade is also usually the most difficult building component you have to deal with, because it is extremely difficult to technically improve them without completely changing the visual aspect of the building.

In our office, we have therefore developed a more than average knowledge both of facades and of climatization/ventilation systems, because they always go together. The type of glass you use, for example, defines the amount of solar energy that enters the building, and that in turn immediately defines the cooling load of your system. There is always a connection between the two: When dealing with the re-use of an old building, you could of course decide that you do not change the façade at all. But in this case your climatization systems would be enormous, and you might end up with huge ventilation ducts running through your building that would disastrously affect its overall architectural quality. To us, this means that in every project we have to find a balance between inside and outside, doing some improvements in the glazing and the façade, and some in the installations, until the two meet somewhere halfway.

**D&A:** You occasionally mention the 'changing views' about the preservation of Modern Movement buildings among architects. How have these views changed over the last 30–40 years?

**VdJ:** Thirty years ago, most of these buildings were not even recognized as special. In a way, they were simply not old enough. It often takes some time until the historic value of building becomes apparent: Even the Modern Movement architects made numerous changes to their buildings dur-



PHOTO: FAS KEUZENKAMP



At Amsterdam's Schiphol Airport, only the old control tower reminds viewers of the days of early air travel. In 2001, Wessel de Jonge Architects turned the tower into an Industry Club for the managers of the neighbouring business park. The top floor is now used as a Sky Bar.

PHOTO: CAPITAL PHOTOS

ing their lifetime, not paying attention to the value of their own works that they did 30 years before. They also had the idea in mind that their architecture should be functional and directly related to the building's use. Consequently, if the use changed, the building also had to be changed. This was part of their architectural logic. As a result, three decades ago it was quite normal practice to say: "If the original architects had still been alive, they would also have changed this building as well. So why not change it and adapt it to a new use?"

20 years ago this attitude changed somewhat. Some Modern Movement buildings were considered so special, so innovative and so much a kind of prototype that they had to be preserved. But one had to be very selective about them: Most protected buildings still date from the time before 1900, but approximately 80 percent of all existing buildings were built after that date. So once you start protecting 20th-century buildings, you end up with millions of potential 'candidates' and have to make a good and reasonable choice. Zonnestraal, for example, was one of the buildings that were selected for protection around that time.

Still, even 20 years ago, Modern Movement buildings were mostly valued for their spatial concepts, not so much for their materials. Contrary to older, hand-made structures, the industrial materials of the 1920s and 1930s were simply considered 'replaceable' by contemporary building elements, even if this changed the look of a

building considerably. Only during the last 10 years have we learnt that the material aspect of Modern Movement buildings may just be as important as their spatial concept. Because it is often the materials that make you realize the true age of a building. When people who are not architects see the Van Nelle factory, for instance, from a certain distance and I ask them "How old is that building?" they all say "maybe from 1960 or 1965". Only as you get closer or even walk inside the building, it becomes apparent in all kinds of details that the building is actually from the late 1920s.

So in the third phase of the development, we are observing the use of original materials, surfaces, textures and colours – including glass – becoming ever more important. When we started working at Zonnestraal long ago, I was the first one in the team who was convinced that drawn glass should be used for the building, rather than float glass. After all, Zonnestraal is barely more than glass – and if the glass is not right, what do you have left?

Even the heritage authorities did not fully appreciate the impact of such a choice at that time. But I had discovered that in drawn glass, because it is irregular, the reflections and the vision through the glass are slightly distorted. The material thus underlines the fragility of the building. Moreover, if you look at the building from outside and imagine the facades made of float glass, you would see a perfect reflection of what is behind you. This reflection distracts your attention, the

glass is less transparent in a way, and you no longer feel invited to look through it.

**D&A:** Originally, Zonnestraal was only conceived for a lifespan of only 30–40 years. Aren't you, when you try and preserve this building today, really acting against the intention of the architect – and what approach does this fact call for?

**VdJ:** With our partner architect Hubert-Jan Henket and Partners, who is actually supervising the entire redevelopment of the Zonnestraal complex, there has been lengthy and principle debates about this. Yes, we are acting against his point of view, but eventually we did not think there is any problem with that. First of all, people like Jan Duiker had the idea that at one point in time the whole world would look like their buildings. They were designing prototypes for the future. But these prototypes were never really followed: first came the economic crisis in the 1930s, then World War II, and after this, ideas changed and the influence from the USA gained ground in the building industry. Thus the buildings that Duiker and his contemporaries built in the 1920s and 1930s are pretty rare today, which is one of the reasons why they should be protected.

Moreover, the quality of a work of art can grow bigger than the interest of the artist himself. Franz Kafka, for example, wanted all his manuscripts to be burned after he died. But people didn't burn them. The work of Kafka was simply more important than his



PHOTO: SYBOLT VOETEN/MICHELKIEVITS

The Sanatorium Zonnestraal by Jan Duiker was originally designed to have a lifespan of only 30 years. This made its renovation at the beginning of the 21st century even more difficult. Drawn glass was used, which exhibits the same slight unevenness as the original.

own idea. The same applies to a building like Zonnestraal: What Duiker thought is maybe not so important. We are making the decision to preserve it, and therefore our philosophy applies to the building and not his.

**D&A:** You once wrote: "The pioneers of the Modern Movement considered a building's right to exist not to be determined by its history, but by its usefulness." Does this imply an imperative for today's investors and architects to look for suitable re-uses of these buildings?

**VdJ:** It is true that the pioneers of the modern Movement had these ideas. But it was also part of their polemic. They propagated an entirely new philosophy about architecture, which is why their points of view and the way they expressed them were maybe more radical than reality. On the other hand, it is true that they considered the beauty of a building to be rooted in its functionality. In our work, we therefore always try to match new uses to the original intention of the building. This is interesting, because in the 1920s and 1930s the slogan was 'form follows function'. Architects had a functional programme and then created a building according to it. The job we do with these buildings is exactly reverse: In order to maintain the physical appearance of Modern Movement building, we have to find a function that fits them. It is, in other words, 'function follows form'.

Often, when property developers acquire a Modern Movement building, they are not

exactly sure about its potential for new uses, and it then becomes our task to analyze the building. Currently we are working on projects where we select functional programmes from four or five different options. Generally, sticking closely to the original use of the building enables you to respect the existing structures, which is helpful from a conservation point of view. But it also cheaper in most cases to make use of what the building offers rather than to act against it.

**D&A:** Today you have your office in the Van Nelle Design Factory. How would you describe the spirit of the building – knowing it so well? Do you still 'feel' the old factory?

**VdJ:** Oh yes, everyone feels it, even people who visit us for the first time. Once you enter our office, you can look outside, you get a feeling of the weather, you can see the sky, which changes all the time. The building makes me an optimist, because it is so uplifting. It creates a good spirit and makes you open-minded, it is inspiring and dynamic, and provides a perfect working environment. Most of the people who work here feel the same – and if they don't, then they should not work here! As I said: function follows form, you have to adapt to this building, which also has certain disadvantages. For example, the acoustics is difficult, and sometimes there is too much daylight for computer work.

But the building is also very generous, and you get a lot in return: the atmosphere, the beautiful spaces, the high ceilings, the

daylight ... Also at Zonnestraal, in a different way, it is more or less the same. People get excited; they feel the particularity of the place. The interrelation between architecture and nature at Zonnestraal is simply amazing!

**Wessel de Jonge** (1957) graduated in architecture at Delft University of Technology, The Netherlands, in 1985. He has been the co-founder of DOCOMOMO International and served as the Organization's International Secretary and the editor of the DOCOMOMO International Journal from 1990–2002. As a practicing architect, he has been in charge of the restoration of Gerrit Rietveld's 1953 Biennial Pavilion in Venice (Italy), the restoration of the former sanatorium 'Zonnestraal' in Hilversum (Netherlands; in co-operation with Henket Architects) and of the large-scale rehabilitation project for the Van Nelle Design Factory in Rotterdam.

## A WINDOW ON THE GARDEN

**Right Generous in space and daylight, the walls and ceiling of the almost seven metre high top floor are entirely white. Two rows of roof windows bring light down into the extraordinarily deep room.**

The little town of Le Landeron lies at the foot of the Swiss Jura on the south side, between Lac de Biènné and Lac de Neuchâtel. In the middle of the 14th century, the count of Neuchâtel founded a fortified town in the alluvial plains of the Thielle river, which was granted a town charter shortly afterwards. The old town still retains its medieval structure today. An exceptionally wide tree-lined main street runs through the centre of town from east to west. It is flanked by tall narrow residential houses with stucco façades. The roofs overhang, sometimes considerably.

House no. 27 is on the east side of the main street. The façade facing onto the street is listed, like that of all the houses in the town centre. Only its fresh white paint reveals that the house has undergone alterations in recent times. Everything is different on the east façade, which faces towards where the old town ends abruptly and gives way to a broad stretch of gardens and meadows with fruit trees. The building has a large panoramic window facing onto this landscape, making the greatest possible contrast with the surrounding old buildings.

The conversion carried out by the architects frundgallina only involved the house's second storey and attic, not the apartments in the lower storeys. A survey revealed that the roof truss needed to be replaced, while the wooden beam ceiling between the upper apartment storey and the attic was retained. The architects created two sequences of rooms that could not have been more different from each other – the sec-

ond storey was given a rather heavily subdivided ground plan with three bedrooms and a bath, while an open room for living, cooking and eating was set up in the attic. This room is as high as the roof ridge, and it has an open gallery. There are similarities, however. Both levels have dark wooden floorboards and rough white walls that reflect daylight deep into the interior spaces. Both storeys' ground plans were made independent of the external walls' rectangular plan. The corridor in the second storey runs diagonally through the house. If the doors are closed, one sees a clear passage leading directly to the stairs to the attic. If one opens the full-height doors, on the other hand, the boundaries vanish, and one can see straight from façade to façade. As the light partition walls and fitted cupboards have the same white surface as the load-bearing external walls, the overall effect is that of a homogenous, angular spatial shell directing both movement and line of sight.

The picture in the attic is similar: stairs, WC and storeroom are arranged along the longitudinal walls shared with the neighbouring houses. The exposed faces of the furniture and the partition walls distract the eye from these, narrowing the room inwards to focus on its central space, where an kitchen block made of smoked oak forms the central axis and pivotal element for this level. The room's only non uniform feature is the different windows. At the west end, only a small window opens onto the street – originally a hatchway for the attic, now closed by a glass pane – but when the house's occupants sit

down to dine at the east end, they can enjoy a view through the panoramic window. Two rows of three roof windows help significantly in lighting the space, which is almost seven metres high. In the east façade they are set high up under the roof ridge and mainly supply the gallery with light, whereas on the west side they are much lower down, directly above a residential area which would otherwise have few windows.

The architects describe their intervention in the centuries-old townhouse as "sensitive but enthusiastic." The conversion is a sign of architectural change in a town that has made a name for itself as the "City of Antiquities" and annually hosts the largest bric-a-brac market in Switzerland. In their 'clearing out' of the old building, frundgallina must have realised that they did not have to provide for any load-bearing walls. They took full advantage of the freedom this gave them, infusing the venerable building with an avant-garde inner life of undoubted quality. That this involved part of the building's outer shell being demolished on the garden side shows how space and light requirements have changed over the centuries. It also shows the limitations in meeting these requirements. A panorama window like House 27's merely adds a pleasing modern touch to its historical surroundings, but if the neighbouring houses had windows of this size it would give the area a totally different appearance.

PHOTO: THOMAS JANITSCHER



Seen from the garden, No. 27 looks like a new building. But only the top two floors were altered; the lower floors were left untouched and the side facing the street was barely changed.





The gallery under the roof ridge offers space for undisturbed work. But it also offers views of the garden – and of the sky over Le Landeron.

PHOTO: THOMAS JANTSCHER



In the east, the old town ends abruptly and gives way to a landscape of meadows and orchards. The panoramic window, one storey high and as wide as the building, brings nature inside.

PHOTO: THOMAS JANTSCHER

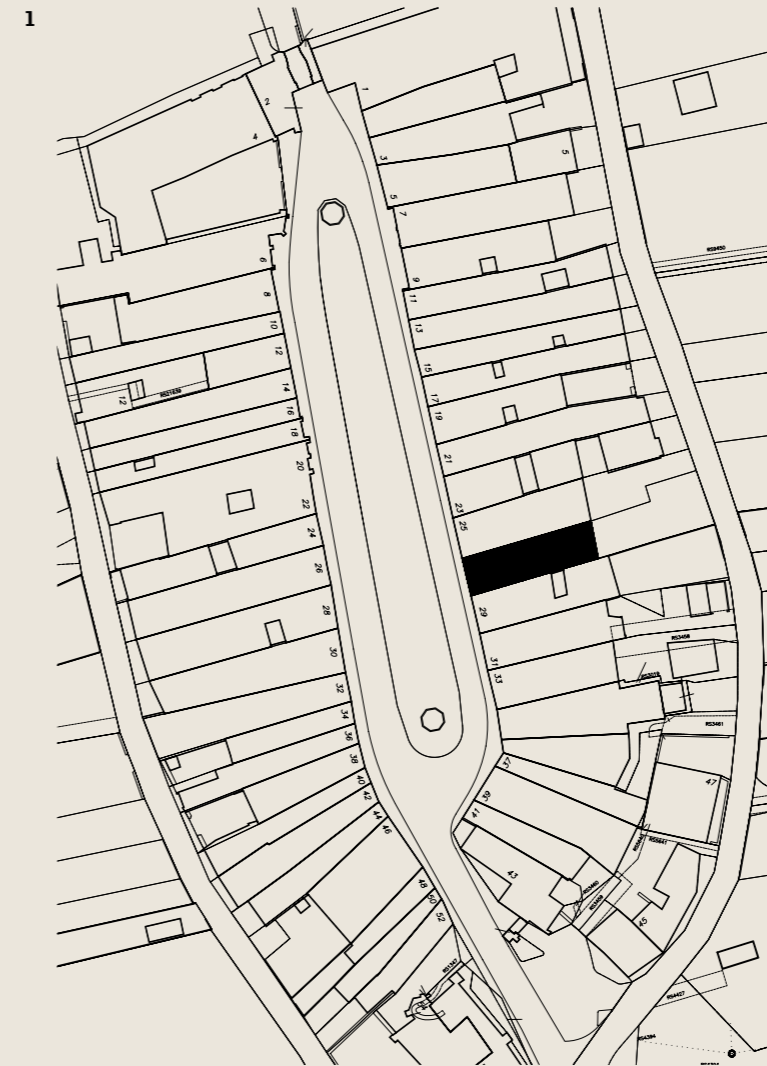
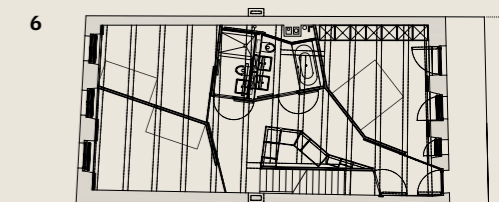
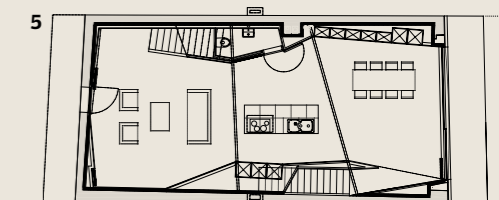
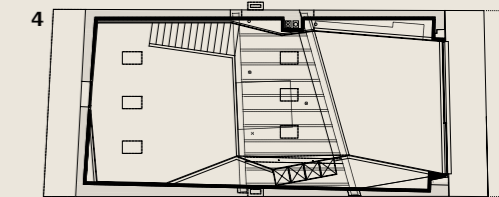


PHOTO: THOMAS JANTSCHER



PHOTO: FRUNDGALLINA

<b>Facts</b>	
<b>Building type</b>	Conversion of a residential house
<b>Client</b>	Private
<b>Architects</b>	Frundgallina SA, Neuchâtel, CH
<b>Site</b>	Ville 27, Le Landeron, CH



1. Floor plan
2. The storage and ancillary rooms together with the staircase to the second floor were sited along the longitudinal partition walls shared with the neighbouring houses. This made it possible to retain the width of the living space.
3. The side facing the street (seen here prior to the renovation) was merely repainted and the hatchway of the former attic (at the top) was replaced by a window.
4. Floor plan of the top floor
5. Floor plan of the second floor
6. Floor plan of the gallery floor



# BOOKS

## REVIEWS

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

### THE PITCHED ROOF

Editors: Barbara Burren, Martin Tschanz, Christa Vogt  
Niggli Verlag  
ISBN 978-3-7212-0680-7

Digital media, globalisation, ecology and new materials – this quartet of themes (along with the accompanying theory) has dominated architectural publications in recent years. However, a reverse trend has recently become noticeable. Publishers and authors (particularly university lecturers) are becoming more concerned with passing on a knowledge of the basics. Their reasoning is that today's students are once more in need of concrete design and construction help. For this reason, we are seeing ever more handbooks on presentation techniques, design strategies and common construction-related questions on the shelves of bookshops.

Although it is not a construction or design handbook, the new book from the Zürcher Hochschule für Angewandte Wissenschaften (ZHAW) Winterthur also falls into the "basic

knowledge" category. It concerns the historical origins and design possibilities of one of the most versatile construction elements in architecture – the pitched roof. As little as 15 years ago, the choice of subject would have been understood as a political statement. Inclined roofs were considered conservative at best and at worst backward. To be considered a progressive architect, one had to be a master of the flat roof, an element that symbolised modernity.

Today, the entrenched ideological positions have been abandoned. The avant-garde have discovered the pitched roof, freeing it from its nostalgia stereotype. In building such as the Yokohama Ferry Terminal by Foreign Office Architects or the Casa da Música in Porto, both flat and pitched roofs appear in a new synergy, sweeping away the negative historical connotations. Even in residential architecture, there have been significant changes. Hochschule Winterthur's book presents a sequence of historical and up-to-the-moment examples side by side, sorted by design rather than by date. In the foreword, the editors write that they had no intention of taking a didactic approach, or even of making the book readily understandable. Rather, the book is in the tradition of Corbusier's *Vers une Architecture* and Rudolfsky's *Architecture without Architects*. Subjective, collage-like pages of illustrations are accompanied by short text that make lateral connections between the buildings depicted. The chapters, with headings like "Roof and context", "Roof as symbol" and "Roof and light", each begin with pictures and end

with a short essay. The variety in the essays testifies to the many facets of the subject. The authors examine modern architecture's 'roof war' between the champions of flat roofs and pitched roofs respectively, the tradition of the 'tent spaces' in historical palaces and residential houses, the symbolic value of open wooden roof trusses and roof constructions by the Swedish architect Klas Anselm. Most of this is instructive, if sometimes rather divorced from everyday practicalities. The Pitched Roof's large number of illustrations, however, provide a wealth of inspiration for design work – far more so, in fact, than the presently common affordable large-format "architecture picture books", which often lack focus.

### OVER

Editor: Alex MacLean  
Schirmer/Mosel Verlag, Munich  
ISBN 978-3-8296-0383-6

For centuries, human beings have been shaping the world according to their will. The possibilities are seemingly limitless. Whole cities like giant oases with manicured golf courses and suburbs adorned with palm trees are built in the desert, kept artificially alive with water despite its scarcity. Huge holiday fortresses offering a little paradise for luxury-craving travellers rise from coasts threatened by erosion and hurricanes. Artificial housing developments are conjured up out of thin air. Characterised by cul-de-sacs and uniform house-plus-garden monocultures, they create an-

onymity and make cars essential to life and survival. Huge coal-fired and nuclear power stations produce vast amounts of electricity used almost as quickly as it is produced. Land speculators carve whole road networks into the landscape that stand out like warning scars on the earth.

By recording these scenarios with the camera, the photographer and pilot Alex MacLean holds a mirror to humanity. For his book *Over*, he criss-crossed the USA in a plane, photographing suburbs, industrial facilities, power plants and sewage treatment plants, as well as gigantic wind farms and solar parks. Precisely because they are taken from a distance and at an unusual angle, these pictures open our eyes anew to our lifestyle – to its hope and hubris, its comfort and greed, its intoxicating possibilities and the impermanence of our existence. They also bring us into close contact with climate change, excessive forest clearance and urban sprawl, and many other things we consider lamentable but strangely distant from our everyday life. MacLean's photographs document not only America's ambition and excesses, but also that of other continents. After all, the American model has been enthusiastically adopted in Asia.

However, it is not only MacLean's photographs, but also his detailed commentaries and short essays on themes such as dependence on the car, threatened deserts and the wastage of water that provoke thought. In the words of the science journalist Bill McKibben, they make the book an "exceptionally valuable document, because they name precisely those

forces that are about to destroy our planet." One should therefore be careful in reading *Over* simply as a documentation of the American Way of Life. In his book, Alex MacLean shows us his home nation, apparently innocently – but on a deeper level he means all of us worldwide.

### LIVING IN DAYLIGHT

Author: Maria-Therese Hoppe  
Gyldendal  
ISBN 978-87-02-07610-3

There are inventions that change the world. This one at the very least changed the roofs of Europe: in 1941, Danish engineer Villum Kann Rasmussen developed the first roof window that could compete with facade windows in terms of protection from the wind and rain for an architect friend. In order to market it, he established a company and called it after the most important qualities that his invention aimed to bring to the house: VE for ventilation and LUX for light. In the period of reconstruction after the Second World War, VELUX roof windows became landmarks in the architecture of European cities – both in the city centres and new-build areas. Rasmussen recognised how he should market his windows early on: he targeted home owners' desire for more living space and light rather than focusing on his own product.

On the occasion of the founder's 100th birthday VELUX, together with Danish author Maria-Therese Hoppe, published a book that is com-

pletely in the spirit of this philosophy. *Living in Daylight* presents over 50 reference projects with VELUX roof windows – but does not focus on the technical or design aspects of each building. The stories that the residents have to tell were important to the publishers and author. Many of these characters are just as unique as their homes: the water colour artist in her workshop above the roofs of Paris, the German doctor who emigrated to the Norwegian wilderness, or the young Estonian foreign minister who reveals himself in the book as a family man and nature-lover.

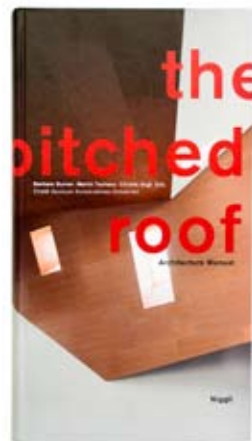
However *Living in Daylight* also documents the fact that roof windows have now also become part of our cultural history. There is hardly any location where they cannot be found – this applies equally to the Palais de Justice in the heart of Paris, the Portuguese parliament building and Copenhagen's hippie town Christiania. You can find roof windows in new builds in Turkey, renovated city homes in Bucharest and converted barns in the British countryside. Maria-Therese Hoppe visited all of these places and records how people live and work in their rooms and what the daylight and room through the roof windows means to them. The top quality photos throughout show the buildings and residents in a sensitive manner, often from an unfamiliar perspective but without any tendency to over-stage them as is occasionally the case in architectural publications. The book is rounded off by a brief historical overview, not only of VELUX and the history of the roof window but also of how our perceptions of home have changed over time.

### BEACHLIFE

Publisher: Frame Publishers  
Die Gestalten Verlag  
ISBN 978-3-89955-302-4

The world's beaches and coastlines have always provoked man's creativity and the urge to tinker – anybody who once built a sandcastle can testify to this. However, it is exactly on the banks and shores of the rivers and oceans where conflicting interests also collide; rejuvenation versus transport development, climate and marine conservation versus return on investment, as several of the most important conflicts are known. Nowhere is the horizon so far reaching as at sea, nowhere better does the soul find peace – and nowhere can more profit be extracted from a square metre of earth than there, where land and sea meet. The book *Beachlife* highlights more than 115 buildings and projects, works of art and design objects planned over the last five years for sites in or on the water. This mere tome, compressed on 280 pages, proves the diverse demands on today's 'beachlife': floating megaprojects on the coasts of Dubai and Abu Dhabi tower alongside the work of small architects like Nils Holger Moormann's *Walden*, land art in the tradition of Dani Karavan beside artistic interventions emphasising climate change and the problems of refugees. The publishers have divided their book into five chapters: leisure, hospitality, art, residential and products. However, this is only a kind of minimum consensus, and one wonders whether being arranged ac-

ording to building size and typology would have made more sense in this case. As a result, the sequence occasionally seems a little haphazard, and the only alternative is to claw one's way forward from project to project through the book. However, despite occasional inconsistencies in the quality of design, this is not difficult as the book's layout is appealing, the text concise and written with spirit. As conclusion, two findings can be drawn from the book. Firstly - very few designers in fact used the element water for their work; the majority were satisfied with one more or less clear 'sea view'. Secondly - at best it would appear that the visual artists successfully lend today's ambivalent beaches an expressive face; far from expressive needs and the obligations of functionality they were able to deal with subjects such as the throwaway society, global warming or terrorism worldwide. An installation like Gregor Schneider's 21 Beach Cells, where the German artist erected 21 Guantanamo-like wire mesh cells on Bondi Beach in Sydney, depicts the downside of global beach tourism and its security demands. It also clearly illustrates that there is a 'beachlife' beyond the one shown here – even if this has not been a subject for architects and designers up to now.



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VELUX Editorial team  
Per Arnold Andersen  
Christine Bjørnager  
Lone Feifer  
Lotte Kragelund  
Torben Thyregod

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

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Jakob Schoof  
Britta Rohlfing

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Translation  
Sprachendienst Dr. Herrlinger  
Michael Robinson  
Dr. Jeremy Gaines

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Re-write  
Tony Wedgwood

Photo editors  
Torben Eskerod  
Adam Mørk

Art direction & design  
Stockholm Design Lab ®  
Per Carlsson  
Nina Granath  
Björn Kusoffsky  
[www.stockholmdesignlab.se](http://www.stockholmdesignlab.se)

Cover photography  
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[www.michaelreisch.com](http://www.michaelreisch.com)  
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Germany  
[www.rolf-hengesbach.com](http://www.rolf-hengesbach.com)

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Li River Study 8 – China  
[www.josefhoflehner.com](http://www.josefhoflehner.com)

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Ontario, Canada

