Kim Dirckinck-Holmfeld is an architect and one of the most renowned architecture critics in Denmark. He was editor of the Danish specialist magazines Arkitekten and Arkitektur DK for many years, and is the author of numerous books about architecture.

**FORM AND IMPRESSION**

At the VELUX Daylight Symposium in Bilbao in the spring of 2007, the insight into how America treats its children gave particular cause for reflection. In California, pupils are forced into derelict, shabby, unattractive rooms with no daylight. You don't need to be a professor of psychology to realise that depressing environments of this kind, with a complete absence of experience, lead to problems with unhappy and maladjusted children. The atmosphere is evidence of a lack of welfare provision that appears to be contagious. It is not surprising that the performance and happiness of the children improves by up to 25% when daylight is let into the rooms (as architect and researcher Lisa Heschong discovered) – and, importantly, through windows that the children are able to see out of. Lisa Heschong’s research has produced clear evidence that daylight and a view are imperative for physical and mental health.

But what about all the other factors that contribute to a complete spatial experience?

How does our environment affect us? The town, the building, the room, the landscape – even the last is designed by humans. When it comes down to it, our entire environment is the work of humans. But is it also humane?

Space plus form equals impressions. But how are they created? We know very little about this, and science can help us little in understanding more about it. There are too many factors that work together here. We need to develop different methods to ensure that architects and builders build for people instead of jumping on the next mega-trend in the international flying circus of architecture.

There is not enough research that is able to qualitatively analyse building environments and consequently provide support for planners and constructors. There are various approaches to this, but there is no real research carried out about the mental and emotional effects of architecture. At least we do know something about human behaviour in different types of urban space and under different climatic and cultural conditions. Among others, architect Jan Gehl and a network of urban researchers addressed this subject, and for a generation, it has been one of the basic principles for avoiding social planning errors.

Even if, in building projects, many other objectives often elbow this information out, there are also already certain guidelines for humane urban development based on a behaviouristic approach. But we still know little about what exactly goes on inside people.

In many ways, architecture has become removed from its origins, in other words, the intention of creating a stimulating framework for human life. Moving in time with technological development (and assisted by helpful computers) we are faced increasingly with newer, more fantastic and seductive designs, that sprinkle a builder’s glittering magic dust over projects. But what is it really like living and being in these phantasms that express more what we can do that what we actually want?

The architect’s responsibility is still to create a humane, healthy, sustainable and life-affirming space for the lives that flow through the channels of architecture.
“Light is a drug that stimulates the production of serotonin, dopamine and gamma-aminobutyric acids in the human body, enhancing impulse control, motivation and the ability to concentrate. Light and an outdoor view stimulate the learning abilities of school pupils in the classroom.”

Many people do everything they can to avoid exposure to the sun; the fear of sunstroke and the unhealthy effects of UV light are simply too deeply engrained. Even yet, in times of global warming, sunlight is one of the best things that nature has to offer to the human body.

Richard Hobday explains why, and what consequences this could have for architecture.

**Juan Nouvel’s planned new Louvre building in Abu Dhabi stands out due to its light-filled cupola as well as his masterful renderings. Video stills adorn the colourful facade of the Netherlands Institute for Sound and Vision in Hilversum, greetings to the building past, the plastic-Film cupola in the Atrium of the Dutch Institute.**

The Sanatorium in Hilversum is the perfect embodiment of the ideals associated with architectural modernism in respect of light, hygiene and health. The building designed by Jan Dixler, Bernard Bijvoet and Gerko Wiebenga was the expression of a medical and architectural attitude which still looks the sun seriously as a healing source of life.

Add your read.

**With their primary school in Kingsmead, a town in the north of England, White Design created an outstanding example of how to build a sustainable construction as a learning environment. With its very dynamic roof construction, the wood building is not only based on modern technologies which save energy and raw materials but also allows the schoolchildren to experience these features. Daylight plays an important role in this, ensuring a pleasant learning climate and enabling the school to make substantial energy savings.**

**Architects and light planners have rediscovered their appreciation of daylight. But the complexity of the matter still makes many of them wary of dealing with the issue intensively and in depth. During the second VELUX Daylight Symposium in Bilbao, projects were presented as examples and new solutions aimed at facilitating daylight planning were discussed.**

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**The importance of daylight to architecture and people’s quality of life is a keynote in the founding of our company. Bringing light to life is our philosophy in everything we do linking natural resources with human needs. Through research and practice we are constantly looking into how daylight can contribute to and enhance human health, learning and productivity. With this issue of Daylight and Architecture we focus on how outdoor and indoor climates, views and most notably daylight can substantially affect our lives. Through the channels of daylight, enjoy your read.”
The things that make architecture tick: events, competitions and selected new developments from the world of daylighting.

If one is to believe Sheikh Khalifa bin Zayed Al Nahyan, ruler of Abu Dhabi, the largest of the seven United Arab Emirates is set to become one of the world’s foremost cultural metropolises over the next ten years. In early 2007, the desert state presented plans for four prestigious cultural projects to the public: an offshoot of the Guggenheim Museum, the Saadiyat Performing Arts Centre, a maritime museum and a museum of classical art. All four establishments are to be based on the 27 square kilometre Saadiyat Island, in English: the Island of Happiness. The list of the architects leading the projects reads like a Who’s Who of world architecture: the Guggenheim Abu Dhabi is the responsibility of Frank Gehry; the Performing Arts Centre is being planned by Zaha Hadid; and the Maritime Museum bears the hallmarks of Tadao Ando’s work. For the Museum of Classical Art, the Emirate has engaged Paris-based architect Jean Nouvel – and one other high-profile partner from France: Abu Dhabi has paid around EUR 700 million for the privilege of giving the completed new building the name Louvre Abu Dhabi. Moreover, France has pledged to supply this desert outpost with works of art from the Louvre Paris for its first ten years of existence.

Jean Nouvel’s design is a study of the museum’s location, between desert and sea: just beyond the previous coastline, a complex of small buildings – museum pavilions, open terraces and water basins – starts to emerge. This complex will be crowned by a broad, flat dome with a diameter of some 180 metres which, according to Jean Nouvel, represents a link between the world cultures. The dome “is made up of a web of different patterns interlaced into a translucent ceiling which lets a diffuse, magical light come through in the best tradition of great Arabian architecture”. The presence of water and the constant sea breeze should make for a pleasant climate underneath the dome.

Henri Matisse meets Nam June Paik – these or similar associations are those evoked by a first look at the Netherlands Institute for Sound and Vision in Hilversum. And the thought of Korean video artist Paik, at least, sums things up very accurately: the Dutch artist Jaap Drupsteen used 748 film stills from the institute’s archive of all the audio and visual materials it receives from Dutch radio and television history. In its seven upper floors the building, which was designed by Neutelings Riedijk Architects, offers room for offices, a museum and a multimedia library. The above-ground and underground sections of the building are connected via a cruciform plenum: looking north-south, the eyes drift upwards the atrium; looking east-west, a chasm-like light well falls away right down to the fourth underground level. The facade and front entrance of the building face south, allowing the afternoon light to penetrate and illuminate the foyer in an almost magical way. The Institute’s facades are a joint project of Neutelings Riedijk, Jaap Drupsteen and glass-maker Saint-Gobain, who commissioned a new production line especially for the manufacture of the required panes of glass – more than 2,100 in all. The film stills were transferred onto the panes using a recently developed digital printing process with ceramic inks. In a second step, the blank side of the glass panes was engraved with a relief of the same image, so that all 748 images can be seen on both sides of the glass – sometimes in two dimensions, sometimes in three. The reliefs were first moulded as negative moulds made of MDF, then given a ceramic coating before finally serving as moulds for the viscous glass at temperatures of 820 degrees.
On 1 October, the third International VELUX Award for students of architecture, Light of Tomorrow, opens. The Award event runs every second year, with the first being held in 2004. It is targeted at students and teachers at schools of architecture all over the world. The Award is intended to encourage and challenge students of architecture to explore the theme of sunlight and daylight in its widest sense in order to create a deeper understanding of this source of light and energy. The Award seeks to explore the boundaries of day-light in architecture, including aesthetics, functionality, sustainability, and the interaction between buildings and environment. The Award is not restricted to the use of VELUX products.

The concept of the Award is that teachers nominate student projects completed during the academic years 2006/07 and 2007/08. An internationally acclaimed jury will evaluate all the submitted projects on the criteria of conceptual idea, experimental thinking and critical discussion and will award a total sum of €30,000 to the winning students and teachers. The jury consists of acclaimed professionals including practicing architects and representatives from IVA and EAIE and the students must submit their projects before 8 May 2008. All submitted projects will be exhibited at the XXII UIA World Congress of Architecture in Turin in summer 2008.

The jury members in 2004 were Glenn Murcutt, Craig Dykers, John Pawson, Ole Bouman, Almeid Siddiqk, James Hiram and Michael Pack. In 2006, Kengo Kuma, Rikian Honghan, Omar Rabb, Douglas Shook, Per Olaf Fjeld and Massimo Buccini. The jury members for the 2008 Award are currently being appointed. Jury evaluation will take place in June 2008, and VELUX will announce and celebrate the winners at an award event in November 2008 to which the winning students will, of course, be invited. Previous Award events were held in Paris and Bilbao where the winning students and their teachers had the opportunity to meet the jury members and other representatives from the international community of architects and building professionals. Roadmire at www.velux.com/IVA.

In Italy’s automobile capital Turin, there is much at the start of the new millennium that heralds the end of one era and the beginning of a new one. One of the epicentres of renovation in the city is located in its north-west corner. Once dominated by the furnaces and mills of heavy industry, in the years to come the area is earmarked for the development of housing for 15,000 people. For Turin Cardinal Severino Poletto, this was reason enough to give the new quarter a religious hub as well. With Mario Botta, he commissioned one of the most prominent church architects of our time to design a new church building, conference hall and community centre with a 700 person capacity for the quarter.

Santo Vito church stands on the site of what was once a machine shop belonging to the Fiat Group. Its 60-metre high chimneys is now a church tower and provides a distinctive landmark for the new church which can be seen for miles around. Around the outside of the tower winds a helix made of high grade steel with horizontal ‘towers’ designed to be reminiscent of Christ’s crown. A metal cross at the top provides the finishing touch.

On 11 March 2004, exactly two and a half years after the attacks on the World Trade Center in New York, ten bombs went off during morning rush hour at Madrid’s Atocha station. 231 people were killed and 1,800 injured in the days that followed. Thousands of Madrid’s residents and tourists left messages of condolence at the site of the bombings and on the Internet. A selection of these now adorn the interior domes of the monument erected for the victims, which was unveiled on the third anniversary of the attacks: one example reads “Hace falta mucha fantasia para soportar la realidad (A great deal of imagination is needed in order to bear reality)”.

And the five young architects from the Estudio PAM 2003 practice certainly proved their capacity for imagination when they won the competition to build the Memorial. Their renderings showed an iridescently curved glass dome in whose interior the inscriptions seemed, in some mysterious way, to be floating.

In its execution, the dome may have lost its apparent weightlessness – and this despite weighing approximately 200 tonnes. Its outer shell, an 11-metre high glass cylinder, was constructed from 15,000 indi- vidual bricks, each measuring 100 x 200 centimetres and made of solid, colourless glass. The bricks are self-supporting and were joined together using acrylic adhesive. Inside the glass cylinder hangs a bell-shaped interior dome made of ETFE foil, upon which the messages received from all over the world in the wake of the bombings have been imprinted. The translucent foil allows sunlight to stream into the building and, in a sense, ‘suck’ the foil upwards.

The memorial can be visited via the Atocha underground station from here, the visitor can gain access to an austere blue space extending over almost 500 square metres, the ‘vació azul’ (blue void), as it is called by the architects. Estudio PAM associates a certain claim to eternity with its structure: the intention is for future generations to be able to read the messages of the mourners today. Whether the unusual structure, which has never yet been tested on such a scale, will be able to deliver on this score remains to be seen.

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Continuing until 6 January 2008, the Kunsthalle of Düsseldorf is currently showing an retrospective of the work of Japanese photographer Hiroshi Sugimoto. Born in 1948, the artist, who has been living in the USA since 1970, is one of the most important photographic artists alive today. In his great, incredibly detailed large-format photos – mostly rendered in black and white – Sugimoto deals with subjects such as time and memory, reality and representation. Using extremely long exposure times, muscular use of light and selective soft focus, he is able to portray reality in a way never before performed to the human eye. Sugimoto’s rise to fame started in the mid-1970s with his Theaters series, long-exposure images of movie theatres and drive-ins. The exposure of the film in the cam- era lasted as long as the film on the screen, thus allowing a single photo- graph to show the sum of all the de- tails of the film – how could it be otherwise – blend together to form a dazzling white screen. In the Architecture series (1997 onwards) Sugimoto creates alien- ated images of much photographed icons of modern architecture by a targeted use of soft focus. Although the images are stripped of all de- tail, the buildings remain recognis- able, but other aspects come to the fore: reflections of the sunlight, the texture of a shadowy sky, or dramatic contrasts of light and shade on the buildings’ surfaces.

In his latest series, Sugimoto re- mains a devotee of representational photography, however, his subjects are becoming even more reducti- ve. In Colors of Shadow, a series of colour photographs of an unfur- nished Tokyo apartment, Sugimoto explores the interplay of light and dark, surface and space created by the daylight falling on the abstract concrete walls. The Conceptual Forms series show plaster rep- resentations of mathematical models from the Tokyo University collection, which Sugimoto Evelyn to the status of abstract sculptures through effect- ive use of lighting. The Düsseldorf exhibition is the first stop on a tour which will take in three further stages. It comprises nine series of works as well as the centre of the exhibition, Sugimoto’s aluminium sculptures, Ordinated.
Kept to within reasonable limits, direct sunlight is the best thing that nature can do for our health. Some of its effects have been known for thousands of years. This makes it all the more astonishing that physicians and architects have long reacted to this knowledge with ignorance or rejection. And, all too often, this reaction remains unchanged.

Medical practice has often had a direct and very profound influence on the development of architecture; and nowhere is this more evident than in the guiding principles of the Modern Movement. The ideas which first informed Modernism were formulated at a time when the building professions were in the vanguard of a battle against tuberculosis. Throughout Europe, hundreds of thousands of people were dying each year from the ‘white plague’, which, although in retreat, was still taking more lives than smallpox, typhoid, scarlet fever and all the other infectious diseases of the era combined. Many of the pioneers of modern architecture were involved in the construction of tuberculosis sanatoria. They were familiar with the medicine of their day and sometimes worked alongside doctors who used sunlight to cure their patients.

In 1901, the Nobel Prize for medicine was awarded to Dr. Niels Finsen, the Danish physician and scientist who discovered that ultraviolet radiation could heal Lupus Vulgaris, a form of tuberculosis thought to be incurable. Finsen’s Nobel Prize followed the discovery by two British scientists in 1877 that the sun’s rays could kill bacteria, and could do so having passed through glass. Their work prompted other scientists to investigate the effects of exposing bacteria to the sun’s rays, and it was not long before sunlight was being hailed as ‘nature’s universal disinfectant’ and an important weapon in the fight against infectious diseases. Sunlit rooms were held to be hygienic, while those that did not admit the sun’s rays were not. Architects began designing hospitals with large south-facing windows to admit direct sunlight and prevent the spread of tuberculosis and other pathogens. They built terraces and balconies where patients with tuberculosis could be exposed to the sun under medical supervision, a practice which became known as heliotherapy.

During the First World War, military surgeons used the sun’s rays to disinfect and heal the wounds of casualties on both sides of the conflict. Then in 1921, medical researchers proved that sunlight could cure rickets, a crippling bone disease that had been endemic in England, and elsewhere, for nearly 500 years. The discovery of the sanitary and then the therapeutic properties of sunlight brought about by Finsen and others had a marked effect on building design from the...
turn of the century onwards. In his influential manifesto The Sun's Path through the Heavens, he pointed out the importance of direct sunlight to health and hygiene. In his books Notes on Nursing and Notes on Hospitals, he emphasized the importance of sunlight in providing a healthy environment for the sick. This was emphasized in his Notes on Hospitals of 1859 as follows:

“Direct sunlight, not only daylight, is necessary for speedy recovery, except, perhaps, in certain ophthalmic and a small number of other cases. Instances could be given, almost endless, where, in dark wards or in wards with a northern aspect, even when thoroughly warmed, or in wards with borrowed light, even when thoroughly ventilated, the sick could not by any means be made speedily to recover. All hospital buildings in this climate should be erected so that as great a surface as possible should receive direct sunlight – a rule which has been observed in several of our best hospitals, but, I am sorry to say, passed over in some of those most recently constructed. Window-blinds can always moderate the light of a light ward; but the gloom of a dark ward is irredeemable... The escape of heat may be diminished by plate or double glass. But while we can generate warmth, we cannot generate daylight, or the purifying and curative effect of the sun’s rays.”

When Florence Nightingale made these observations, architects and doctors were still largely unaware of the health benefits of getting sunlight indoors. Her thinking on the subject was in advance of scientific opinion and ran counter to the prevailing orthodoxy, which was to keep patients out of direct sunlight. She believed that a view of the sky and especially sunlight was of the utmost importance to the sick. Something else she insisted on was fresh air, and lots of it. The air within a hospital ward had to be as pure as the air outside, without chilling the patients. Air was not fresh if it was not warmed by the sun, nor was it safe if it came from anywhere other than an open window. In the 1880s, the effect of poor ventilation on the sick and the well were not generally recognized. It was not unusual for medical staff to keep ward windows hermetically closed for fear of lowering the air temperature.

Florence Nightingale was an advocate of the pavilion system, originally a French arrangement of separate ward units. The Nightingale ward, as it became known, was extensively glazed by the standards of the day. A minimum of one large window for every two beds provided patients with copious amounts of fresh air and natural light. However, it was to be many years before her ideas gained acceptance. In 1935, the Royal Institute of British Architects published a report on sunlight penetration in buildings, in which they referred to the principles described in Notes on Hospitals, as follows: “It is gratifying to note that some architects are at last, although half a century too late, beginning to take advantage of Florence Nightingale’s common sense...”

With the discovery that sunlight could cure rickets and tuberculosis, and that it could kill bacteria, there were good grounds for getting sunlight in and around buildings. The architectural language that Le Corbusier developed from the 1920s onwards reflects this; drawing its inspiration from the sunlit ward of the sanatorium, and the terraces of the heliotherapy clinic. His iconic Villa Savoye, built near Paris in 1929, is designed for sunbathing. The living quarters on the first floor of face into a sun terrace. This incorporates a ramp that goes up to a sunbathing enclosure on the roof, which is sheltered by a screen of straight and curved walls. Le Corbusier believed the sun conferred physical and moral regeneration on those who exposed themselves to its rays. He was a keen sunbather, and...
was greatly concerned about the dangers of tuberculosis. This is clear from the book he wrote in the 1950s on one of his later buildings: L’Unité d’Habitation or Marseille Block:

“Doling out cosmic energy, the sun’s effects are both physical and moral, and they have been too much neglected in recent times. The results of that neglect can be seen in cemetery and sanatorium.”

L’Unité d’Habitation was the realisation of the mass housing schemes that had exercised Le Corbusier since the 1920s. He designed L’Unité to alleviate a severe post-war housing shortage in France. This milestone of modern architecture is arranged for sunlight and incorporates many of the features of a heliotherapy clinic. Balconies on both the east and west facades serve as sunscreens or ‘brise-soleil’ that shade the apartments in the summer months. They are also what Le Corbusier called an ‘open-air extension’ of each living room. In addition, L’Unité d’Habitation has a terraced roof that provides amenities for the residents, including a solarium.

the decline of the sun – again

Until the middle years of the last century, natural lighting largely determined the plan of a building and the design of its external envelope. But with the advent of low-wattage fluorescent tubes in the 1930s, and air conditioning, reflective glass and cheap energy, the urban landscape began to change. Daylight was no longer a critical design element, as these technological advances made lighting deep-plan buildings a practical proposition. Medicine was changing too. Improvements in living standards led to a decrease in tuberculosis and rickets; and the arrival of antibiotics in the 1940s meant that infectious diseases were much more amenable to treatment. This is reflected in hospital design where sunlit, airy wards came to be replaced by structures that were more complex, and were closed to the elements. Gradually, the emphasis shifted from putting hospital patients in wards that supported healing and prevented infection, to ones that created a comfortable and more convenient environment for patients and staff. Sixty years ago, it was well recognised that sunlit wards have fewer bacteria in them. Today it is not. However, strains of tuberculosis have emerged that are resistant to antibiotics, and one of
A hot bath relaxes body and mind – and all the more so if it is combined with a spot of sunbathing. Luminous intensities of around 2000 lux and more stimulate the circadian system and the human psyche.

Sensitivity to light and the susceptibility to certain skin diseases resulting from it is hereditary. Nevertheless, all people depend on vitamin D synthesis by the skin, for which sunlight is essential.

The so-called ‘superbugs’ that infect our hospitals is becoming established in the wider community. The MRSA bacterium, or methicillin-resistant Staphylococcus aureus, has long been a serious problem in wards and nursing homes where it infects patients weakened by disease or injury. But a strain has emerged that can infect healthy young people who have had no prior hospital exposure. With drug-resistant bacteria posing an ever-greater threat to public health, sunlight’s germicidal properties merit rather more attention than they receive. So too do the therapeutic properties of sunlit spaces.

**Bright Light**

In Greece and Rome, physicians called the emotion associated with gloom and darkness ‘melancholia’; and the idea that lethargy, sadness and despair can be triggered by low light levels is certainly a very ancient one. During the 1970s, scientific evidence emerged of a link between depressive illness and light deprivation. Based on this and other more recent findings, it has become clear that building occupants do not get enough bright light to have a positive impact on their health and emotional stability. The light levels required for this are much higher than those needed to perform visual tasks. Electric lighting developed under the assumption that the only significant purpose of light for humans is to see. Until recently, the impact of artificial light on physiological and psychological well-being was not generally considered.

A major breakthrough came in 2002, when scientists discovered a new sensory system in the human eye. This is not involved in vision: it is there to receive and respond to light, sending signals directly to the body’s biological clock. This clock, in turn, regulates the secretion of hormones and neurotransmitters in the brain. These have a direct influence on our health and the amount of light and darkness we expose ourselves to dictates when, and how much of them, is secreted.

Although bright light is known to have health benefits, and has been used to treat conditions such as seasonal affective disorder (SAD) and non-seasonal depression for some time, no one knows exactly how, or why, it works. The discovery of this new photosensitive system explains a great deal about the ways in which light affects our well-being.
In April 2005, a study published in the American Journal of Psychiatry concluded that bright light therapy is as effective as medication in the treatment of major depressive illnesses and that it has fewer side effects. These and other findings support the age-old belief that we need to be able to see some bright light, or live in sunlit spaces, to stay healthy. Unfortunately, opportunites to benefit from light of sufficient intensity to have a favourable impact on our health can be limited in the modern world. This may explain why depression is becoming so common. According to the World Health Organisation, depressive disorders are the fourth leading cause of ill health among adults worldwide, and by the year 2020 severe depression will be second only to cardiovascular disease as the main cause of death and disability. Significantly, recent studies also suggest that the modern indoor lifestyle is just as bad for our mental health as for our physical health. The pioneers of Modernism worshipped the sun’s healing powers and made good use of it, as did the Greeks and Romans. Lack of sunlight has long been associated with weak bones, weak muscles, mood disorders and ill health. The pioneers of Modernism appreciated this, and so did the architects of Imperial Rome more than a thousand years before them. As the old Italian proverb points out: “Where the sun does not go the doctor does.”

**FRECKLES**

Freckles are genetically determined deposits of pigmentation in the skin and often appear due to the influence of sunlight. Especially people who have a fair skin and are sensitive to light frequently have freckles.

Dr. Richard Holaday is a recognised authority on sunlight and health in buildings. He is Research Fellow at the School of the Built and Natural Environment, University of the West of England, Bristol, as well as the author of The Light Revolution: Health, Architecture and the Sun (Finkhorne Press, 2006) and The Sunlight Revolution: Sunlight and Health in the 21st Century (Finkhorne Press, 1999).

**INTERVIEW WITH PROF. ANGELA SCHUH**

Professor Schuh, many positive effects of exposure to sunlight, for example its palliative effect on seasonal affective disorder, are now well known. Others, such as the antimicrobial effect of the sun, seem to be almost completely disregarded in modern medical practice. Has the medical profession lost sight of the positive effects of sunlight?

Here we need to differentiate between two components of daylight that have different effects on the body: visible light and UV light. Visible light affects our melatonin levels via receptors in the eye and thus determines whether we feel awake or tired. Bright, visible light is also an effective remedy for winter depression. This has been known for a long time and is used accordingly in treating this condition. UV light has also been used extensively by the medical profession in the last few decades, for example in treating skin diseases. This is true for both artificial UV light and sunlight. Therefore, I would not use the word “disorganised” here. However, it is true that sunlight’s good name has been significantly tarnished recently due to its carcinogenic effects, and it is thus often overlooked that this effect is heavily dependent on the dosage received. In sensible doses, the positive biological effects of sunlight far outweigh the negative. Vitamin D synthesis, in fact, is just the most important. Vitamin D is formed on the skin exclusively via solar radiation. It boosts bone metabolism, prevents osteoporosis, generally strengthens the body and enhances performance. Moreover, Vitamin D even protects against a number of forms of cancer.

What positive effects of sunlight are also effective indoors if a building is designed with the sun in mind and naturally lit?

The effects of visible light also penetrate buildings. Thus, if a building has been designed accordingly, light can also work against seasonal depression and general anxiety inside it. However, it is important to ensure that the light’s intensity will exceed 2500 lux.

By contrast, human skin is protected from the effects of UV light by almost all types of window glass nowadays. So in order to synthesise vitamin D, for example, people actually do need to go outdoors.

Modern human beings often spend 70–80% of their time indoors. How important is it in such cases to allow them to experience the same light changes that occur during the day outdoors?

I think the most important thing is to ensure sufficient and consistent light exposure both outdoors and indoors during the day. When we are outside, we can start preparing for light with the aid of suitable clothing. In other words: soft light, nothing too bright. Without this change in light levels, the body doesn’t produce any melatonin, and we don’t feel tired so easily.

Around 50% of the population is sensitive to weather conditions in one way or another. Rapid reversals in conditions and sharp falls in temperature are among the most widespread meteorological phenomena to have negative effects on human well-being. To what extent should architects try to shield people from these extremes of weather – and to what extent should people inside buildings be exposed, in a controlled manner, to the same natural changes in temperature and air movements occurring outdoors?

Spending time in artificially air-conditioned buildings is generally seen as less than ideal from a medical perspective. Large, operable windows, on the other hand, are beneficial. The same applies to open inner courtyards, conservatories and balconies, in short: for all areas that allow us to expose ourselves to changing temperatures and sunlight, at least every once in a while. The body’s thermoregulatory function needs constant exercise, and it is therefore an ideal situation when fresh air can reach the skin at regular intervals. A constant, artificial uniform climate, on the other hand, allows the thermoregulatory muscles to become flabby. Incidentally, a similar effect is generated by laminar air flows, such as those created by fitted windows or ventilation slots. They form a constant draught to which the cold receptors on the skin adapt, preventing any further counter reaction from the body. That is why we can even catch cold when exposed to draughts. Turbulent air flows, such as those generated by open windows, on the other hand, allow the thermoregulatory muscles to become more effective.

Comparison studies of mortality rates in different countries have shown that the “ideal” ambient temperature for good health seems to lower for northern Europeans than it is for their southern neighbours. Is it not paradoxical, then, that it is often the better countries that have air-conditioned buildings that are even cooler than in temperate or high latitudes?

You’re right. That is indeed paradoxical, as it means the body is working with temperature changes that are far too extreme. This overrules its thermoregulation mechanism and exposes it to excessive strain. A moderate level of air-conditioning with inferior temperatures ranging between 20 and 25 degrees Celsius would be much more appropriate.

**PHOTO: RICKY JOHN MOLLOY / STONE / GETTY IMAGES**
DAYLIGHTING
The natural gift of daylight put to practice in architecture

A THEME PARK
DEDICATED
TO WELL-BEING

Thermal baths in Bad Aibling
Winter is on its way and with it the accompanying attacks of coughs, sniffles and sore throats. As we all know, hot baths work wonders for these symptoms — and for those whose bathtub at home is just too small, the option has been available since 13 September to visit the new spa complex in Bad Aibling near Rosenheim instead. The first mud baths facility in Bavaria was built here; in 1838, two country doctors and an apothecary had the idea of using the area’s natural peat deposits for medicinal purposes. They then conducted seven years of research and thus laid the foundations for the Solen- und Schlamm-Bade-Anstalt (brine and mud baths complex). Since then, invalids have come here to seek relief from their sufferings in a range of more or less appetising peat and mud baths. Marshland equals peat: architects know it, heat makes it. During a peat bath, this slowly penetrates and benefits the body, strengthening the immune system, stimulating the metabolism, and doing wonders for the hormonal balance and nervous system. Whereas in the past, treatments like these often used to be paid for by the German health insurance providers, these companies, with an eye to their premium accounts and the ageing population, are becoming more and more conservative in their approval. This strategy has naturally had an ongoing impact on traditional spas such as Bad Aibling, with retail ranges that had previously revolved around support hose, orthopaedic shoes, hearing aids, cafes and ladies’ fashions for size 42 and above. It was thus a happy chance that drilling work, right at the spot where the existing standard open-air swimming pool lay next to a leisure and sauna centre, resulted in the discovery of a hot water spring. The idea of a thermal baths, which could go beyond the health spa business in attracting guests to Bad Aibling from near and far, could admit no delay in implementation.

Four years ago, the architectural firm Behnisch Architekten won the competition to design a new baths complex with a unique concept: next to the existing sauna facility, they created a spacious spa landscape focusing on views of the surrounding area and — something that no other competitor had proposed — they relocated the new, separately accessible open-air pool, which will
continue to delight the locals on hot summer days, to the roof of the thermal baths building. The thermal spa and beauty centre is primarily aimed at attracting guests from further afield. To be precise, three hundred thousand visitors a year will have to turn up to make the investment worthwhile - that’s 822 guests every day.

At this point, it must be said that human well-being is based on deeply subjective factors. Some people are more comfortable with wellies and welding than with the ‘well’ of wellness, in the pursuit of which they are willing to be kneaded, rubbed, scrubbed, peeled or given who knows what treatment at the hands of total strangers. For example, to me Ayurveda is snake venom and saunas make me claustrophobic. But although this may be a heavy burden on the path to becoming a wellness fan, at the end of the day it is irrelevant to one’s appreciation of spa architecture.

Therapeutic jargon, of course, makes subtle distinctions: the ailing receive treatments, while in the beauty and wellness world we speak of applications – there is a reluctance to stigmatise the need for such things. When Peter Zumthor built the thermal baths in Vals/Switzerland, he created a yardstick that all kinds of spa architecture – especially in and around the Alps – had to be compared with. However, Zumthor’s cryptic style, ritually internalising the mountain backdrop, is hard to retreat from once entered; especially as in Vals there is no need to get into the water and tolerate every square metre as a spa experience. Neither is this a must in Bad Aibling. Here Behnisch Architekten chose a completely different path, one which had to be attractive to a very broad cross-section of the public – including families with small children, hairdressers, bakers wishing to be kneaded like bread dough – and had to give them their money’s worth. Beauty for men? Yes, Bad Aibling offers that too, mindful of a society that counts the visual appearance of its members as a success factor.

Harmonising a complex room schedule, including a sauna, thermal spa, beauty area and separate open-air swimming pool with demanding, in some ways, 1980s-style structure demanded a powerful concept from the architects. The spa

Previous: All-inclusive view from the south. Two of the seven domes interrupt the roof’s edge on the south side of the building. Even from outside, the different window sizes provide an inkling of the lighting moods inside.

Above: Bathing as an experience in the outdoor area: massage showers, bubble baths and a fast-flow channel are features to promote the well-being of the bathers. The thermal water of the spa is extracted from a depth of 2000 metres below ground.

Opposite: Coloured tiles suggest what awaits the guests. The “hot and cold dome” invites them to participate in an intensive experience of temperature in water. In contrast to the other domes, it is not made of concrete but of a part transparent, part Plexiglass cupola.
Opposite: Floating, letting oneself go, listening to music under water – things are comparatively peaceful in the thermal dome. Bathers who are lying down can look outside to the music of the spheres floating up from under the water. One can ‘experience water’, bathe in bubbly water like a 21st-century Marilyn Monroe in a ‘champagne pool’ – real champagne costs extra though – but also recuperate mentally with music and video projections. Then, of course, there is a Kneipp basin and a mud baths area, but also a toddlers’ area, discreetly decorated with mythical creatures and supervised by qualified staff. The new family-friendly policy is appreciated by stressed parents: mothers and fathers; in Vals, under-fives are not allowed in the baths. In the spacious facilities of Bad Aibling, there is a niche for every taste and desire: pale stoneware, the different formats of which prevent monotony, aid orientation and provide the non-slip surface the facility requires. Beside this, a range of tiles such as those found in every DIY store greet the visitor in all raised or sunken areas – plinths, basins and so on – which look exactly the same in public swimming pools as they do in one’s bathroom at home. However, it is these tiles that make one think at times of the spa: the idea is that guests should feel at home here. They can remain largely undisturbed in their favourite pools, or “experience zones” with various themes. Two of the themed domes, although they look like conservatories, are in a league of their own: the diver’s perspective. Underwater – things are much to be learned here. There are thus three themes between which the architects performed a tricky, sure-footed balancing act during this project: the design from scratch of a thermal spa complex, the refurbishment of a 1980s architectural structure and the design of a classical outdoor pool. The thermal baths is unmistakably divided into zones within which the year’s three hundred thousand visitors would be mistaken: with garden saunas, dry saunas, infusion saunas, log cabin saunas and mud saunas, there is much to be learned here. The vegetation, moreover, underpins the theme of natural continuity. To ensure that the heterogenous interior, designed to accommodate large numbers of spa enthusiasts, continued to constitute a uniform spa complex, the architects covered the floor in all areas from the foyer to the poolside – with the same material: pale stoneware, the different formats of which prevent monotony, aid orientation. The vegetation, moreover, underpins the feeling of natural continuity. To ensure that the heterogenous interior, designed to accommodate large numbers of spa enthusiasts, continued to constitute a uniform spa complex, the architects covered the floor in all areas from the foyer to the poolside – with the same material: pale stoneware, the different formats of which prevent monotony, aid orientation. The vegetation, moreover, underpins the feeling of natural continuity.
Left: The relaxation dome is in the west part of the thermal spa and is darker on the inside than the other domes. Gentle music and video projections on the ceiling transform it into a kind of multi-media cavern.

Left: The dome of the senses is the largest of the seven domes and has a steam bath on the inside. LEDs which are mounted in the ceiling and change their colour immerse the room in a constantly changing light, which almost becomes tangible due to its reflection in the highly moisturised air.

Opposite: View to the west from the dome of the senses. Several circular skylights illuminate the room, which is immersed in a deep blue colour.
Bad Aibling is a spa for the whole family. It not only has a special children’s area but also contains features everywhere which encourage the play instinct such as those floating lights in the dome of the senses.

come together to form a top-notch open-air swimming experience. Here, the scenic themes explored in the spa complex experience have been completely avoided, and it is precisely this which gives the outdoor pool a quality that had to be sacrificed in the themed “islands” of the spa complex.

Here in Bad Aibling, the architects had to succeed in nothing less than a balancing act between a log cabin sauna and Turkish bath, a provincial open-air pool and a more or less sophisticated thermal baths complex. Behnisch Architekten has succeeded, at the very least, in performing an impressive ‘spread eagle’ with a quirky mixture of informal conservatory style architecture, cheerful references to pop culture and conscientious functionality. A multicultural spa landscape has been engineered and a theme park has been filled with aquatic pleasures within which a rubber duck would not excite the disapproval of piqued VIP guests. Bad Aibling is expected to attract a different clientele from that visiting Vals – and the architects have more than catered to this market. The concept of the thermal baths is aimed not just at providing beauty and wellness services in an almost religious way for a well-heeled public accustomed to luxury, but to attract a broad cross-section of the public. Economic pressures have left certain traces in Bad Aibling, which could manifest themselves in an all too densely packed diversity of experiences in the spirit of the motto: something for everyone, so that everyone will come. The architecture of the facility does accommodate this complexity, however, it is kept in check with a wink in favour of a consistent concept.

Bad Aibling is a spa for the whole family. It not only has a special children’s area but also contains features everywhere which encourage the play instinct such as those floating lights in the dome of the senses.

**Facts**

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<thead>
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Dr. Ursula Baus is a freelance architectural historian and critic. Her publications in magazines and books focus on contemporary architecture and architectural theory as well as on the history of engineering in architecture. She is the co-founder of frei04 publikat and, since 2004, has been teaching architectural criticism and theory at Stuttgart University.
Above: In 1998, the Netherlands artist Joost Veerkamp drew this view of Zonnestraal’s main building. The southern facade is almost completely glass. Large sun terraces were created on the flat roofs of the building and the occupants were thus encouraged to spend long periods outside during the day.

P36–37: Zonnestraal at dusk. The sanatorium is located in a large park without any direct neighbours. As a result, the buildings, which are transparent on all sides, extend far into the landscape.

ZONNESTRAAL SANATORIUM
The embodiment of light, air and space

By Hans Ielings

Sunlight and fresh air, hygienic living and better working conditions for the masses were the main goals of architectural modernism. The latter had its roots in the fight against devastating epidemics and therefore found its purest form of expression in the large sanatoriums of the 1920s, such as the Zonnestraal building by Jan Duiker in Hilversum.

Zonnestraal sanatorium (1916–1918) in Hilversum is regarded both inside and outside the Netherlands as one of the high points of functionalism. In the Netherlands it is equaled only by the more or less contemporary Van Nelle Factory in Rotterdam, designed by the firm of Brinkman & Van der Vlugt. Both buildings embody in a convincing, even compelling form, the essence of functionalist architecture – the provision of light, air and space. In the case of Zonnestraal, designed by Jan Duiker, Bernard Bijvoet and Jan Gerko Wiebenga, the name alone – ‘ray of sun’ – says it all. Sunlight and fresh air were essential for the recuperation of Zonnestraal’s tuberculosis patients and so functionalist architecture was an entirely logical choice.

It is certainly no accident that functionalism found such wide acceptance for hospitals and related building types. Zonnestraal, Alvar Aalto’s sanatorium in Paimio, the French hospital designs of Paul Nelson, as well as various open-air schools and the modernist holiday camps built throughout Fascist Italy to build up the strength of undernourished city children – they are all examples in which modern architectural principles and contemporary medical thinking coincided, united by the common theme of hygiene. The significance of hygiene in medicine is obvious, but hygienic principles are just as firmly entrenched in modern architecture. With its dazzling white, shiny, smooth-tiled, chromium-plated, glazed and plastered surfaces, modern architecture appears as clean and spotless as freshly washed terry towels. Modern architecture was also implicitly, and often even explicitly, regarded as a form of medicine. It offered an architectural and town planning ‘cure’ for human beings and for the built environment itself. From this perspective, just about all modern architecture and town planning can be construed as medication for a dying city, insalubrious living conditions and unhealthy, sometimes even life-threatening working conditions. Behind many of the principles of functionalism, from the spatial separation of home and work to the emphasis on row housing for optimum insulation, lie hygienic considerations prompted by the conviction that the city and its inhabitants should be made healthy. In few buildings do architecture and health coincide more convincingly than in the Zonnestraal Sanatorium, whose architecture is as radiant as its name. Zonnestraal was a collaborative effort by three contemporaries: the architects Jan Duiker (1890–1931) and Bernard Bijvoet (1889–1979), and the civil engineer and concrete expert Jan Gerko Wiebenga (1886–1974), who also had a hand in the Van Nelle Factory.

The client who commissioned Zonnestraal was a trade union, the Algemene Nederlandse Diamantbewerkersbond (General Union of Dutch Diamond Workers, andb), which had already demonstrated an interest in architecture. Around the turn of the century, h.p. Berlage, the godfather of modern architecture in the Netherlands, had built the union’s head-quarters in Amsterdam. The same Berlage was approached by the union at the end of the 1910s with a request to design a convalescent centre for tuberculosis patients but, too busy to do it himself, he passed the commission to his young colleagues. His choice of Duiker and Bijvoet was no arbitrary decision, but closely related to a recent competition for a building to house the Rijksacademie van Beeldende Kunsten (State Academy of Fine Arts). Berlage, who had been on the jury of this competition, was greatly impressed by Duiker and Bijvoet’s entry which had been awarded first prize.

Zonnestraal Sanatorium was paid for by members of the diamond workers union, who had been contributing since 1905 to the Koperen Stelenfonds (Copper Handles Fund). The fund was made up of the proceeds of the recycling of the copper handles that the diamond cutters used to position their stones during cutting. This ductile and pliable metal made it possible to fix the diamond at precisely the right angle in relation to the wheel used to cut the facets. In time, the copper handles snapped off as a result of metal fatigue and were collected by the Koperen Stelenfonds, which was so successful that the fund soon found itself with more money to spend on combating TB than the Dutch government. As such, there was no longer any need to restrict their aid to their own members.

The success of these collections made it necessary, and financially possible, to expand the nursing capacity for TB patients. The result was a plan to build their own convalescent centre. After some vacillation and a false start elsewhere, a piece of woodland in Hilversum was purchased in 1913 and Duiker and Bijvoet were commissioned to design the complex. In 1916, Duiker delivered the definitive design, comprising a main building and four pavilions, only two of which were actually built.
At the time when they received the commission, the work of Duiker and Bijvoet still belonged to the (brick) tradition of Berlage, which was no doubt one of the reasons why the old master held their work in so high regard. In the early 1920s, however, Duiker and Bijvoet emerged as leading exponents of functionalism. In the same period, Wabenga realized the building that is often regarded as the first example of functionalism in the Netherlands, the Intermediate Technical School in Groningen (1922).

During the design of Zonnestraal, Duiker and Bijvoet went their separate ways. Duiker went on to build the Open - re-emerged as the designer of a large number of high-quality machine-like aspect of this architecture. During the design of Zonnestraal, Duiker and Bijvoet adorned it with a wide roof terrace in order to bring daylight into the middle of the room.

PHOTO: MICHEL KIEVITS / SYBOLT VOETEN

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At the design of Zonnestraal, Duiker and Bijvoet went their separate ways. Duiker went on to build the Open-lucht school voor het Geszond Kind (Open Air School) in Cliostraat, Amsterdam, a building closely related to Zonnestraal in architecture and approach, and, also in Amsterdam, the Citroen, a cinema that showed non-stop newsreels.

Bijvoet moved to Paris in 1925 where he worked with Pierre Charteau on the celebrated Maison de Verre and from where he kept in touch with his former partner. In 1933 he returned to the Netherlands to complete the Grand Hotel Golfstrand in Hilversum which Duiker had been working on at the time of his premature death. After the Second World War and in partnership with the younger architect Gerard Holt, Bijvoet re-emerged as the designer of a large number of high-quality concert halls, although they never attained the architectural heights of Zonnestraal. The building is copybook example of the functionalist ideal that Duiker and Bijvoet demonstrated to the functionalist character of their building.

Zonnestraal consists of a main building flanked by two pavilions. On the first floor of the main building was a dining hall. Duiker and Bijvoet adorned it with a wide roof terrace in order to bring daylight into the middle of the room.

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PHOTO: MICHEL KIEVITS / SYBOLT VOETEN
DAYLIGHTING

The natural gift of daylight put to practice in architecture.

HOME AWAY FROM HOME

Special school in Schwechat

Text by Jakob Schoof.
Photos by Adam Mark.

The fasch&fuchs special school in Schwechat offers its 83 pupils a rehearsal stage for life, upon which they can practice all important human behavioural patterns. Just as the outside of the building gives a dynamic impression, the rooms inside allow just as much freedom of movement for the pupils – and not only in the gymnasium, the open mid-point of the new building.
The room as a teacher – who would not want to agree with that? But much is demanded of this teacher every day at school – to provide space, room to develop and shelter. And on top of that (as every good educationalist is aware), it must be responsive to the individual needs of the children and adolescents. “81 schoolchildren with 81 learning objectives,” as headmistress Ingeborg Schramm says, attend the ten classes of the special school in Schwechat. Many of them have multiple disabilities and require particularly intensive attention and care, besides the ‘normal’ school day.

So it is all the more astounding that the special school was housed for a long time in a traditional schoolhouse on the town’s main square. Despite the central location, contact between pupils and the public was almost zero. Looking back, Ingeborg Schramm describes the rooms as “unacceptable” – there were neither enough classrooms in the school nor a staff room or working rooms – not to mention facilities for intensive mentoring.

A window into the future was opened for the special school in 2000, when more than 100 architects took part in an open competition throughout the EU for a new school building. “Effective sound proofing, low-energy building and favourable building costs were some of the hard facts the builder-owner had demanded,” recalls Hemma Fasch of the architectural firm fasch&fuchs even today. “The users, in particular the headmistress, tried to communicate the ‘soft factors’ early on in the competition: the behaviour of the pupils, their position in society and the challenge to promote their development and, in so doing, to support them in leading a ‘normal life’ as far as possible.”

For disabled children ‘to live normally’ does not just mean gaining the self-confidence to see themselves as a part of a community and yet still be able to withdraw if they want. “The children need protection from the outside world and from ‘enemies’, such as unwanted people, bad weather, noise and information overload, without feeling locked in,” adds Hemma Fasch. The relationship between inside and outside, as well as between openness and protection, was thus a central topic of their discussions with teachers and schoolchildren. The special school borders on the public park of Brendani Gardens to the north, with traffic rushing by in and out on federal Highway 10 to the south. Furthermore, the proximity of Vienna-Schwechat airport meant considerable disturbance from noise. The school (including the gymnasium, which is half buried in the terrain) therefore opens outwards to the north over three levels with large areas of glass but ducks under the traffic noise in the south. Here the glass skin of the roof reaches down to the ground and encloses a conservatory that also serves as an extended play and adventure area for pupils in the special teaching rooms. Three of these rooms for physically and multiple-disabled schoolchildren, a teaching kitchen and the physiotherapy area with swimming pool are situated on the south side at ground level. A sliding sun-shade of aluminium lamellae is intended to protect the rooms from extreme temperature variations. “The building shell offers the children the possibility of observing their surroundings from the shade of their hideout, it enables them to make contact and to step freely outside. By first interacting through the facade, the children can decide whether they want...
contact with the outside world or prefer to stay inside," say fasch&fuchs, explaining the advantages of the complex roof and facade construction.

The reasons for the open spatial concept of the school with its numerous views – also between the levels – are to be found in the architectural stance of the architects, as well as in the children’s need for feeling safe and secure by knowing where they are in the building at all times. "The inner transparency gives the children an impression of all the activities taking place inside the building," states Hemma Fasch. The open, emotional centre of the new building is the two-level gymnasium that extends from the basement to ground level. Wall bars separate the hall from the surrounding corridors and equipment rooms in the lower level. A gallery on the entrance level above runs around the hall; step seating invites passers-by to linger and watch. "Every child is a member of the community and at the same time a Robinson Crusoe," comments Hemma Fasch. "Here in the middle of the building, children can experience companionship and strangers are also allowed into the building up to this point. The children can observe them and still be sure they can withdraw again at any time. The centre is thus opened to the world and at the same time a kind of protective shield for the privacy of the children."

lead to the semi-private and private parts of the building via the stairs to the classrooms and terminate at the intimate withdrawal alcoves. Seven of the ten classrooms are situated on the north side on the upper level above the gymnasium. Two of them separate a so-called ‘time-out’ room, a cushioned cell which is lighted from above, in which pupils can quickly calm down if they become aggressive. The corridor in front of the classrooms is also totally different from the traditional ‘barracks style’ school architecture: at both ends it offers views of the surroundings and is interrupted here and there in front of the classrooms by niches to hang clothes that help encourage communication between the schoolchildren.

Virtually every room in the building gets daylight from at least two sides – including the roof areas. This reduces the glare from incident light. Many inner partition walls are not the same height as the level

The swimming pool is one of the school’s most popular facilities. It is an extension of the conservatory on the ground floor and is also used for therapeutic purposes.

The complex folded roof shape enabled architects fasch&fuchs to supply nearly all areas with daylight from two sides.
and with the help of numerous working warm in summer, our school is a paradise way – initially with their own experience skylight strips. Such details are essential to school changes all the time, both during the day and the seasons.”

The daylight concept has been developed by fasch&fuchs in quite a traditional way – initially with their own experience and with the help of numerous working models, but without computer-aided simulation. If one asks the users what they think, the response is overwhelmingly positive: “Although some rooms can get quite warm in summer, our school is a paradise for the pupils, teachers and visitors,” says headmistress Ingeborg Schramm. A mother whose son started at a few months ago described the school as “an oasis of light and hope.” Above all the school has become a real second home for the children, as is obvious from the comments. Not just because the schoolchildren are looked after here from 0800 to 1700, whereas most schools in Austria are only half-day tuition institutions. Ingeborg Schramm tells us that the children feel so at home in the building that some of them simply do not want to go home at the end of school. This is probably a much more essential quality criterion than interdisciplinary benchmark tests and other offspring of educational bureaucracy, particularly for a special school.

The daylight concept has been an essential quality criterion than interdisciplinary benchmark tests and other offspring of educational bureaucracy, particularly for a special school.

At present, our school has 85 pupils between the ages of six and eighteen divided into ten classes. They are all school five days a week from 8 am to 5 pm. They all have special educational requirements. Some of them suffer from Bowes’s syndrome, some from Polio-Erdheim disease and others have various congenital genetic defects. There is also one Intensive Care class for children with extreme behavioural handicaps and other development related learning handicaps.

All those different needs place special demands on the physical design of the school building. One example of such a design decision is that the classes for the seriously handicapped children take place on the ground floor and are easily wheelchair accessible. Each of these classes also has direct access to the garden via a winter garden. One of the pupils in those classes is Minnea, who suffers from Cri-du-chat syndrome (cat cry syndrome) and is severely mentally handicapped. She loves playing with light and shadows and spends a lot of time in front of the huge glass wall that separates the garden from the classroom and uses the incoming light to project shadow figures onto the wall.

In contrast to our old school building – a simple structure with badly lit cave-like classrooms – our new school is bright and calm building that lets you experience nature’s changes during the year. The sports hall is the heart of the school. It’s a meeting point for the pupils during the break and other events. The children can move around freshly without putting themselves or others at risk. Even though many pupils attend this school now than in the old school, it seems that everything calmed down a little bit. You can feel this during the classes as well in the school breaks. Except for the ‘Smokemoven Room’ every room is lit by direct sunshine. The children often stand by the big glass windows in the upper floor to look out and enjoy the view or to just talk and learn or play. The overall mood during the day is calm and relaxed. Even in the teaching breaks, when it used to be noisy and hectic in the old school, it is nice and calm now. One of our special features is the indoor swimming pool. Some children ask me daily if they may come to school at weekends too, because they really like to be there and play in such a nice environment. I’d also like to mention that it is not just the children who like to spend their time at our school – even the teachers use their time to chat, prepare their classes or sit together and socialise at the school.

Every evening we have to ‘light’ with some children who simply don’t want to leave school and go home. Hanna, for example, cries every day when she has to leave school. She has a loving and caring family but her mother often has to work and so, until Hanna is ready to leave.

When I became principal four years ago we had 57 pupils. Now we get two or three calls a week from parents asking if we can accept their son or daughter in our school. Everyone describes our school as a place of peace and harmony. People often mention qualities like openness and friendliness when they visit our school. One of our parents recently expressed his thoughts about our new school in a letter. “I love my Pascal, even though a handicapped child can bring a lot of chaos to the family. To us, it brought a divorce and a lot of sorrow, and we never felt at home.” On the 20 January, my son and I were on our way to the new school in Schwechat with heavy hearts at the prospect of an unknown future in the new school. Then we took our first steps into the school and all the sorrows were left behind on the school. The school felt like an oasis of light and hope. Its wonderful atmosphere of harmony engulfs everyone from the first moment. Maybe this sounds like an exaggeration, but it is just as I have described. Thank you for this wonderful building.”

But there’s also a saying in Austria where there is light, there is also shadow. That’s also true for our school. A building with a lot of glass doesn’t only have advantages. The glass parts in the winter garden are dusty and dirty from the rain, but cleaning is pretty expensive – so the glass stays dirty. In the school kitchen the glass is equipped with a rain sensor, so you can open it when it is raining and on very sunny days the winter garden gets hot. That’s all – honestly.
VELUX INSIGHT
Architecture for people – building with VELUX.

LEARNING THROUGH LIGHTNESS
Primary School in Kingsmead
With his highly regarded new primary school in Kingsmead, a town in the north of England, Craig White and his office, White Design, achieved two objectives: the building is not only an ideal learning environment for schoolchildren, offering a great deal of daylight and fresh air, but also allows them to gain first-hand knowledge of the advantages of a new, lightly built architecture which is oriented to ecological criteria.

When Cheshire County Council placed their advertisements for new teachers to run their new £2.4 million sustainably designed school, they were taken aback by the level of interest in the posts – over four hundred applications – remarks the head teacher, Catriona Stewart. That interest, however, was only the beginning for Kingsmead primary school. Ever since opening in the autumn of 2004, Stewart and her colleagues have been showing architects and planners, educators and teachers, as well as politicians and journalists round Kingsmead primary school's friendly, warm spaces on a regular basis. The school in north west England has won a string of awards in the UK, and set new standards for sustainable schools for the future (BSF) – and this in daytime. That school’s electric light is more human to work under and reduces light fatigue and the 'institutional' feel to the school, as well as cutting our carbon emissions.' She mentions another head teacher she met at a recent schools conference who had taken over another brand new building and found her budget being eaten away by the need to light not only much of the school but also much of the playground.

Kingsmead was an early result of a Cheshire County Council policy review document in 2002/3 that committed the County to a further 'greening' of its building stock. The County Council worked in a partnership that included developers Willmott Dixon Construction and White Design, who applied a joined-up sustainable systems approach to the design and construction process. Titled Re-thinking Education, the approach draws into the mainstream many well-known sustainable ideas – including using local contractors, emphasis on natural materials, minimising waste through recycling and high value design. The long, north-facing, crescent-shaped building, comprising 7 classrooms for 210 children, is in the middle of a new mid-range private housing estate. The developer donated the site to the County Council in exchange for allowing the development of the estate. While many children walk to school from these local homes, it would be interesting to know how sustainable the school design and construction process actually were.

The building itself sits on a piece of open land amid a new residential development, curving in a concave semi-circle shape away from the entrance, protecting the large playing field on the far side of the school. The entire single-storey building is clad in natural materials, giving the school the feeling of warmth characteristic of this renewable material. The sustainability dimension is also immediately evident in many other examples throughout the building. This is because White Design’s approach to school buildings seeks to promote the sustainable elements as learning and teaching instruments, helping children to become more aware of how the different aspects of a sustainable building actually work. So while the inserted roof held a £28,000 photovoltaic solar energy array, 4 Solar twin water panels (heating an expected 30% of the school’s water needs) and a rainwater run-off system, far more interesting for the children is a vertical perspex pipe in the foyer reception area. Rainwater runs through this pipe before being re-used in the toilets around the building, vividly demonstrating to the children exactly how much run-off there is and how it is being re-used. Similarly, there is an electronic measuring device in the corridor showing how much water is being collected and in the adjacent library, a Solar twin panel has been donated by the manufacturer, providing tactile ‘before your very eyes’ experience of how this piece of kit works.

Previous: The Kingsmead Primary School was made almost completely of wood. Its robust architecture leaves enough leeway for artistic creativity and the children’s need to move about freely.

Below: Cross-section with ventilation concept

Opposite: The concave entrance side of the school faces the street. The teacher’s room and the offices are located here. The schoolchildren can park their bicycles under the projecting roof.

Text by Oliver Lowenstein. Photos by Torben Eskerod.

Photos by Torben Eskerod.
Stewart has also made the most of the specially designed corridor area, which includes a cooking and home economics area. The cooking area is used to introduce elements of the maths and science curriculum, through counting and measuring processes. The school also uses the area to cook the school meals from fresh raw materials, which, while not particularly new to some parts of European educational thinking, has not been much incorporated into recent English educational practice. With an extensive expanse of open land, the school has been growing organic foods, which, when ripe and ready, are then eaten by the children – the ultimate in learning by doing. Apple trees and a small organic garden are used by the children in a hands-on approach.

In terms of its reception across the British educational and school design scene, Kingsmead School has been a success. It is used as a template by Cheshire County Council both for further new schools and in other building types across its public sector stock. Post-occupancy evaluation research has shown that many of the sustainability aspects are not working to expected levels of efficiency but these issues are being addressed. Since Kingsmead’s completion, White Design has been refining this building model for a number of other schools in different parts of the country. Today, almost three years since the school opened, the architects have moved on to what they call Kingsmead 2, with a new primary school building in South Wales about to open. With the BSF programme well and truly kicking into gear – the third and fourth of its fifteen waves are now at different stages of completion – schools like Kingsmead continue to set the agenda of what is expected in UK school building design culture.

Oliver Lowenstein runs the green cultural review Fourth Door Review (www.fourthdoor.co.uk). The new edition, no 8, out this autumn features a special focus on sustainable school buildings, with White-Design’s Linda Farrow writing on the role of systems theory in designing schools.
1. The facade seen from the north is highly varied in spite of the social method of construction. All the classrooms receive daylight through two rows of windows, one of which is at eye level and one just under the roof. Small winter gardens serve as emergency exits and extensions to the classrooms.

2. Two solid glued wooden trusses along each axis of the building support the roof which rises towards the north and south. The facades were paned with red cedar.

3. Ground plan

INTERVIEW WITH CRAIG WHITE

Mr. White, your practice has designed a number of new schools of the highest environmental standard in recent years. What do you consider the main challenges in contemporary school buildings?

In the UK, one of the main challenges is connected with the structural problems of how we provide funding for this massive school building programme, which is called Building Schools for the Future (BSF). There is a vast amount of duplication in the preparation work. It is a waste of time and not delivering what we need. One way round this has been the One School Pathfinder schools, which is locally funded alternative to BSF. Each local authority is able to test a building and other approaches through this separate Pathfinder funding strand. This is happening all round the country, including Manchester where we have just handed over a new school, and also Chesholme, which resulted in the Kingsmead School.

Another challenge is the quality of the design. We’re able to engage in design, while many practices still consider school as boxes, where teaching takes place. When architects are designing schools, it is important to realise that those who will inhabit it are people. So a participatory approach for the hundreds of people who will have great potential. Some architects may pay lip service to this but once awarded the contract they will get on with their design. But the participatory route has a very liberating power tool. We attempt to engage all stakeholders – head teachers, teachers, pupils – right from the beginning, to enable them to get the most out of it. It is a very participatory, which is very important. Young people, and also staff, have brilliant ideas. These can be integrated by using the school-building process as part of the teaching and learning process.

What does the term ‘sustainability’ mean to you – and White Design?

First of all it means understanding the impact we, the industry and individuals, have. And not just in the sense of having seen Al Gore’s Inconvenient Truth film. You have to consider all the consequences, which include the environmental, economic, social, and look at each of these and what their impacts are. People underestimate what these impacts are. In terms of specification, people have to understand issues such as – do you know the mate takes and products you’re using. Where have they come from?

This comes from the initial question of knowing that if we build, it will have a fundamental impact in one shape or form. We accept that, although there are some who say the answer to that question is to stop building. You have to look at all the impacts of engineering and designing buildings. In the UK, 48% of carbon emissions is attributable to the building sector and 20% of building materials end up on landfill sites. This is changing because of more stringent regulation and it’s a matter of both cost and risk. These stringent regulations and energy studies are raising the bar. We would even pose the question of whether it should not be illegal to be building bad-quality schools and other buildings.

Many practices can hardly keep up with the cycle of new, updated regulations every few years. The environmental imperative is forcing the industry into having to do this self-regulation or practice in a different way. When we talk with other practices, we offer the advice that if they aim only to keep up with the regulations they’ll be out of date. We say you need to be targeting for 2050 and working from there. The architectural worlds need to understand and get beyond this short-term approach, although it is hindered at present by various differing guidance conflicts. While some practices continue to adhere to minimum standards, I think, this will soon be perceived as not being enough.

Are health and sustainability issues particularly important in buildings for children, such as schools?

Health and well-being in schools are intrinsically linked to sustainable design. To reduce energy consumption, we design buildings to maximise on naturally daylight and ventilation. Both of these have direct and measurable positive impact on teacher and student performance. Professor Brian Edwards from Edinburgh College of Art School of Architecture surveyed 42 ‘green’ schools and 42 conventional ‘ungreen’ schools. His reported results were higher exam performance and improved teacher retention and recruitment costs.

How important is daylight in your work, and do you think its importance in architecture has increased over the last decades?

I’d like to turn the question around, and ask why should it not be improved? In terms of natural lighting and ventilation by passive means, we introduced natural ventilation and daylight as a core principle in our design. These deliver healthier environments and healthier children, which contributes to improved learning outcomes. This is backed up by high level research – for instance Lisa Heschong of the Heschong Mahone Group in the USA. Heschong has contributed significant level research using very, very large samples – around 3,000 – over long periods of time. She showed that access to natural light and ventilation speeds up the ability to learn in both maths and reading.

In the US about a decade ago it was policy to teach in what we, in effect, enumerate, artificially lit rooms, with neither windows nor English light. Many practices are hardly able to do by 2050. This also is an influence on work environments. In today’s context but in what we will term ‘the green living, learning and teaching buildings’.

For us designing a building is a moral imperative for you and that it should be made legally binding, or is it ‘just’ a business and ought to be regulated by the free market?

For us designing a building is a moral issue. I would prefer to build the normal bulk builders why they would want to signal buildings that deny the spirit that is working, living, learning and teaching in it? Why would you want to build a box that is dulling rather than uplifting?

This ethical dimension is also being seen at a corporate and social responsibility level. I actually think some of industry is ahead of the government and way ahead of the architects. It has set an interesting challenge to the profession. In terms of what is happening here compared to the rest of Europe, although I haven’t practiced in Germany or Denmark for two years, these countries are ahead of the UK at a regulatory level in day-to-day practice, although they may appear to be a bit backhanded, slack and complacent – they take sustainability as a matter of course. Efforts have not progressed quite so far in the UK. There is a momentum here at the moment that suggests our architects could catch up and leapfrog what is happening in parts of Europe. The challenge really lies not in today’s context but in what we will do to by 2050.

Interview by Oliver Lowenstein

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1. See Brian Edwards: Green Schools: Speculations on the relationship between design and performance with particular reference to Hampshire

2. Lisa Heschong’s research can be found on her practice’s website www.h-m-g.com
VELUX DIALOGUE

VELUX Daylight Symposium
6–7 May in Bilbao

MORE LIGHT!

We all know what daylight is. But do we? The 2nd International VELUX Daylight Symposium, held in May at the Guggenheim Museum in Bilbao, presented a host of new findings about daylight, as well as new tools for daylight simulation and evaluation.

Daylight is complex and, as many speakers argued, architects and engineers will have to embrace this complexity in its full scope, while at the same time making it manageable in the design process.

What do sailing and architecture have in common? Far-fetched as it may seem, this question may have arisen more than one participant at this year’s VELUX Daylight Symposium, which was preceded by the award ceremony of the VELUX 5 Oceans Race. Only four out of seven single-handed sailors who had taken up the race in October 2006 had finished the three legs of the race, enduring up to 159 days of thunderstorms, heavy seas and chronic lack of sleep.

So what do sailing and architecture have in common? What is important in both cases is not only the sparing use of resources and the quality of the materials employed, but also the way in which people and technology interact. However, another important question in both aspects of life is how people act and react towards nature. Should they try to master it while paying the price of failure, should they allow nature to direct them as it will and go along with the flow, or should they try to avoid extreme situations by taking appropriate action in advance and thus still succeed in arriving at their goal? One of the reasons why Bernard Stamm from Switzerland, the undisputed winner of the VELUX 5 Oceans Race, was so successful is said to be that he sailed his yacht, Cheminées Poujoulat, in such a way as to minimise stress on the material at all times, even in the heaviest storms.

As in the area of sailing, the use of daylight in architecture concerns new uses for one of the oldest and most environmentally compatible sources of energy that exists. The influence of the climate and daylight on the human body and the latter’s physical well-being, as well as the goal of not only withstanding the elements but also making profitable use of them, were key points in the discussions during this year’s VELUX Daylight Symposium. This series of events started in 2005 in Budapest and, in future, the symposiums will take place regularly every two years to enable representatives from research and practice (light planners, architects, college teachers, home construction companies and people from the political scene) to take part in a professional dialogue and exchange of ideas.

Light and Health: old knowledge and new discoveries

In Budapest in 2005, the symposium had focused on how daylight conditions in buildings could be defined in a simple and understandable, but comprehensive, way and how the best possible use of daylight in the built environment could be achieved. This discussion continued in Bilbao but was complemented by a second, equally important topic: how does daylight, including direct sunlight, affect human health and well-being, as well as on human learning and working performance?

James Benya, head of Benya Lighting Design, Professor of Environmental Design at the University of California and moderator of the symposium, says: “In the past two decades, medical and health research has begun to focus more on light and its effect on human health. Beyond sleep disorders, the profound role of the circadian rhythm and the cycles of endocrine activity became undeniable. At long last, a unified understanding of light and its impacts on the human, from vitamin D synthesis to the vast array of body activities directly affected by light, has been accepted.” According to Mr. Benya, there are two main drivers in the development of daylighting solutions for buildings at the moment: the energy and environmental issue, as well as human health and performance. “Studies conducted throughout the world, as well as a growing number of codes and standards, all support the need for daylight and a view. While the cause is not yet totally clear, the effect is repeatedly demonstrated through research of many different kinds.”

Richard Hobday, an expert on daylight and human health from the University of the West of England, stressed the importance of direct sunlight for life, and hence, for architecture: “Sunlight has been used as a medicine for thousands of years. The ancient Egyptians practised sunlight therapy, as did the Greeks and Romans, who had solariums on the roofs of their houses where they could sunbathe for health.” According to Hobday, widespread problems such as vitamin D defi-
And even people in very sunny countries do not necessarily get a lot of exposure to sunlight, because they have adopted western lifestyles.”

Also, there is little point in trying to escape the circadian rhythms that are imposed on us by the sun, says Richard Hobday: “The sun is the single most important influence on the human body’s biological rhythms, more so than the normal daily routines of breakfast, work lunchtime and so on. People who do not expose themselves to the sun can feel permanently jetlagged.”

Light and learning: the sun as the ultimate teacher

Few people have conducted as profound research on the effects of light on human learning as Lisa Heschong. Heschong, an architect and head of the Heschong Mahone Group in the USA, has carried out studies with thousands of students in the western USA in which the effects of spatial qualities such as classroom size, orientation, daylight and view on pupils’ learning performance were assessed. In almost every single study, daylight and views out of windows were among the most consistent factors with a high influence on students’ learning. They were much more significant, in fact, than the number of pupils per class or absenteeism rates.

In her presentation at the VELUX Daylight Symposium, Lisa Heschong pointed out the reasons for this: “Light is a ‘drug’ that stimulates the production of serotonin, dopamine and gamma-aminobutyric acids in the human body, enhancing impulse control, motivation, muscle coordination, calmness and focus.”

Problems with insufficient daylight, lack of a view to the outside world and insufficient space are nothing but a faint memory now at the special school for handicapped children in Schwechat, Austria, the main case study that was presented during the first half of the VELUX Daylight Symposium. Head teacher Ingeborg Schramm, herself a speaker at the symposium, said: “In contrast to our old school building—a simple structure with badly lit cave-like classrooms—our new school is a bright and calm building that lets you experience nature’s changes during the year.”

The new building, designed by architects fasch & fuchs from Vienna, allows not only more daylight in, but also provides more openness in a literal sense, as Hemma Fasch, principal of fasch & fuchs, explains: “To plan with light means much more than just to put glass in a building. Our intention was also to give a sense of self-confidence to the children by exposing them to society to a certain degree.”

Tools for daylighting design: cardboard or computers?

One of the main characteristics of the new school at Schwechat is its playful complexity. In this respect it may come as a surprise that the daylighting design for the building was developed entirely with ‘hand-on’ methods such as cardboard models, but without the aid of advanced computer simulations.

This is by no means atypical in contemporary architecture. While the building design process, including structural engineering and climate design, is largely computerised already, daylighting design still largely relies on ‘rules of thumb’, personal experience and, at most, large-scale physical models. For how long will this situation last?

Jan Egholm, professor at the Royal Institute of Technology in Stockholm and moderator of the second part of the symposium, observes: “The complexity of the daylighting planning process will increase. As a consequence a suitable design methodology and new design tools have to be developed. Questions that have to be discussed are: What do the new tools offer and what do we really need? and Is there a risk that we are missing some really essential qualities?”

Magdal Bodart, a researcher and teacher at Université Catholique de Louvain, is strongly in favour of traditional methods, especially in architectural education. “Experience indicates that it is essential for architects to personally appreciate the luminous environment of a space and to compare several solutions quantitatively and qualitatively. This intuitive appreciation obtained by scale models and the three-dimensional perception of the light distribution cannot currently be obtained by use of computer simulations. Moreover, the correct use of a daylighting simulation program is too complex to be taught in that context.”

Zack Rogers, head of daylighting consulting for the Architectural Energy Corporation (AEC) in the USA, points out that there is a huge variety of computer programs available on the market that assist architects and lighting designers at virtually every step in the design process. He adds: “When designing a building, architects should think about daylighting from the very beginning, as questions of siting and building orientation are vital.”

The demand for easy-to-use tools that take into account direct sunlight and shading, orientation of the building and climate data to immense, and computers seem to be a more-than-welcome help in this respect, as they also allow for greater interactivity and quicker changes in the designs. In his presentation at Bilbao, Henrik Wann Jensen, chief scientist at Luxion in California, presented a method by which the visual appearance of a substance, including colour, transparency and refraction of light, can be simulated based solely on the molecular structure of the substance.

Beyond the Daylight Factor

In the discussions at the Budapest Symposium in 2005, participants had already perceived a need for new methods to calculate, simulate and assess daylight in buildings, and eventually also for new legislation that make their use mandatory. As John Mardeljevic, a researcher from De Montfort University in Leicester, explains: “The Daylight Factor method, established a half-century ago, is still the most commonly used approach to determine a quantitative measure for daylight in buildings. Despite the fact that its limits are manifest, it continues to be the dominant approach because of its familiarity and simplicity rather than as a reliable measure of daylight provision.”

Christian Vogt, lighting designer at Vogt & Partner in Winterthur, says: “At the moment, the daylight factor is still the best—and only—measure we have at our disposal.”

Others were more critical towards this measure, which is founded on illumination ratios under a standard overcast sky. They criticized the orientation of the building and any notion of climate. Lisa Heschong says: “The daylight factor is useless yet very crude. New tools are needed that take account of the variability of daylight, and of climate issues.” Yet these tools, she maintains, must not make things unnecessarily complicated: “In daylight design, architects basically have to deal with too much information. The future challenge will be to work this complexity into a simple guideline.”

One concept for a new measure in daylighting was presented by John Mardeljevic at the VELUX Daylight Symposium. It is based on what Mardeljevic calls ‘useful daylight illuminance (UDI)’. UDI defined as the time per year when the illuminance levels in a given spot in space are between 100 and 2000lux, i.e. in an area in which daylight can make a substantial contribution to the lighting of a space, while at the same time avoiding excessive glare.
The need for daylight – and for continued dialogue

Whatever methods of calculation will finally be universally accepted, the need for a change was perceived by many participants at the Symposium. "It is time for architects, engineers and designers worldwide to always consider the impacts of daylight on human health and performance in the design of the built environment," says James Benya. "Beyond good design practice, it is perhaps time to demand daylighted buildings through codes and standards that make well-daylighted buildings the rule rather than the exception. In schools, where mankind’s future spends much of its waking hours, it’s a no-brainer."

Moreover, daylight has proven to be a priceless but cost-free tool to reduce energy consumption in buildings, as Magali Bodart observes: "In the framework of global climate change, the good integration of daylight in buildings leads to reduction of energy consumption and is a way to sustainable architecture. However, for most architects, daylight remains a theoretical concept as they never really take time to study and to experiment this field. For these reasons, it is essential to teach daylight to architects during their studies."

Lisa Heschong points out that architects should by no means be afraid of the complexity of daylight. "Daylight is highly variable. So embrace this variability! Play with daylight, don’t fight it, take advantage of it – but don’t necessarily build the place that always provides ‘perfect’, uniform light conditions."

Daylighting, as one of the last fields in building design, is now probably replacing ‘rules of thumb’ with advanced tools for modeling and simulation. The resulting increase of accuracy, speed and interactivity will be a benefit to the whole building sector – if the new tools are easy enough to operate for a broad variety of users. In any case, there is plenty of movement in the field of daylighting, and plenty of demand for continued, interdisciplinary dialogue. The VELUX Daylight Symposium has proven to be a unique platform in this respect as well as a showcase for up-to-date daylighting solutions. As one delegate from Poland put it: "Thank you very much for inviting us to this conference. It is essential for us to recapitulate the value of daylighting. It may have been abandoned for a while, but it is now definitely coming back."

The atrium of the Guggenheim Museum rises more than 50 metres above the heads of the symposium participants – a homage to daylight which is as unique as the outer form of the museum.

BACKGROUND
Throughout its history, VELUX has keenly focused on the optimal use of daylight in all kinds of buildings. This keen interest is naturally linked to the roof windows, a product which the company has developed and refined for more than 60 years. Through the design and production of its windows and accessories, which regulate the inflow of light and control sunlight, as well as initiatives relating to legislation and research in the areas of daylight and indoor environment, the company has continued to express its interest in the use of daylight.

Stimulating an interest in daylight in modern architecture is an important mission for VELUX – not only the daylight that enters through the products. VELUX manufactures – but also daylight in general. From large-scale town planning to the individual building and its space: The VELUX Daylight Symposium and the international award assignment for students of architecture – “the International VELUX Award for Students of Architecture” with the common theme of “Light of Tomorrow” – are some of the most important initiatives in this area.

FACTS
Date: 6–7 May 2007
Place: Guggenheim Museum, Bilbao

PARTICIPANTS
Around 300 (architects, lighting specialists, teachers and others with an interest in the subject) from 24 countries

MODERATORS
James R. Benya, Benya Lighting Design, University of California, USA
Jan Ejhed, Royal Institute of Technology (KTH), Stockholm, Sweden, President of the European Lighting Designers’ Association (ELDA)

SPEAKERS
Dr Richard Hobday, University of the West of England, Bristol, UK
Lisa Heschong, Heschong Mahone Group, USA
Hemma Fasch, Architect, fasch+fasch architects, Vienna, Austria
Ingiborg Schramm, Director Sonderforschungsbereich Lichtgestaltende Ingenieure, Winterthur, Switzerland
Dr Magali Bodart, Postdoctoral Researcher, Lecturer at Université Catholique de Louvain, Belgium
Zack Rogers, Architectural Energy Corporation, Boulder, USA
John Mardaljevic, Institute of Energy and Sustainable Development, De Montfort University, Leicester, UK
Henrik Wann Jensen, Chief Scientist at Luxon and Associate Professor, University of California, San Diego, USA

DISCUSSION FACILITATORS
Steve Snelkowitz, Senior Scientist, Lawrence Berkeley National Laboratory, USA
Marc Fontynont, Professor, Director, Laboratoire Sciences de l’Habitat, Département Génie Civil et Bâtiment, ENTEP, F-Werner Osterhaus, Centre for Building Performance, School of Architecture, Victoria University, Wellington, NZ
Per Olaf Fjeld, Professor at the Oslo School of Architecture and Design, President of the European Association of Architectural Education
Jens Christoffersen, Senior Researcher at the Danish Building Research Institute (Statsbyggeforskningsinstitut – SBI)

For more information: www.thedaylightsite.com
Human beings are rediscovering the sun. Now medical findings in the past five years have repeatedly made clear what unimaginable effects the light from our central star can have on health. Sunlight is just as effective against depression as the most common psychopharmacological drugs – but far fewer side effects. Sunlight accelerates wound healing and suppresses the sense of pain. What is more, sunlight supplies the body with vitamin D. Thus protecting us against cancer, heart diseases and osteoporosis.

But does the rediscovery of the sun also have practical consequences? Richard Hobday, British engineer with many years of experience in solar buildings, is sceptical whether mankind will actually be able to turn these findings into a new sort of architecture and apply in ‘The Light Revolution’ to

learn building anew with the sun, with architects working and think- ing in terms of harnessing the sun rather than excluding it. The ‘Light Revolution’ is about man’s quest to continue in a more holistic, better ventilated and better fit buildings – in a healthful, healthier buildings. His pro- tagonists are a rather different col- lection from those who generally emerge in books concerning archi- tectural history. Inthepho, who was a doctor, high priest of the Egyptian sun cult and building master in a single person, ‘Vitruvius, as whose eminence the correct alignment of subulding into the sun plays just as important a role as formal aspects. George Ber- nard Shaw, the Irish writer, who had a revolving bed built with which he could always follow the position of the sun; and Florence Nightingale, the pioneer of modern nursing, who insisted on having direct sunlight in her wards –

“It is the unexpected result of all my work with the sunlight that their need for sunlight is only exceeded by their need for fresh air.”

Richard Hobday did not call the first chapter of his book ‘Nothing New Under the Sun’ without good reason. The ancient Romans knew the healthful effect of solar radiation and psychopharmacologically stimulating effect of sunlight. This idea was reinforced in psychology by psychopharmacological drugs and antibiotics allowed the positive ef- fects of sunlight on psychological introversion from above the middle of the 20th century – with fateful consequences.

When it comes to the environment, mankind has always had two world views competing with one another. The one sees it as an inexhaustible reservoir of resources, the other as an expli- ited for the benefit of the human race; the other sees it as a highly complex network of biological and physical processes with which man should not interfere too much for his own sake.

Books are the last four decades more and more artists and architects have taken sides for a better environmen- tal balance and defended the century- long policy of exploitation. Two such people introduce this book, which came about during an exhibition in the Canadian Centre of Architecture in Montreal.

The French landscape architect and horticultural engineer Gilles Clément became famous at the beginning of the 90s for his concepts "garden in motion (jardin en mouve- ment)" and "third landscape (troisième paysage)". Instead of trying to pose a strange form from the outside on landscapes, Clément’s landscape architecture understands itself only as a framework, within which the natural diversity of species should be able to unfold optimally. His pro- posed places are the residual areas (spaces that are not used any use- ful purpose) that have temporarily or permanently fallen out of favor, whether protected nature reserves or green spaces gone wild in the mu- nicipal area of our cities.

In his essay for this book, Clément stresses that he “always looks for work but never against nature”, whereas his approach is less philosophical. He analyzes physical phenomena of nature, such as light, temperature and air, and the composition of the air we breathe. This leads him to an understanding of true modernity in architecture by storm. The reasons for such an approach are few and horticultural engineer Gilles Clément became famous at the beginning of the 90s for his concepts "garden in motion (jardin en mouve- ment)" and "third landscape (troisième paysage)"." The French landscape architect and horticultural engineer Gilles Clément became famous at the beginning of the 90s for his concepts "garden in motion (jardin en mouve- ment)" and "third landscape (troisième paysage)". Instead of trying to pose a strange form from the outside on landscapes, Clément’s landscape architecture understands itself only as a framework, within which the natural diversity of species should be able to unfold optimally. His pro- posed places are the residual areas (spaces that are not used any use- ful purpose) that have temporarily or permanently fallen out of favor, whether protected nature reserves or green spaces gone wild in the mu- nicipal area of our cities.

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