

DAYLIGHT & ARCHITECTURE MAGAZINE BY VELUX

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SPRING 2008 ISSUE 08

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VELUX EDITORIAL

IMPRINTS

"Touch the earth lightly" – Aboriginal proverb

What traces, what 'footprint', will our civilisation leave behind in 500, 1,000 or 10,000 years? This question has often been asked by philosophers and other people capable of thinking beyond the limits of their era. Today it is gaining a new significance, as global warming and resource scarcity are putting human society to the test. The way the built environment has been planned - from macro city planning to individual habitable units - has always had a significant influence on human footprints, and architects and planners have historically had important influence on many aspects of human life, from energy use to public health.

Today, a new set of challenges has arisen. How to enable human beings to reduce their ecological footprint? According to the World Wildlife Fund, we are currently over-using the planet's resources as well as its capacity to absorb our waste (including carbon dioxide) by a factor 1.3. Or in their words, we would need 1.3 'Planets Earth' to satisfy our resource hunger. A typical Western European would need as much as three planets – a figure that is still rising.

A turnaround of this trend will not come by itself. Like many other stakeholders, architects, engineers, planners and the building industry are required to take part in the effort to reverse it. It will have to be an effort at all levels, from urban planning to building to product design. This issue of Daylight & Architecture discusses the human ecological footprint from a variety of angles. We take a look at cities and their efforts to become 'greener', we explore how lightness in product design and architecture relates to sustainability, and we describe the joint effort of planners and users to make buildings more resource-efficient. Finally, we take a look at how the WWF initiative One Planet Living – providing places for people to live happily with a reduced ecological footprint – works in practice.

For decades, the Australian architect Glenn Murcutt has demonstrated a committed approach to reducing the footprint of his buildings. Murcutt's designs embody the Aboriginal proverb "touch this earth lightly": a perfect building in Murcutt's sense is the one that leaves no traces behind once it is removed from its site. To achieve this, Murcutt takes into account literally all the external influences on a building, not only the vegetation of the site, its climate and irrigation patterns, daylight and natural ventilation, but also the supply of building materials and energy.

As VELUX is committed to creating better living conditions, and to making buildings more energy efficient, we would like to discuss the themes of sustainability, resource efficiency and low energy consumption. This issue of Daylight&Architecture raises a series of issues that will provide a platform for this discussion.

We wish you a pleasant read of Daylight & Architecture 08.

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NOW

Ross Lovegrove lights up the Viennese nights – with solar energy. Børre Sæthre transports museum visitors on a journey into unfamiliar worlds. Daylight planning made easy with the VELUX Daylight Visualizer. Plus: Topical examples of daylight architecture from Europe and the USA.



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MANKIND
AND ARCHITECTURE
GREEN URBANISM

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Since 2006, over half the world’s population has lived in towns and cities. If this trend continues, the world’s urban centres will need to find a more sustainable system of managing their economies. In this article, Timothy Beatley and Peter Newman explain why ecological urban planning is about more than erecting wind turbines and solar panels. It also entails a complete rethink of traffic planning, establishing fair trade systems and, just as importantly, the visible return of nature to our towns and cities.



PATTERNS
7 × EUROPE

18

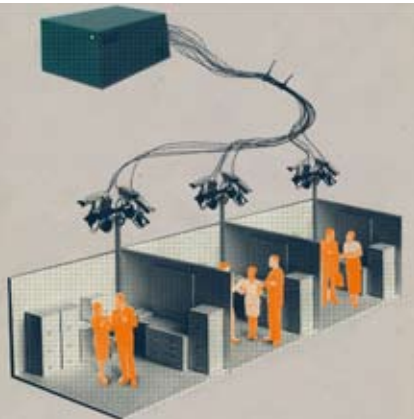
What direction are Europe’s towns and cities moving in, what are their plans for the future? Cia Rinne and Joakim Eskildsen have taken a critical close-up look at urban development in Europe, travelling to seven cities which could not be any more different: From Benidorm, Spain’s “Mediterranean Manhattan” to the former squatter’s colony Christiania in Copenhagen, from the post-socialist brown coal mining city of Gräfenhainichen to a Roma settlement in Hungarian Hevesanyaros.



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70

All according to plan? When it comes to the energy performance of major buildings, this has long since ceased to always be the case. Modern building technology has become too complex, the behaviour of users too idiosyncratic. To really make the most of energy saving potential, buildings also need to be monitored and optimized in everyday use. Norbert Fisch, Stefan Plesser and Thomas Wilken explain how this can be done and what can be discovered along the way.



REFLECTIONS
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Lightweight construction is not just a question of aesthetics, but also of economy and ecology – this was the realization reached some 70 years ago by Buckminster Fuller. In this article, Dutch designer Ed van Hinte talks about the approach taken by modern-day designers and industry to Fuller’s intellectual legacy, and the materials and design forms this involves today.



VELUX DIALOGUE
ONE PLANET LIVING

98

Living a sustainable life in practice using minimal resources – this is the aim embraced by “One Planet Living”, a joint initiative by the World Wildlife Fund for Nature and the BioRegional Foundation. In an interview, Project Leader Sumeet Manchanda highlights his vision of how such a future could work: He believes that a sustainable lifestyle should not be unnecessarily difficult to achieve. And it should engender a sense of satisfaction with life.



VELUX INSIGHT
GLENN MURCUTT:
TOUCHING THE EARTH
LIGHTLY

78

He is hailed as the natural scientist among architects. The Australian Pritzker Prize winner Glenn Murcutt is more familiar with the Australian landscape, climate and vegetation than probably any one else. Based on his deep fund of knowledge, he designs buildings which respect the environment and its often concealed patterns just as much as the living habits and needs of the intended occupants. Francoise Fromonot presents a portrait of the impassioned maverick and takes a look at three of his building designs.



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

TURNING LIGHT INTO ART

When Vienna's Ringstraße was lit up on 8 October 2007 at 11 p.m., it was no ordinary street light illuminating the city. As part of the MAK Design Nite, the Museum of Applied Art (MAK) was unveiling prototypes of what has been named the Solar Tree for the very first time. The solar tree is a lighting feature designed by British industrial designer Ross Lovegrove and produced in cooperation with partner companies Sharp and Artemide. Lovegrove's designs frequently draw their inspiration from forms occurring in nature. The solar tree design embodies this nature-oriented approach, offering a new interpretation of the tree structure with the aim of instilling a sense of nature into the urban landscape. "The Solar Trees communicate more than light," explains the designer, "they commu-

nicate the trust of placing beautifully made, complex natural forms outside for the benefit of all of society. They become a museum that is folded inside out, the museum as an incubator of change in society". The 5.5 metre high installation features a total of 360 of solar cells mounted on its 'branches' and the lighting is switched on and off automatically by a sensor.

If the driving force behind the implementation of this new urban lighting project, MAK Director Peter Noever, has his way, the solar trees will be permanently installed in the future in front of the MAK building and the University of Applied Arts. However, to date it is far from certain as to whether the City of Vienna is ready to adopt such a radical new direction as an alternative method of

street lighting. Lovegrove and his associates view the initial unveiling of the temporary installation in Vienna as the start of a global expansion of their innovative urban lighting concept. And it looks as if they may be right: since 19 November, the design installations have been lighting up the area in front of the Scala in Milan; in January 2008, the prototype was on view at the Parc des Expositions in Paris; and this will be followed by presentations in Tokyo, Los Angeles and Miami.



PHOTO: © GERHARD KOLLER/MAK

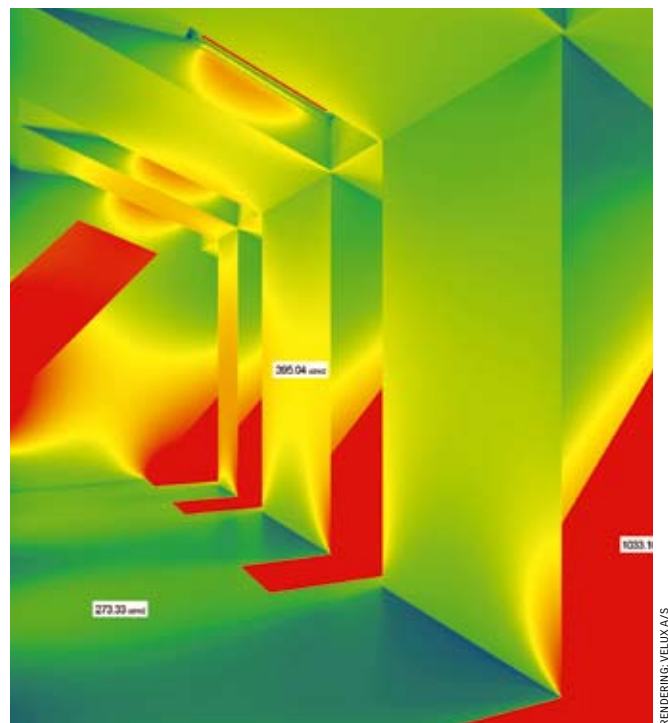
NEWS FROM ANOTHER WORLD

His trademarks are stuffed animals, glistening light and surreal backdrops of sound: The Norwegian installation artist Børre Sæthre immerses his audiences into a world suspended between mystery and space-age design from which hardly anyone emerges untouched. The effect of Sæthre's latest installation 'From someone who nearly died but survived' in Odense in Denmark is no different: It depicts planets on a collision course to the accompaniment of the explosive sounds of the big bang. A white horse emerges into view in a mist-filled glass case, and stuffed ravens stare

at visitors with illuminated eyes. In a sound-deadened room, viewers experience being acoustically cut off from the outside world. As they turn every bend leading through the exhibition, visitors are met by new and confusing impressions on the senses which remain imprinted on the memory. Born in 1967, Sæthre links the symbols of older cultures with motifs taken from science fiction cult films to create a total art work which may at times be amusing, occasionally morbid but always fascinating. The exhibition 'From someone who nearly died but survived' was premiered in 2007 in

Bergen and is now on show until 25 May in the Kunsthalle Brandts (www.brandts.dk) in Odense. For the curator team lead by Lene Burkard, one of the motives for hosting the Sæthre exhibition was to demonstrate commitment to young Scandinavian art: "Over recent years, we have observed the emergence of many good Scandinavian artists, but most of them go abroad to exhibit". 'From someone who nearly died but survived' is the first installation by the artist, who now lives in both New York and Oslo, to be exhibited in Denmark.

PHOTO: TORBEN ESKEROD

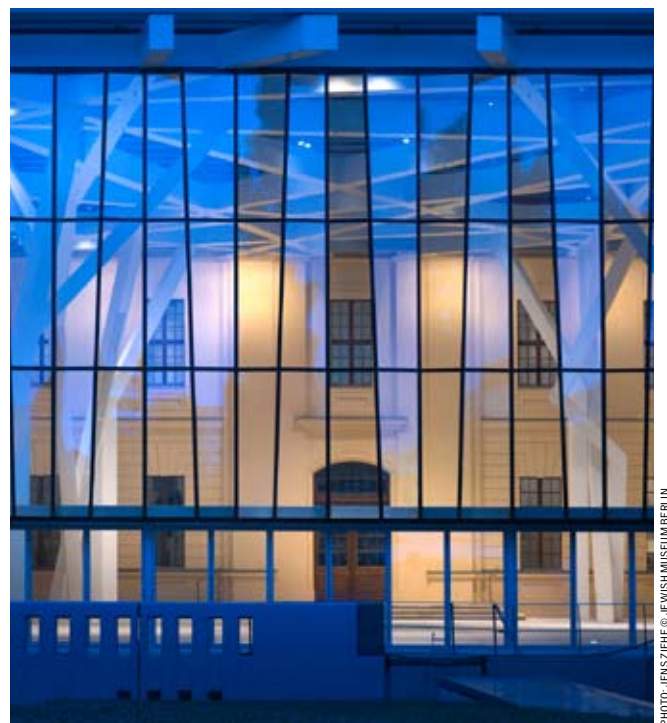


NEW DAYLIGHT PLANNING TOOL

Professional daylight evaluation of buildings and interior spaces is more and more asked for. But it still takes a degree of skill and not a little time to generate the desired result.

An answer to this problem is now at hand in the form of the VELUX Daylight Visualizer, a simple intuitive daylight planning program designed by VELUX in cooperation with the company Luxion. This allows simple room situations to be drawn on the computer in just minutes. These are then photorealistically rendered and statistically evaluated. Daylight animations can also be produced showing the effect of sunlight in the room throughout the day. As VELUX is aiming to offer as many architects, designers and students access to professional daylight planning and rendering as possible, its Daylight Visualizer has been deliberately designed for maximum operating simplicity. The user first specifies the basic room geometry, choosing the roof shape, size and position of windows and doors, and internal room surfaces. The next step involves determining the orientation and geographical location of the building, as well as the sky conditions, date and time for the simulation. The program

uses this information to calculate the daylight conditions in the room. This can be depicted in the form of photorealistic images, for which both luminance and illuminance data can be visualized in the form of false colour and iso-contour images. In this way, the program permits important key variables such as the daylight factor to be calculated. The VELUX Daylight Visualizer runs under the Microsoft Windows XP operating system and can be downloaded free of charge from <http://viz.velux.com>. The site includes a number of tutorials and examples on what the application can do.



SUKKAH IN STEEL

Daniel Libeskind, architect of the Jewish Museum in Berlin, is renowned for the symbolic character of his architecture. The existing museum building, opened in 2001, provided an intriguing example of this symbolism in pattern of its facade, whose lines point towards locations relating to Jewish culture in Berlin, and by its inner courtyards know as the 'voids', intended to embody the devastation suffered at the hands of the Holocaust. Libeskind's latest structure in Berlin, the canopy covering the inner courtyard of the Jewish Museum, also echoes symbolic references. Supported by four free-standing bundles of steel pillars, their asymmetrical 'roof branches' were inspired by the concept of the Jewish sukkahs, the name given to the temporary constructions that sheltered the Jewish people returning from exile in Egypt and that are remembered each year at Sukkot, the Feast of Tabernacles.

The glass courtyard is enclosed on three sides by the original museum building constructed in 1735 by Philipp Gerlach. The four supporting bundles cover a surface area of 670 square metres and are 13 metres in height. Plans exist to use the courtyard from now on as an events

area for gatherings of up to 500 people. The ground floor now also houses new technology and storage rooms. Using a total of 340 tons of steel, the white supporting and roof structure is solid rather than filigree in design, and indeed Libeskind's architecture is known for assigning a secondary role to factors of efficiency and economical use of materials. But still, museum director W. Michael Blumenthal is confident that "Berlin has become the richer by the addition of this architectural attraction, which is certain to draw Berlin residents as well as tourists. The fascination of the glass courtyard is its complexity and the intriguing way in which it uses light." This is influenced to a large degree by the courtyard's facade, a concertina-style construction made of glass encompassing no fewer than nine different panel formats. And to satisfy the demands of conservationists, who had called for the greatest possible degree of transparency for the glass courtyard, an extremely clear type of white glass was selected with an internal coating to provide protection from the sun. This has created a space flooded by light with a varying pattern of reflections and shading depending on weather conditions.



GLASS WAVE

For some weeks now, Sir Norman Foster's graceful glass canopy over the inner courtyard of Washington's Smithsonian Institute has added a new dimension to the art and cultural scene of the city. The inner courtyard links the American Art Museum with the National Portrait Gallery, which is accommodated in various wings of the erstwhile Patent Office. The building itself is among one of the USA's most significant examples of neoclassical 'Greek revival' architecture, and consequently architects Foster and Partners and engineers Buro Happold were under a strict mandate to leave the existing building substance unscathed.

The undulating steel and glass construction is mounted on eight aluminium-clad supporting pillars along the sides of the courtyard. Only a thin seam links the new roof with the historic building, lending the illusion that the lightweight glass structure is hovering above the stone of the building facade. The wave-like structure of the canopy was the response conceived by the architects to the height offset between the existing building volumes. The outside edge of the glass canopy curves almost imperceptibly upwards to form

a gutter. The rainwater is drained away via the eight supporting pillars. Each of the 862 glass panes is individually shaped and provided with its own integral sun guard. Seen from directly underneath, the steel and glass structure appears completely level. It is only from an inclined perspective that the wave shape becomes evident. In sunshine, the shadows cast by the steel latticework play on the facades of the historic building, while on dull days the greyness of the sky is made to appear remote.

By roofing over the inner courtyard, an indoor public space of around 2,600 square metres was created between the two museums, which can now be used throughout the year irrespective of weather conditions for concerts, lectures or other cultural events. An ingenious sound and light system accommodated in plain pillars long the edges of the building creates the required atmosphere. The inner courtyard was designed in co-operation with landscape architect Kathryn Gustafson. High ficus trees in giant flower pots made of marble and a water basin make this a cheerful and serene public space.



OLAFUR ELIASSON IN THE MOMA

He uses ice crystals and wafts of mist, glass mirrors and metal gratings, candles and the sun itself as tools to communicate light as a phenomenon of nature. His sources of inspiration vary from mathematical formulae to the moss that grows on the highlands of Iceland. And he has become established as a sought-after partner and associate for architects. This is Olafur Eliasson, the multi-talented light and installation artist from Copenhagen, born in 1967. For the second time since 2001, he is being afforded an honour reserved to only the most revered names from the world of contemporary art. Until 30 June, the New York Museum of Modern Art is dedicating a special exhibition to Eliasson's work. Part of the exhibition will be held in the MoMA itself, and part of it in the P.S.1 Contemporary Art Center in New York. In total there will be 34 works on show reflecting the variety of Eliasson's artistic output since 1991. The exhibits will include photographs, light and mirror objects and the Moss Wall dating back to 1994, an installation made of living reindeer moss which visitors to the exhibition in the halls of the MoMA can watch growing – or depending on

how it is tended, drying out. Added to this are six brand new works commissioned specially for the exhibition: the installation 'Take Your Time', which has lent its name to the exhibition and which comprises a large spherical mirror on the ceiling of the room that is set in rotation to create an irritant room experience for the observer. 'The natural light setup' is a light box that simulates the natural spectrum of sunlight by artificial means. In 'Mirror door', on show in four variations, Eliasson combines spotlights and mirrored doors to create moving light spots on the floor of the gallery.

The 'Take Your Time' exhibition is due to move on to pastures new in the autumn; initially to the Dallas Museum of Art and later to the Museum of Contemporary Art in Sydney. The summer of 2008 will also see Olafur Eliasson present his 'New York City Waterfalls', a temporary art project staged in public spaces that will entail setting up artificial waterfalls at four waterfront locations in New York. For more information, go to www.nycwaterfalls.org

D

DISCOURSE

BY
MICHAEL
MEHAFFY

Michael Mehaffy is an urban planning consultant, author, educator, and research associate with Christopher Alexander's Centre for Environmental Structure – Europe. He is Chair of the USA chapter of the International Network for Traditional Building, Architecture and Urbanism, an NGO working to preserve and build on local patterns around the world. He lectures, publishes and teaches internationally.



PHOTO: TRAVELPIX LTD./THE IMAGE BANK/GETTY IMAGES

Patterns of city life

It has been just over thirty years now since Christopher Alexander and his team published *A Pattern Language*, the best-selling architectural book that set off unexpected waves in other fields – notably computer science, where useful by-products include Wikipedia, The Sims and other familiar software. In so doing, it proved its functionalist merit and surprised some sceptics who objected to its apparently traditional aesthetic surface. But underneath was a transcendent functionalism that aimed at capturing a deeper architecture of objects in process and their recurring spatial relationships. Its aesthetics was not just expressive material for art but the emergent result of deeper structural processes – including social ones.

The theory of patterns holds that configurations in our environments (or in our software) often repeat under similar circumstances, and that it is possible to map these repeating patterns into a relational system of overlapping groups. In this way the linear combinations of the elements of design can be developed into more tightly interlinked networks of wholes. Using such a language, designers can build up rich poetic connections between things, just as natural languages can move beyond mere recitations of facts into the complexities of

poetry. So, too, it now appears, traditional builders used something like this kind of language to make the surprisingly complex structures we all admire in historic cities and towns.

This turns out to be a handy fact for today's urbanists. Critics (and even some prominent architects) increasingly bemoan the failure of today's fragmented projects to form coherent wholes at the scale of urbanism. But it is becoming clear that sustainable cities will require just this kind of integrated urbanism – affording us the ability to move efficiently between daily activities, to find interest and pleasure in a walkable streetscape, to participate in shaping an evolving, liveable neighbourhood that is responsive to our needs and our actions.

While a number of investigators continue to develop the fertile topic of patterns, Alexander and colleagues are now exploring the ways living processes use coded sequences to evolve and differentiate adaptive form. We want to know how we can use these insights to make a more adaptive, more sustainable kind of technology – one that has the ecological qualities of living systems. We hope such crossover work may again point the way to surprising new possibilities.

GREEN URBANISM: YESTERDAY, TODAY AND TOMORROW...



PHOTO: AKG-IMAGES/ERIC LLESSING

By Tim Beatley and Peter Newman

The fate of our planet will most likely be decided in the cities. Only if they become sustainable, will we manage to provide decent living conditions to all mankind. 'Green Urbanism', as it is often dubbed, certainly has a future. To assert itself, however, it will have to overcome many of the planning and consumption patterns that have come into existence since the beginning of industrialisation.

THE EARLIEST RECORDS of cities, dating back some 8,000 years, show that the building of cities paralleled the development of writing. There seemed to be two major functions to this writing:

1. To codify the regulations governing the city, i.e. town planning
2. To lay down the stories, told for millennia, about their reason for existing, where they have come from and how they face the future, i.e. urban spirituality.

The fact that town planning and urban spirituality have a long history should not surprise us. Some reflection on their significance can provide us with a framework for how we should now face our future in cities that contain more than half the human race and which now require a new kind of green urbanism.

WHY IS TOWN PLANNING IMPORTANT?

Cities are about commerce and opportunity. Through food surpluses they provide us with the division of labour that can enable many more economic and cultural activities than in a hunter-gatherer society. These activities have always needed to be ordered within a common rational framework – without them, commercial and human activities cannot work.

Homo sapiens existed for around 3 million years as a hunter-gatherer before discovering that their knowledge of seeds and animal husbandry could allow them to settle and produce significantly more food in the one place. With their new-found skills and the ensuing cooperative division of labour, humans became more functional and towns grew from such settlements.

But with many people living together, the new knowledge of urban opportunity faced immediate challenges:

- How to ensure water and food were distributed evenly
- How to remove waste so that it did not pollute the water and it helped to grow the food
- How to provide housing for all
- How to ensure people were safe and secure
- How to build streets and public spaces so that everyone could access the city and meet together
- How to tax and govern once the scale of a city has grown beyond families and groups where everyone is known.

Left Right up to the present day, the Tower of Babel (shown here in the painting by Pieter Bruegel d. Ä., 1563) is a symbol of human delusions of grandeur and feasibility. There is a lot to say in favour of the theory that Babylon's fall in the ancient world was also due to the excessive use of natural resources.

These are the issues of town planning which existed then and still stretch us in every fibre of our urban existence. In the end they require a set of regulations that we all agree on as forming the basis for our common good.

Today we must add a new issue: how do we reduce the consumption of resources and subsequent ecological footprint whilst improving the quality of life? This is the fundamental question of urban sustainability and whilst it needs to find its way into all elements of town planning regulations, it is also fundamentally a question of urban spirituality.

WHY IS URBAN SPIRITUALITY IMPORTANT?

In order to create order and co-operation, human beings have always found a higher order of explanation. Thus the earliest writing not only codified the regulations for how we should live our lives in cities but also provided some of the whys and wherefores.

The oldest texts of the Bible, common to Jew, Christian and Muslim, tell of a world being created from chaos into a beautiful natural order. Human beings lived within this natural order and tended the garden as hunter-gatherers did (and to a vanishing amount still do). Then, as the story goes, despite being warned, they chose to 'eat of the knowledge of the tree of good and evil' and were banished from the garden forever, to till the earth and build cities.

The story reflects the transition to cities that human beings chose to make – to follow the opportunities and new knowledge that come from urban existence – and that we continue to choose today. Nobody returns to the existence of the hunter-gatherer. However, the endless stories of the ancient texts all show that humans in cities must not only take advantage of the new opportunities, they must contribute to the life and functioning of the city.

The earliest writings about cities show that this new existence could not be presumed. The ancient city of Babylon was castigated by the prophets because it not only enslaved people but it destroyed the surrounding trees. Its end came as the silting of the Euphrates River ruined its agricultural base. Ephesus was the last major European city to be abandoned (in 1000 AD) when its port silted up due for similar reasons.

Thus choices must be made in our cities and their conse-

Was the downfall of New Orleans in 2005 a direct consequence of global warming? Doubt still exists, but the parallels between climatic change and increasing damage due to storms is undisputed.

Bottom Highways in Los Angeles. Up to the age of 25, the average US citizen has spent altogether one year of his life sitting in a car.

Opposite Allotments in the city (here in Dortmund) became popular in the 20th Century particularly as recreational places in the countryside. They will become more important in the future for sustainable urban development, because they help to guarantee the local supply of fruit and vegetables.



quences accepted. The ancient texts show a constant battle as some cities learned to live and thrive within their constraints, while some did not accept their constraints, did not adapt their behaviour, and simply collapsed. In his book *Collapse*, Jared Diamond has documented examples of both these processes.

The future of cities today involves similar choices. The planet cannot continue to absorb the greenhouse gases emitted primarily from our cities. The climate will destroy our cities, just as it swept over New Orleans, if we do not adapt to a new common good established as a global system. Even sooner, we face the peaking in world oil production and the reality that we cannot continue to build cities that require more and more car travel, to reach houses that require more and more goods to be stored in them.

The first signs of how we can adapt our cities to be more sustainable are appearing. We know enough from the demonstrations of green buildings and green suburbs that it is possible to live with a fraction of the resource consumption we have been used to, and that the urban experience is healthier, with more daylight and less pollution. But we can also see that the urban hubris which sees little need to change is universally evident. Some cities are likely to decline rapidly as they refuse to acknowledge the new constraints. Hopefully, enough cities will move quickly so that we can continue the ancient experience and create new town planning regulations and new urban spirituality stories about the transition to sustainability.

THE CHALLENGE OF GREEN URBANISM

While modern cities in the developed world are healthier and more desirable places to live than counterparts a century or two ago, there are still serious challenges to confront. Modern cities require an extensive flow of resources and exert a tremendous impact on planetary ecosystems. The City of New York alone requires more than 1 billion gallons of water a day. Its electricity consumption is immense, amounting to more than 50 million megawatt hours per year currently and expected to rise to 72 million by 2030. In turn, New York City emits almost 60 million metric tons of carbon dioxide, a quantity larger than some nations. That said, cities offer the most hope





Greenness in the city is good for the microclimate – and for the image. The US real estate investor Donald Trump already recognized this in 1983. The Trump Tower in New York was an early forerunner of 'green multi-story buildings', which became the sensation from the mid 90's onwards.

for accommodating population growth and advancing quality of life, while advancing (perhaps achieving?) sustainability and protecting planetary health.

As British writer and activist Herbert Girardet rightly asserts, there will be no sustainable future without sustainable cities. The prospects of a sustainable life in the city can already be seen in the efficiency and performance of cities like New York. While per capita carbon dioxide emissions for residents of the US are more than 24 metric tons, an average New York City resident emits only about 7. Even more ecologically efficient and sustainable levels of living can be seen in European cities, but the point is that compact and dense urban environments that permit and allow walking, bicycling, and public transit, for instance, are important antidotes to profligate, wasteful and ultimately unsustainable global patterns of development and resource use.

The good news is that cities have emerged as important players in the sustainability movement in themselves. There is now much interest in sustainable cities, to the extent that there is even good-natured competition to see which city can be the greenest. In the U.S., more than 600 local governments have now signed the Mayors Climate Action Agreement, committing them to meeting or exceeding the Kyoto targets. And the nation's largest cities are now leading the way and showing tremendous leadership, laying out ambitious green goals. Mayor Richard Daley of Chicago has famously declared that his city will be the greenest in the nation. And in the spring of 2007, Mayor Michael Bloomberg released an ambitious green plan for New York City, declaring the intention to make that city the "first ecologically sustainable city of the 21st Century."

Green Urbanism in its fullest meaning refers to those ways in which the agendas of cities and urbanism, and those of environment and conservation and sustainability, can and do profoundly overlap. It certainly includes much of the following: building and growing more densely and compactly; creating walkable mixed use urban environments that permit and encourage walking and bicycling; investments in public transit; creating closed-loop urban metabolism and local production of goods and materials (food, building, materials); and investment in and commitment to sustainable and renewable energy technologies integrated into the built form (e.g. solar,

wind, biomass) as well as solar design that uses all the best of modern materials like steel and glass to enable daylight to fill our buildings, instead of needing artificial light and heat..

Nevertheless, cities will continue to exert serious material and resource demands on the planet and how to shift this in more sustainable directions will be a major challenge.

Understanding in a more systematic way the nature and magnitude of the resource flows required of a city is a first step, and more cities and regions will need to do this. London is an example of one city that has. *The study City Limits: A Resource Flow and Ecological Footprint Analysis of Great London*, completed in 2002, yields a comprehensive picture of the flows and resource demands of this metro region of about 8 million. Among its key findings: Londoners consume 154,400 GW of energy yearly, producing 41 million tons of CO₂; Londoners require almost 50 million tons of materials (including building materials and food) and generate 26 million tons of waste. Overall, the ecological footprint associated with these resource demands is almost 300 times the land area of greater London. Most of its critical inputs, such as food and energy, are imported and derived from unsustainable, non-renewable sources.

This material flow analysis has shaped planning and policy in the region to a considerable degree. The so-called London Plan, for instance, contains a section entitled "London's Metabolism: using and managing natural resources." In this cross-cutting policies section, such topics as household waste recycling and composting targets are set, as well as targets for reuse of construction and demolition waste (most construction aggregate needed for London, comes from outside the city, so opportunities for reuse are especially promising), improving air quality, and water supply and reuse. London's energy plan and, most recently, its Climate Change Action Plan, set ambitious targets for generating energy from local and regional renewable sources and for the reduction of greenhouse gas emissions. Under the Energy Plan, by 2009 each of the City's 34 boroughs should be home to at least one zero-energy development (like BedZED), boroughs should identify sites for renewable energy production, and the city should, by 2010, produce 665 GWh of energy from some 40,000 renewable energy schemes. A new regional food strategy similarly

PHOTO: ARTVERTISE

Above Solar cells (shown here on a roof in Chicago) are amongst the most important mainstays for a decentralized supply of renewable energy in the future. One square meter of solar cells helps to save approximately 100 litres of oil per year.

Below Building towers in Dubai: The metropolis in the Persian Gulf currently has more than 200 multi-storied buildings which are over 100 meters in height. The term 'sustainability' has only just begun to take effect very gradually in the town planning of the region – and when it does then mostly in individual cases and for image reasons.

sets up more local production and processing (shortening supply lines) and from more sustainable means.

Finding the elements of a sustainable material system for cities around the world will be a challenge. It will begin with a better and more systematic understanding of the inputs and outputs, something similar to what London has undertaken. Beyond that, a sustainable urban metabolism will require a localising of material sources (for instance, growing much of the food a city needs closer to home). It will also require the city to become carbon-neutral and energy balanced, producing from renewable technologies integrated into the built form, at least as much energy as residents need. And more power should come from solar and other renewable sources to carry out the clean-up and restoration needed in many of these cities.

And a more concerted effort will be necessary to forge systems of exchange and market relationships that at once profoundly reduce the environmental impacts of urban consumption and provide a fair and equitable return to producers wherever they are. Globalised trade will be replaced by fair trade – as urban consumers acknowledge more accountability for the impacts of their urban consumption. Unfettered and unquestioned globalism or globalisation, by which capital seeks the least expensive inputs and labour, regardless of ecological impacts or working conditions, will be replaced by a kind of 'glocalism' that seeks both to shorten urban supply lines and to bring about environmental stewardship and human development in sources, regions and countries.

DESIGNING CITIES FOR RESILIENCE

However, the path to a sustainable, solar future will mean a bumpy ride, however. Cities will face more uncertainties and calamities and potential shocks of many kinds in the decades to come and will need to be profoundly more resilient than they currently are. Even if global emissions of greenhouse gases are substantially and swiftly curtailed, the effects of climate change will manifest themselves and be especially severe for cities. These impacts range from heat waves and drought to extreme storms and rise in sea level.

Few cities have faced up to the global decline in oil production and supply (peak oil) that makes even more pressing the need to reduce carbon in our cities. Those cities that are



PHOTO: TIM BEATLEY



PHOTO: EMILY / FOTOLIA.COM

less sprawling, have more extensive and better developed transit systems and have nurtured local and regional food production, will have an easier time adapting to a world of diminished oil supply, and will also be more able to create a healthier and more positive quality of life for residents.

Cities will increasingly need to be designed and managed for resilience; both resilience in the face of physical (but predictable and expectable) hazards and natural forces, such as earthquakes and flooding, and the new economic and resource shocks that are now just as predictable. But we remain mostly in denial about their imminent impact.

Green cities of the future will need to re-commit to being cities of people first, cars second as Jan Gehl has shown in Copenhagen, Melbourne and now New York with his programmes to reclaim the city for the pedestrian. Reducing commitment to the private automobile will make cities more resilient in the face of declining oil and open up opportunities for more space for nature to re-assert itself. Restoring urban forests and nature help to reduce cooling and other energy demands further enhancing the energy resilience of a city. And especially true in the cities of the South, investments in urban greening, whether community gardens and city farms, community solar production, or water and energy conservation, have the potential to lighten the burden of poverty and enhance the quality of living for all.

Cities have historically been seen as the antithesis of nature, intrinsically unnatural and destructive. A major challenge will be in imagining new cities, and new city forms, that acknowledge the intrinsic, innate need for humans to have direct contact with nature and with the other forms of life with which we share the planet – what E. O. Wilson has called *biophilia*.

There are a host of creative tools and strategies that could be employed to help re-earth urban populations. All future building must be green, also in the sense that nature becomes a central part of the urban design programme. Many examples exist now, from the airport terminal in Jakarta, which incorporates a rain forest in its centre, to the green rooftop on Chicago's city hall (which has set in motion a renaissance of green rooftops, numbering now more than 250 in the city). Many cities have committed to ambitious targets for tree-planting – Los Angeles and New York City have each declared an inten-

tion of planting a million new trees in each of these cities. Efforts are underway in some cities to daylight streams running through urban neighbourhoods, restoring the rhythms and sounds of water, and to restore urban hydrologies and watersheds. For many years, Zurich has had a programme for bringing urban streams back to the surface, and cities as diverse as Cape Town, Sydney and San Francisco have made rediscovering their waterfronts and riverfronts and reconnecting to them a high priority.

Cities offer the hope and potential to bring us together, to civilize us, to provide immense cultural value; but they must also afford the chance to experience *wildness*, and this is perhaps no easy task.

One of the boldest moves at re-earthing can be seen in Seoul, South Korea, where the Cheonggyecheon river has been restored and returned to the surface, dismantling an elevated freeway in the process, and giving residents of downtown a new green amenity. In turn, the Cheonggyecheon has served as a catalyst for other impressive green projects in the city, including its newly opened Seoul Forest, a park that has included the planting of 400,000 trees. Economic analyses of such projects demonstrate the merits of such green city efforts, even using narrow economic criteria. And leaders in cities like Chicago and London recognise that global competitiveness will require urban sustainability and green urbanism. Diminishing resources (such as oil), the need to tackle climate change and resource depletion, and the challenge of enhancing quality of life and direct contact with nature, all argue for a new paradigm of global urbanism.

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PATTERNS

Urban planning and urban reality:
A journey through Europe in seven stages.

7 × EUROPE

What role models do Europe's cities offer? How do they plan for their own future? What does the term 'sustainability' mean for them?

Photography by Joakim Eskildsen /
www.joakimeskildsen.com
Introductions and questions by Jakob Schoof
Answers by Cia Rinne

This article focuses mainly on invisible things. Or, at least, on things that are not immediately apparent at first glance. For sustainable urban development is not just a matter of solar panels, fuel cells and better insulation. It is above all a matter of a greater density of buildings, of concepts for transportation and supply, of ownership structures and political decision making. As the American architect Douglas Farr wrote, "It is no longer acceptable to build a high [energy] performance building in a greenfield, automobile-dependent context and have it certified as 'green'."¹ He continues, "The time for half measures has passed. [These sustainability achievements] are optimising the components of a dead-end, automobile-dependent or resource squandering pattern of development. [...]"². The cities of our time show why the term 'holistic' is more than just a vogue expression. Persons wishing to comprehend and even plan cities must be able to deal with complexity. Since about two years ago, more people in the world live in an urban environment than in rural areas. But urbanisation is not a new phenomenon. In Great Britain, the urban population had outstripped the rural population by 1851, and in most other European countries this had taken place by 1900 at the latest. Europe thus has long had the opportunity of testing sustainability strategies in its cities. In fact, it might be thought that the cities have a duty to be advisors and role models for sustainable urbanisation to formerly

developing countries. However, one should be sceptical about whether they would be capable of performing such a knowledge transfer – and whether the recipients of their well meant counsel would even want to hear them. It seems instead to be the case that every country is destined to undergo – at different periods in time – the same experiences with industrialisation and urbanisation. Thus, the German urban planner Jürgen Frauenfeld commented, "Shanghai has undergone explosive growth in the last decade. Now the euphoria has evaporated and the city is attempting to cope with the ecological and social consequences of this growth."

Can European cities still offer a role model and were they, indeed, ever role models? Are they even a model at all or is that merely a chimera? We will be asking seven questions of seven European cities which could not be more different. Our choice ranges from Benidorm, the Spanish 'Manhattan on the Mediterranean', to the former squatters' colony Christiania in Copenhagen and from the car-friendly 'new town' Milton Keynes to the post-socialist, post-industrial Gräfenhainichen, which is currently reinventing itself as a 'city with new energy'. What is it that distinguishes these cities from one another, what unites them? What was the original purpose of founding these cities, what are the visions for the future which now spur them on?

What all seven cities have in common is that they were only founded in the sec-

ond half of the 20th century. Or they experienced momentous upheavals during this period which had a decisive impact on their cityscape. They are all, therefore, relatively young cities. Nevertheless, newer developments are already beginning to be superimposed over the initial historical layers and paradigm shifts in planning are starting to show results: thus, car-friendly Milton Keynes is currently attempting a redensification of its expansive layout. And Almere, a city on a polder designed from scratch, has now, with the help of internationally acclaimed architects, given itself an urban centre. Christiania, for decades a state within a state that recognised no private ownership of land, is currently under pressure from politicians and – in their wake – from real estate investors. They have cast a covetous eye on this green oasis located in one of the most expensive residential areas in Europe. The question as to where all these developments will go remains exciting.

1. Douglas Farr: Sustainable Urbanism, John Wiley & Sons 2007, p. 41
2. Ibid., p. 41



City visions yesterday and today

Cities do not develop by chance. Their foundation is always a volitional and purposive act. For medieval townspeople their town was not merely an amalgam of buildings, streets and squares but also a piece of parchment: the town charter. In the town charter, the sovereign confirmed the special privileges accorded a settlement and the privileges formed the basis for the economic and social development of individuals. Our image of what city is – a medium for culture – can thus be directly traced back to medieval towns and their burghers.

Medieval cities defined themselves primarily through their fortified boundaries: here is the town, there is the surrounding countryside. Today, the contrast between town and country has almost disappeared. "Everywhere is the city: We still conceive of cities as discrete objects, separate from their surroundings. That's no longer true. There is no exterior to the global city that connects and sustains us all."³ This situation demands new visions from those who would found new cities. The most compelling visions (even if they may not always be the most convincing ones) can be divided into two groups: those that flatly reject the concept of an unbounded city – and those that resolutely implement the concept. With its regular network of thoroughfares, Milton Keynes, for example, bears all the hallmarks of a planned urban sprawl. Theoretically there are no limits to the expansion of the system. 40 years after its foundation, the 'new town' of Milton Keynes is more popular with its residents than ever: they appreciate the fact that the town does not prioritise automobiles but has also left room for cyclists and pedestrians. And they enjoy the contacts between neighbours within clearly delimited neighbourhoods that are completely accessible on foot.

It is not least economic factors that determine the acceptability of urban visions. For decades, Benidorm, for example, has embraced the laws of the free market. Its aim of making the greatest profit out of every metre of coastline is manifest in the extension of buildings and of the town skywards. The skyline created in this man-

ner has become one of Benidorm's most characteristic features and is one of the instruments of its city marketing. The erstwhile fishing village's dream of prosperity through tourism has come to fruition. Benidorm's success has attracted imitators who are gradually expanding the urban sprawl into the hinterland of the town with the creation of new urban settlements and holiday villages. Christiania is a complete contrast: for years the population of this free state was limited to around 850 people; new buildings were strictly prohibited. This was mainly for political and ecological reasons, but was also rooted in the self-organisation concept of the settlement: property held in common and grassroots democracy require complicated decision-making processes, which can only be managed with a limited and committed population.

Citizens come to power: The participative city

That the inhabitants of a city should be actively involved in decisions on the city's future is not as self-evident as it may appear to us today. Most urban utopias show little consideration for individuals and their wish for co-determination. As Ruth Eaton wrote in her book 'The Ideal City', "in the designs of creators of utopias the collective must at all events always take priority. [...] Diversity of opinion and tolerance, which constitute the essence of a democracy, are foreign to many utopian societies".⁴

So it comes as no surprise that many of the utopian urban visions have never moved off the drawing board. Many of them are based on the total control of living conditions by a central authority. As the Swiss urban planner Carl Fingerhuth commented dryly, "It is hubristic of modern man to believe that cities can be comprehensively controlled. While it was possible to put a man on the moon, cities have always managed to evade control."⁵

Fingerhuth offers the picture of an itinerant swarm of bees, which decides on a new location without any contribution by its queen and only by virtue of its collective intelligence. "It is not a linear process; it is based on the com-

plex collaboration of many bees, whose respective enthusiasm for a particular location allows various factors to be weighed up against each other."⁶ The parallels to contemporary cities are obvious: "Sustainable cities need active involvement of the people; they need active citizens [...] Local government needs to be more than modernized; it needs to be transformed into a vibrant dynamic and challenging forum of debate."⁷

In Europe, the 'Local Agenda 21' was a case in point on just how difficult it can be to translate plans into action. The Agenda was an attempt to take the sustainability goals of the UN summit in Rio de Janeiro 1992 and implement them at a local level. But it was rare for a popular movement to ensue at local levels. It became clear that the majority of people were simply not prepared to be actively involved in sustainability.

Many cities drew the following lessons from this experience: sustainability must comply with the laws of the market. It must be able to 'sell' itself, must be capable of being passively consumed by individuals and require very little involvement or dedication. Financial incentives are usually much more effective than appeals to people's ecological consciousness.

To whom does a city belong?

Imagine a city where there are no properly certified property rights. Is that unimaginable? But that is the order of the day in most metropolises in developing countries:

The Peruvian economist Hernando de Soto has calculated that 92 percent of the population in Egypt and 80 percent of all Mexicans do not hold a legal title to any property. He added: "Nobody's ever washed a rented car. [...] So, yes, the moment you own something you care more for it. But I'm also saying that, beyond ownership, being within a comprehensive property system makes possible a series of things that were not possible before. [...] Macroeconomics is simply unsustainable over time unless you also have the micro: property networks and capital-creating systems that underpin it and make even the poorest participate in the social contract that it rests on."⁸



De Soto's hymn to private property does not mean that common property would be superfluous. But it does need efficient management and a clear assignment of competences. Otherwise it will be menaced by what the microbiologist Garrett Hardin described in 1968 as the 'Tragedy of the Commons': if a property held in common is used more extensively than would allow it to regenerate itself over the same period, this will result in a gradual degradation and even complete collapse. The problem is: in order to maintain the viability of common land, all users must be prepared to limit their claims on the common good. If an individual refuses to do so he will profit in the short term – and the community will bear the costs in the longer term. Thus the willingness to scale back individual interests is correspondingly low when the issue affects goods held in common.

Living in the city – with whom?

Cities attract settlers and retain residents because they offer opportunities for employment, for meeting and being with people, for becoming someone different. As migrants to every slum will affirm, they are there because they want to be," the environmentalist Kai N. Lee wrote.⁹

Cities create a unique combination of extremes: anonymity and propinquity, a division of labour and cohesion, a market society and a civic society, individuality and close social cooperation.¹⁰ They can and do unite a wide range of lifestyles, religious persuasions and social classes. This is what distinguishes them from village communities, "where everybody knows each other, the most important needs can be satisfied within the village itself, and the village square is the place where consensus and cooperation are negotiated".¹¹

This capacity for integration is increasingly being put to the test in growing metropolises – and may even collapse completely in some areas. Despite being dependent on one another, many wish to have nothing to do with each other: "while elites need people willing to work for low wages, they do not want them living nearby."¹²



While the public authorities talk almost unanimously of a 'socially balanced mix' as a requirement of neighbourhood planning, real estate investors prefer to speak of exclusiveness. Luxury yields profits; the affluent classes of society are courted by the private sector. The state and its social security net are expected to look after all the rest. But the German futurologist Horst W. Opaschowski increasingly sees obligations for private investors – if only out of self-interest: "The property sector and housing companies will in future also have to offer social management [...] Such social housing management will act as a social glue and include such things as care for the elderly, debt counselling for rent arrears, occupational projects, mutual aid associations, local exchange trading schemes, and the like. [...] In an age of shareholder value, social housing management may also offer economic benefits: [...] profitability through social responsibility!"¹³

Quality needs community

Can quality of living be measured quantitatively? The company Mercer Human Resource Consulting certainly believes it can. It publishes an annual league table of cities with the highest (and lowest) quality of living. Their criteria range from the crime rate and the amount of personal freedom to educational institutions and cultural activities; they include public transport, public access to green spaces and, of course, the range of facilities available in neighbourhoods.

Particularly in socially disadvantaged areas, the importance of social and cultural activities in addition to a functioning infrastructure has been demonstrated: in the 1990s, Rio de Janeiro began extensively redeveloping many of its slums. It quickly became clear that the people living there required more than roads, electricity and running water. A well designed kindergarten, a culture centre with interesting programmes and a pleasant park allowed even the inhabitants of a favela to be proud of their neighbourhood.

Urban life depends – in addition to a healthy social mix – on such public utilisations. "Urban space has always been a place for the community rather than the individual [...]. They provide

emotional attraction, embodying political and cultural activities [...]. They link the past, present and future, become reassuringly familiar to local people and stimulating for visitors", Mary Mellor from Sustainable Cities Research Institute in Newcastle wrote.¹⁴

The sustainability question: How much is enough?

Environmental and energy experts say that every sustainable development must take three criteria into consideration: efficiency, sufficiency and consistency. Efficiency means obtaining an equivalent result with fewer resources. Sufficiency means: how much growth is necessary? When do I have 'enough' of something to be able to live? Consistency means the compatibility of technologies and commodities with natural cycles. This also covers, among other things, the capacity of products to be recycled.

In our civilisation there is a long tradition that the returns from improvements in efficiency are more than compensated for by growth. We live in houses whose insulation is continually improving while the houses themselves become ever bigger. We travel over longer and longer distances in increasingly heavy cars that are driven by ever more fuel-efficient engines. We enjoy the exchange of data over the internet – and forget that the World Wide Web and its infrastructure are already consuming as much energy as global air traffic.

Douglas Farr has therefore postulated that in future, energy consumption should no longer be measured per square metre of floor space but rather in residential buildings per occupant, in office buildings per employee and in airports per passenger. Only then would densely built up cities finally be accorded the respect they deserve: closely built up settlements may indeed consume many more resources per square metre than areas with single family detached houses; however their consumption figures per inhabitant are demonstrably lower.

Inhabitants of densely populated areas drive less and use less energy for heating. And, by the by, they also live more healthily and are less likely



to be obese.¹⁵ On the other hand, in many areas of the world living in densely populated areas is not very popular. People want to live 'at ground level', have direct access to green spaces and require a high degree of privacy. These are all demands that have, for many decades, spurred the growth of residential estates with single family houses. Fulfilling these demands even in densely populated cities is one of the most important challenges of future planning.

The addiction of people to their automobiles has proved to be the greatest barrier to sustainability. The German futurologist Horst Opaschowski described the motivations behind the mobility of modern man as somewhere "between flight and locomotion". "No matter how comfortable the home and apartment, no matter how pleasant the quality of life of the neighbourhood and the attractiveness of the city, the urge to get out and get away remains as strong as before."¹⁶ On the other hand, in Central Europe around half of all car journeys are shorter than five kilometres, one third of them are even shorter than three kilometres. Most of them could be easily carried out by bicycle. And it would be quicker too: scientists have found that for distances up to 4.6 kilometres the bicycle is the most time-saving alternative.

To wean people from their cars it will be necessary to create bicycle lanes and footpaths together with public transport networks. And: they will need to be close meshed, well kept, inexpensive and safe. But will this in itself be enough? "Psychologically, relinquishing one's car [...] almost amounts to an amputation of a person's feeling of self worth", Horst Opaschowski wrote. "The process of cutting the cord is much too difficult and painful to allow the close attachment to the automobile to be abandoned. The importance of automobiles for people's mobility may, at best, experience some qualification in future. But at present, cars cannot be replaced yet [...]"¹⁷

A future for the cities

Around the year 2000, mankind experienced the transition to a new era that went almost completely unnoticed. For the first time, popula-

tion growth had slowed worldwide. This means: the global population is growing increasingly slowly and is expected to level off by the year 2100 at between 11 and 12 billion people.¹⁸ The growth of cities is expected to move in the opposite direction: individual cities will continue to grow, others will stagnate or shrink. This will have consequences for city planning. According to the German city planner Philipp Oswalt, "the result will be a surplus of room, of buildings and premises that are no longer required. Despite this progressive decrease in utilisation, the shrinking cities will continue to expand, will grow on their outskirts, thus doubly thinning out: fewer activities will be carried out over larger areas".¹⁹ Oswalt considers the planning of shrinking cities to be essentially "reactive because, in contrast to growth periods, it has no appreciable effect on important forces – such as deindustrialisation, demographic change or even suburbanisation."

The Swiss city planner Carl Fingerhuth compared this planning strategy with a game of dominoes in contrast to traditional urban development that resembles a puzzle: a puzzle is a tightly controlled experimental game. There is only one correct solution, a predetermined picture. It is different in a game of dominoes: the picture is never 'finished'; it can always be resumed at any point by clever additions to the whole.

This should be kept in mind when attempting the social and ecological remodelling of our cities. In other words: we must all learn to play dominoes. "The adaptability of the city is unquestioned. It is the adaptability of its citizens, decision-makers and urban policy within that city that will be put to the test in the pursuit of sustainability."²⁰ Future sustainable redevelopment of cities will still have to draw on a combination of education, investments in infrastructure, financial incentives and, sometimes, rigid regulations. This will require – as in a game of dominoes – a capacity to improvise. But urban planning must finally also learn the lessons of its own past. It is curious how perfunctorily and even reluctantly the energy efficiency and the patterns of use in buildings and settlements have been analysed to date. For decades archi-



tecs and planners have proposed hypotheses and only very rarely verified them. Just imagine: if the natural sciences had proceeded in the same way, today we would have neither artificial fertilisers nor the relativity theory nor manned space travel.

Notes

3. Bruce Mau / Institute without Boundaries: Massive Change. Phaidon Verlag 2004, p. 45
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6. Ibid.
7. Bob Giddins et al. in: Future Forms and Design for Sustainable Cities, Architectural Press 2005, p. 28
8. Hernando de Soto in: Bruce Mau and the Institute without Boundaries: Massive Change. Phaidon Verlag 2004, p. 41
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10. Dr. Matthias Schulze Böing: Soziale Stadt, s. eundc.de/pdf/49002.pdf
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12. Bob Giddins et al. in: Future Forms and Design for Sustainable Cities, Architectural Press 2005, p. 22
13. Horst W. Opaschowski: Besser leben – schöner wohnen? Bundeszentrale für politische Bildung, 2005, p. 67
14. Bob Giddins et al. in: Future Forms and Design for Sustainable Cities, Architectural Press 2005, p. 15
15. Vgl. Douglas Farr, Sustainable Urbanism. p. 19
16. Opaschowski: Besser leben – schöner wohnen? Bundeszentrale für politische Bildung 2005, p. 112
17. Ibid., p. 119
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7 × EUROPE

- 01 ALMERE
- 02 GRÄFENHAINICHEN
- 03 HEVESARANYOS
- 04 MILTON KEYNES
- 05 SOLAR CITY, LINZ
- 06 BENIDORM
- 07 CHRISTIANIA

01	ALMERE NL	Facts
Planners		Location Flevoland, NL
Dirk Frieling, Teun Koolhaas, Sjeef Scheek. Office for Metropolitan Architecture, Rotterdam (Master Plan for the city centre, 1994)		Founded 1984 (as an official municipality)
		Start of construction 1975
		Site 130.5 km ²
		Inhabitants 181,960
		Population density 1395 inhabitants/km ²
		
	QUICKBIRD © DIGITALGLOBE 2008; DISTRIBUTED BY EURIMAGE	
	52°32'47"N 5°32'26"E	
<p><i>P. 28/29</i> The new centre of Almere has not yet been completed. A collage of spectacular architecture which shuns neither unusual shapes and colours nor unconventional materials has been created.</p> <p><i>P. 30</i> The function of some of the high-rise buildings in the new centre is somewhat opaque. Along the Weerwater lake, luxurious residential blocks were created and form an interesting contrast to the narrow brick terraced houses only a stone's throw away.</p> <p><i>P. 31</i> The town is consistently divided into a business centre and various residential areas. Great importance is placed on privacy. Many houses in the first residential area built in Almere are now hidden behind tall hedges.</p>		

<div>VISION:</div> <div>What vision is the city founded upon, and what does this vision encompass?</div> <div> <p>Almere, Holland's largest community planned entirely from the drawing board, was founded in the seventies on the Flevoland polder that had newly been reclaimed from the Zuiderzee. The city was planned first and foremost to ease the pressure of population overcrowding in Amsterdam and Utrecht. It was designed as a spacious, polynuclear, sprawling garden city as epitomised by Ebenezer Howard.</p> <p>The city that evolved out of nothing became a bare canvas for experimentation by architects who saw the project as a chance to test out their ideas. There was no overall plan. The city grew up step by step, following frequently changing guiding principles. Initially, traditional Dutch residential districts with dykes grew up, followed by suburbs that followed the American model, envisaging a life surrounded by nature but still close to urban facilities. During the initial years, the main aim was to make detached one-family homes affordable, providing all residents with their own access, garden and parking space in a village-type atmosphere (or what was considered to be such). With growing affluence, house designs later became more individual.</p> </div>	<div> <p>cars, bicycles and pedestrians were now layered vertically one above the other in the city centre: road traffic is routed underneath a raised platform reserved to pedestrians, and below that are all the city's parking spaces. Pedestrians only touch ground level again as the raised platform gives onto a large free space accommodating the new theatre located directly alongside and over the water.</p> <p>The new city centre may help Almere rise above its satellite role. A new urban development plan drawn up in 2003 optimistically envisages a population of 400,000 by 2030.</p> </div>
<div>FUNDING/OWNERSHIP</div> <div>Who owns the city, and how is it financed?</div> <div> <p>Many of the new houses constructed in Almere are owner occupied.</p> </div>	
<div>SOCIAL STRUCTURE:</div> <div>Who lives here, who doesn't, and what networks exist among the residents?</div> <div> <p>Originally Almere was populated by members of the middle classes escaping from less desirable living conditions in Amsterdam to an area where owning their own home was an affordable option. There are a large number of double income families living here, and more recently the new city has drawn its overwhelmingly young population, around one third of which is of foreign origin, from other regions of Holland. Despite this, the majority of the population is still largely oriented towards Amsterdam, where they either work or cultivate social contacts. Consequently Almere has been stigmatised as something of a 'dormitory town' where there is not much else to do.</p> </div>	<div> <p>The individual districts, which grew up at different times in different architectural styles, encompass a colourful mixture of different forms of living. Alongside uniform rows of terraces there are individually designed detached family homes, experimental residential blocks and futuristic residential towers on the water's edge, as well as plenty of green spaces. But real urban living of the type one might expect to encounter in a town of this scale is missing. "Despite its size, Almere is illustrative of the uncomfortable fact that a simple accumulation of buildings does not create a city," is the fitting comment of Rita Capezzuto. An even stranger phenomenon is that this residential sprawl that appears to stretch without common goal or plan over the laboriously reclaimed land, does not even communicate a coherent suburban feel. But still the population senses something akin to the stress of living in a big city. "It is a big city," explains one woman who lives and works in Almere, "and it has the same big city problems as Amsterdam, although on a smaller scale."</p> <p>The traffic within the city is largely separated, with passenger cars, buses, pedestrians and cyclists each assigned their own tracks or routes, and buses are given right of way in the city. Due to the employment situation – the city has around three times more residents than it has jobs – the Almere community has no alternative but to commute, which clogs both the motorways and the rail connection to Amsterdam to the limits of its capacity in peak rush-hour periods.</p> <p>A sizeable concentration of people is only encountered in Almere's shopping centre and pedestrian zones, department stores and restaurant chains. Otherwise there is very little pedestrian movement in the city. Only sporadic passers-by walking dogs or out with children are seen in the parks or on the waterside. "That's how it is here," explains one father out with his children in the playground, "people sit at home or get in their cars when they want to go somewhere."</p> </div>
<div>DEVELOPMENT:</div> <div>Is the vision still alive? Who keeps it alive, and how?</div> <div> <p>Over 30 years after its foundation, Almere is still one of the most rapidly growing cities in Holland. When a population threshold of 100,000 was reached in the nineties, a move was launched to counteract the negative image of Almere as a 'dormitory town' and a suburb of Amsterdam, with plans to create a new profile for the city through the construction of an urban centre. The contest to come up with a master plan for the city was won by the Rem Koolhaas Office for Metropolitan Architecture (OMA), which broke with the existing tradition of low-rise residential sprawl to extend the centre by a creating a business park at the station and a number of spectacular high-rise buildings with shopping malls, offices and apartments facing the harbour. What had been horizontally arranged transport routes for</p> </div>	<div> <p>cars, bicycles and pedestrians were now layered vertically one above the other in the city centre: road traffic is routed underneath a raised platform reserved to pedestrians, and below that are all the city's parking spaces. Pedestrians only touch ground level again as the raised platform gives onto a large free space accommodating the new theatre located directly alongside and over the water.</p> <p>The new city centre may help Almere rise above its satellite role. A new urban development plan drawn up in 2003 optimistically envisages a population of 400,000 by 2030.</p> </div>

<div>SUSTAINABILITY:</div> <div>What can be said about the resource consciousness of the city – and about its environmental footprint?</div> <div> <p>Although one of the objectives of the new structural plan for Almere drawn up in 2003 is to strive towards a 'greener' infrastructure and establish a waste recycling system, to date the city has failed to produce any landmark achievements in terms of environmental policy. The sprawling structure of the city makes doing without the car anything but easy for the inhabitants. In contrast to the cities located further north, which border directly onto the sensitive landscape zones, Almere is surrounded by agricultural land, making urban expansion less problematic – if only in geographical terms – than in other parts of the region.</p> </div>	<div>FUTURE PROSPECTS:</div> <div>What will happen to the city in the future?</div> <div> <p>The plan is for Almere to expand further, growing out to the west across the water towards Amsterdam. However, if the present policy of urban sprawl is permitted to continue, there is a real fear that the building land will not be sufficient to accommodate the targeted 400,000 residents. At the same time, the infrastructure will have to be further developed and new jobs created, as the intention is not only to reduce Almere's suburban character but also relieve the existing regular congestion of transport routes between Almere and Amsterdam. Even if the planned road-building program goes ahead, the soil properties and water supply situation of Flevoland place grave doubts on the sense of pursuing further building development on the reclaimed region. At least ten per cent of the land area needs to be reserved for fresh water storage. The southern section of Flevoland is also below sea level, resulting in damage both to plants and building fabric due to high water levels during the winter months, while water shortages during the summer leave the surface water salty, causing road, dyke and building subsidence. The rising sea level anticipated as a result of climate change will do little to alleviate these problems.</p> </div>
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Planners

ARGE Neue Energie, Dr. Harald Kegler, Jörg Janicke, Brigitte Walther, Gräfenhainichen, Germany ("Stadt mit neuer Energie" ("Town with new energy"), urban development concept 2004)



51°43'43"N
12°27'17"E

P. 34 Gräfenhainichen is one of the so-called shrinking towns of East Germany. Since the reunification, it has lost around one third of its inhabitants and there is a disproportionately large number of older people in the community.

P. 35 Even Dr. Jäger, one of the brains behind the urban development concept of ARGE Neue Energie, said: "It is all only a start". Some single-family houses have had solar collectors installed which are mainly used for heating water.

P. 36/37 Several concrete-slab buildings in the centre of Gräfenhainichen have already been torn down. As part of the "Stadtumbau Ost" (urban conversion east) program, the unpopular upper floors of the concrete-slab buildings are having their innards removed and taken away.

P. 38/39 The Golpa-Nord brown-coal factory in Gräfenhainichen existed up to 1991 and used to employ a considerable number of the local inhabitants. Today, this is the location of the Ferropolis, which is simultaneously a mining museum and a place to hold events.

Facts

Location	near Wittenberg in Saxony – Anhalt, on the edge of the Dübener Heide
Founded	before 1254
Area	41.63 km²
Population	7948
Population density	191 inhabitants/km²

02 GRÄFENHAINICHEN

VISION:

What vision is the city founded upon, and what does this vision encompass?

Lignite mining meant that Gräfenhainichen, originally a country town, grew into a sizable industrial centre in the GDR period. Old village structures were among the victims of the growing coal industry: the inhabitants of the nearby village of Gremmin were summarily moved out in 1964 to make way for lignite extraction. Gremmin had disappeared completely by 1977, while multi-storey slab-construction blocks went up in the centre of Gräfenhainichen to house the large numbers of opencast mineworkers. After the collapse of communism and three decades of raw coal output, the opencast mine was closed and gradually flooded. Now there is a lake called the Gremminer See on the site of the former village of Gremmin and the opencast mine that replaced it.

Gräfenhainchen has now set itself the target of abandoning its reliance on fossil fuels by 2020 and becoming self-sufficient in energy, mainly from solar and geothermal sources. This is intended to give the environment, damaged by decades of opencast mining, the chance to regenerate itself. Using renewable energy is also intended to create jobs, which will help to counter the decline in population. At present gas and oil are the principal energy sources, but the first pilot projects for energy-efficient building, outlined in the 2004 urban development concept draft, are already complete. For example, two new buildings in Ackerstrasse, occupied mainly by opencast mining pensioners, use only geothermal and solar energy. "We pay about two thirds less for our energy," one satisfied resident is able to report, "the energy comes from the sun and out of the ground."

DEVELOPMENT:

Is the "vision" still alive? Who keeps it alive, and how?

Mayor Harry Rüspelt has set himself the task of restructuring Gräfenhainichen as a 'solar garden city'. In 2003, Gräfenhainichen successfully submitted its 'city with new energy' project for inclusion in the 'Urban Development 2010' International Building Exhibition. It has since established contacts with model towns

In West Germany and Austria, convened an energy advisory board and created a local government post to include both experts and the public in the redevelopment process. The 'Wärme- und Energiegesellschaft mbH' (Heat and Energy Company; WEG) was set up specially to work on the redevelopment process.

FUNDING/OWNERSHIP

Who owns the city, and how is it financed?

The initiatives that are already in place were either funded by the individual housing associations or supported by the state. For example, the Gräfenhainicher Wohnungsgesellschaft mbH built the low-energy buildings in Ackerstrasse, while several detached houses like the ones in the Am Barbarasee housing park have acquired state-subsided solar installations in recent years. This equipment is used mainly to supply hot water, as systems meeting all the energy needs represent a considerable investment for many people.

SOCIAL STRUCTURE:

Who lives here, who doesn't, and what networks exist among the residents?

A large percentage of the population lost their jobs when lignite mining was phased out. The population of Gräfenhainichen has declined by roughly one third of the original figure since the collapse of communism, and is also aging rapidly. "We used to have a lot of children here, but then scarcely any births were registered. Today there are only three children's day-care centres in Gräfenhainichen," a kindergarten teacher tells us. Most young people move to larger town or other parts of Germany with their parents, or at the latest when they leave school. David, who lives in a slab-construction block in Gartenstrasse, does not intend to stay in Gräfenhainichen either. "My friends are all in Wittenberg. I'm off too, as soon as I've finished school."

LIVING CONDITIONS:

How do the inhabitants live – and what determines their living conditions?

Several of the town's slab construction blocks were demolished as part of the Stadtumbau Ost (Urban Re-development Plan East) programme which is trying to solve the problem of housing standing empty in East Germany, and goes hand in hand with ecological urban development in Gräfenhainichen. At the last count, about half the slab-construction blocks in Gräfenhainichen were no longer needed. In the buildings that are still occupied, the upper floors are particularly unpopular, as there are no lifts. So construction workers are demolishing the fourth and fifth floors in several slab constructions in the neighbourhood. The plan is to retain the lower-rise apartment blocks and increase population density in areas of the city that have already been developed.

SUSTAINABILITY:

What can be said about the resource consciousness of the city – and about its environmental footprint?

Alongside some pilot projects, such as the low-energy buildings in Ackerstrasse and solar plants in various places, Gräfenhainichen has also changed its energy supply sources. The city has disconnected itself from the wasteful municipal heating connection with the former Zschornwitz power station site and attached itself instead to a neighbourhood heating system, though this is still conventionally powered with natural gas. As well as this, plans also include a solar power station in Ferropolis, the 'Iron City' on the other side of the Gremminer See. In the meantime, a kind of open-air museum has developed there, featuring worn-out rotary and bucket excavators from the lignite mining days that act as a backdrop for various events.

But Dr. Jäger, one of the minds behind the New Energy group urban development concept, stresses that developments are still at the planning stage. "This is all just a start," he states, "there's not a great deal to be seen yet."

FUTURE PROSPECTS:

What will happen to the city in the future?

In the long term, Gräfenhainichen is planning to use not just solar energy, but geothermal energy and thermal energy from groundwater, wind power, biomass and hydrogen. Those involved are working on the assumption that the north-south facing houses in Gräfenhainichen old town and its geographical situation offer good conditions for efficient use of renewable energy. One challenge to be met will be keeping the population figures stable and reversing the decline by creating new jobs. It is remarkable that Gräfenhainichen is sticking to its concept of ecologically sustainable urban development despite its financial problems and dwindling population.







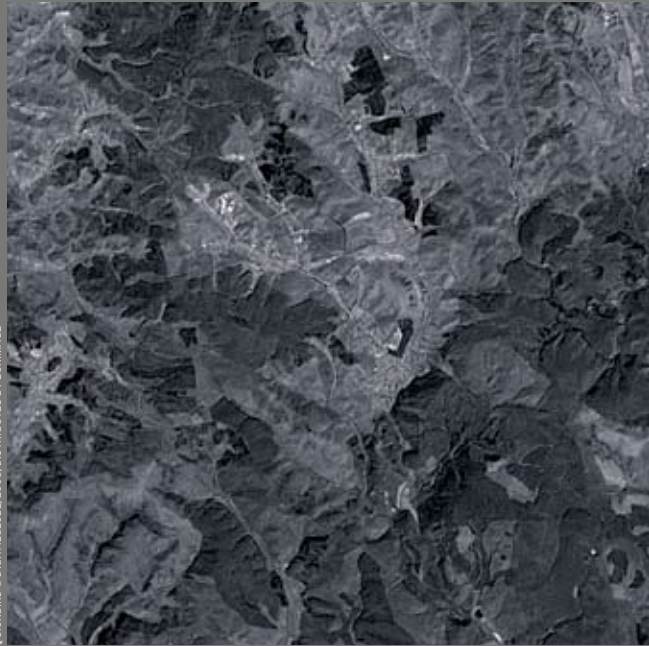
Planners

The local authority and the occupants themselves



Facts

Situation	approx. 20 km north-west of Eger in north-east Hungary
Founded	c. 1945
Area	0.1 km ²
Population	approx. 120
Population density	600/km ²



48°00'29"N
20°14'08"E

P. 42 Outside the village of Hevesaranyos, there is a settlement on a slope which is almost entirely populated by Roma. The inhabitants collect their water in buckets from two water pumps, produce hardly any waste and consume little electricity.

P. 43 In the Winter, wood which has been collected over time is used for heating in cast-iron stoves. In the Summer, when it becomes too hot in their modest homes, the inhabitants carry their stoves into the yard and cook outside.

P. 44 The inhabitants do seasonal work – they pluck rose-hips, sloes or fruit and, if it rains, they gather snails. Some households cultivate the earth on a small scale.

P. 45 The few cars in the settlement are only rarely used. Anyone wanting to go into the village walks or rides a bike. The next town can be reached by bus, which stops at the foot of the settlement.

VISION:

What vision is the city founded upon, and what does this vision encompass?

After the Second World War, a small group of previously nomadic Romany people settled in Heveseranyos in north-east Hungary. For centuries previously, they had been subject to enforced settlement measures. But these often failed, as the Romany people could not find any existing basis for their existence and were thus compelled to travel off again in order to survive. Hungarian law required local authorities to house and care for Romany communities, but they were usually allotted sites in unattractive locations because of resistance from the local people and lack of accommodation. This meant that numbers of Romany settlements came into being on the outskirts of villages or, as in the case of the settlement at Heveseranyos, some distance from the place itself and linked with it only by a road.

As Magda Karolyné reports, the Hevesaranyos Roma community lived in tents in the village at first, before the local authority allotted each family a building plot on the slope outside the village. Here two roads were built: first of all the narrower Viola út, which is built like a terrace on the slope, and a little later the somewhat wider Ibolya út, which runs uphill from the main Eger-Hevesaranyos road. Each family was allowed to build a house. Most of the houses in Viola út are smaller and built of clay, as they were built first, while in Ibolya út rather more spacious brick structures were erected.

DEVELOPMENT:

Is the "vision" still alive? Who keeps it alive, and how?

The Romany people of Hevesaranyos, who had traditionally worked as basket-weavers and musicians, were mainly employed in the surrounded kolkhozes under communism, but lost their jobs when the system collapsed. As their hand-made baskets were increasingly less in demand, many of them have since then taken temporary jobs in agriculture, factories or kitchens.

Even though several families who were able to afford it have moved into the village in recent years, the Romany settlement still exists and is growing up the slope. Young families are building houses at the top end of the village, so that Ibolya út is now lined with houses almost up to the crown of the hill.

3. FUNDING/OWNERSHIP

Who owns the city, and how is it financed?

The houses are owner-occupied, and they sell them to each other.

SOCIAL STRUCTURE:

Who lives here, who doesn't, and what networks exist among the residents?

The Hevesaranyos Romany people are almost exclusively Hungarian; most of them were born and bred here. Others have married into the village or moved here from neighbouring communities. Most of the inhabitants do seasonal work, have jobs in Hevesaranyos itself or are hired by local farmers.

It is rare for a non-Romany to come up into the settlement; mail is the only common cause of a visit. Children walk to the kindergarten or to school in Hevesaranyos each day but the older inhabitants use the village mainly for shopping, for work or to go to church on Sunday.

Some families actually live in the village, but nevertheless visit the settlement on a regular basis. One of these is Suzsanna, who prefers village life to life in the settlement. "It is quieter here and things are more orderly. There's almost always something going on in the settlement, and that's fine, but I like to be able to detach myself from it as well."

LIVING CONDITIONS:

How do the inhabitants live – and what determines their living conditions?

Everyone in the settlement, young or old, knows and says hello to everyone else. "I moved here a few years ago because I have family and friends; here who are very important to me," says Maria, a young woman. "I feel at home here, and it's more peaceful than in town." The accommodation is modest, offers very few comforts and much of everyday life is acted out in the street. Children play there, and the older inhabitants sit together on benches or ledges on walls to chat to each other. Magda, an older woman, has spent almost all her life in the settlement. "I am at home here, and there's something for me to do every day. I get bored when I visit my daughter in the next village, where none of the people are Romanies. They just sit in front of the television; there isn't a soul in the street."

SUSTAINABILITY:

What can be said about the resource consciousness of the city – and about its environmental footprint?

The Roma community's way of life is ecologically sound, more from necessity than environmental awareness. Only a tiny percentage of the families has a car. Anyone who wants to get to the next village or to Eger takes the bus that runs from the country road below the settlement. There is no running water in the settlement. As all the water has to be pumped up by the inhabitants themselves and carried home in buckets, it is used very sparingly. If a bath is needed, the water has to be heated up on the cast-iron wood-burning stoves that are still used for cooking food and to heat the houses in winter. Electricity is used mainly for lighting and for radio and television, and consumption is correspondingly low. Rubbish is not collected from the Romany settlement - in fact surprisingly little accumulates. A lot of it is burned in stoves or fed to animals. The settlement nestles in a green, hilly landscape with a wealth of wild plants that some of the residents collect and put to good use. A lot of furniture is bought second-hand, swapped with neighbours and renovated.

FUTURE PROSPECTS:

What will happen to the city in the future?

No drastic changes are expected in the near future, but some Romany people are now better educated and will be able to afford bigger houses, so a gradual improvement in housing standards can be expected. It is still not known if and when the Romany settlement will be connected to the mains water supply or the municipal sewerage system.







52°02'39"N
0°41'58"W

P. 48 Milton Keynes has been characterised as a "homage to the car", among other things. All the districts of the city are surrounded by multiple-lane roads which cause considerable noise, whereas pedestrians and cyclists are consigned to bridges and subways.


P. 49 Originally, no house was to be higher than the tallest tree. Although this resolution has now finally been broken, at least in the city centre, Milton Keynes is still regarded as a model of planned landscape settlement with its spread-out buildings and lack of underground parking places.

P. 50 The market in the centre is directly in front of the huge shopping centre and is one of the few lively elements in the city. The many stands and small shops were not part of the stringent plan.

P. 51 It is difficult to live here without a car, as most of the inhabitants have now found out. Public transport is inadequate, the distances are large and so people prefer to use the car, which is parked directly in front of the house.





05	SOLAR CITY, LINZ AU	Facts	
Planners		Location	Linz-Pichling, Upper Austria
Prof. Roland Rainer, Vienna, Austria Herzog + Partner, Munich, Germany READ group (Thomas Herzog, Norman Foster, Richard Rogers, Norbert Kaiser)		Foundation	1994
		Start of construction	1999
		Area	32 ha
		Population	approx. 3,000
		Population density	9,375 inhabitants/km²
			
		48°14'29"N 14°22'13"E	
<p><i>P. 54</i> The new city district is especially popular with families that have children. There are hardly any cars in the area and there are lots of places to play between the houses.</p>		<p><i>P. 55</i> The plans also encompassed the green areas, which were created with earth from nearby Lake Weikerl and elsewhere. They are all laid out differently and are so popular with the inhabitants that the biotope located behind them, with all its rare animals, remain mostly untouched.</p>	
		<p><i>P. 56</i> The new estate is easy to find one's way around in. The centre at Lunaplatz with all the necessary facilities can be reached easily by foot from everywhere.</p>	
		<p><i>P. 57</i> Cars are not necessarily a part of the image of Solar City. Private traffic is diverted underground and the tram takes the inhabitants into the city center of Linz in half an hour.</p>	

VISION:
What vision is the city founded upon, and what does this vision encompass?

At the beginning of the nineties, although jobs were available in the Upper Austrian provincial capital of Linz, there were not enough houses and apartments for the some 12,000 people looking for homes. The main demand was for rented apartments. Under Mayor Franz Dobusch, the Linz city government initially commissioned urban planner Roland Rainer to plan an urban expansion in the suburb of Pichling, situated in an area of natural beauty that was otherwise in danger of becoming an industrial estate. The area was seen as a development zone where up to 25,000 people would be able to live.

To take full account of the eco-development of the area, the city – previously better-known primarily as an industrial location – consulted Munich architect Thomas Herzog.

Together with the Linz Director of Construction, Franz-Xaver Goldner, he presented the idea of a 'Solar City' for the first time. To a large extent, the new housing estate must do without the use of fossil energy sources and be designed on economically sustainable principles. The city created must be largely car-free, a compact city of short travelling distances, with passive and active use of solar energy and an environmentally-friendly wastewater disposal system. Ultimately, the centre of the Solar City, with 750 apartments and part of the infrastructure, was designed by Herzog and his READ (Renewable Energies Architectures and Design) group colleagues, Norman Foster, Richard Rogers and energy technology planner Norbert Kaiser. As well as high architectural demands, these buildings also had to meet the criteria of low-energy construction and lowest possible level of environmental pollution.

DEVELOPMENT:
Is the vision still alive? Who keeps it alive, and how?

The first part of the Solar City was recently completed years, with due regard to the eco-criteria. Twelve property companies and 19 architects, each of whom designed in a different style, created the residential buildings, which are grouped in a radial-concentric arrangement around the centre of the Solar City. The city

centre was designed by Auer + Weber, winners of an architecture competition, and is easily accessible by foot from all houses and apartments. Roland Rainer's original master plan always envisaged that Linz-Pichling must not just become a dormitory town. So special importance was attached to the development of public amenities and good transport links. In addition, Reinhard Gutmann and Ulla Schreiber joined the planning team as experts in socio-cultural overall planning and woman-friendly housing respectively. Not only was the new district provided with a centre with shopping facilities, but also a school with crèche, a kindergarten and a parkland area. Added to this, a new tram route was opened in 2005, linking the centre of the Solar City to Linz in just half an hour. In theory at least, this made the use of private cars – which mainly run and park underground in Solar City – unnecessary.

FUNDING/OWNERSHIP
Who owns the city, and how is it financed?

Solar City was supported by both the Province of Upper Austria and the EU (APAS fund for renewable energy). In addition, five of the houses designed to low-energy standards by Martin Treberspurg were supported by the Federal Ministry of Transport, Innovation and Technology. Although the city was able to acquire the land for the housing estate at a reasonable price, the planning costs were considerable and Solar City would definitely not have been realised in such high quality without the development funds.

SOCIAL STRUCTURE:
Who lives here, who doesn't, and what networks exist among the residents?

The residents of Solar City Linz are mainly families with children plus a scattering of older people, but very few middle-aged people. Children still play on the playgrounds between the newly-built houses, even late in the evening. Natascha, a mother-of-three who has lived in Solar City for two years, just cannot imagine moving away again and is full of praise for the children-friendly planning. "The children are always outdoors. They have lots of friends and can walk to school."

Most of the people who live in

Solar City work in Linz and usually orientate themselves towards Linz too, whereas in Solar City they only use the most essential shops and facilities in the centre, as well as the Volkshaus (community hall) on Lunaplatz, which accommodates such facilities as a municipal library, an adult education centre and a senior citizen's club.

LIVING CONDITIONS:
How do the inhabitants live – and what determines their living conditions?

One resident compares life in Solar City with life in a small village. "You know the neighbours, you can walk everywhere and bathe in the lake in the summer." It seems as though the idea of a largely car-free city where the public amenities and local public transport must be accessible by foot, and so made more attractive, has been successful. What car traffic there is immediately diverted underground and held in underground car parks. As Natascha reports, it is very easy for parents to take their children to the kindergarten on foot before taking the tram to work. In keeping with the well-prepared concept of solar construction, the apartments themselves are aligned to make optimal use of daylight, and adequate spacing between houses means that they are still bright, even in the winter months. Every apartment has access to a balcony, a roof terrace, a garden or conservator.

Almost the whole of Solar City is surrounded by an undulating park that was built with the material excavated when extending the Kleiner Weikerlsee Lake. As well as the generous green areas between the houses, and the many playgrounds, the nearby Traun-Auen and Weikerlsee recreation areas are also very popular with local residents, especially in the summer.

SUSTAINABILITY:
What can be said about the resource-consciousness of the city – and about its environmental footprint?

The objective of low environmental pollution was pursued consistently in the planning of Solar City, and was not simply restricted to the use of solar energy but also included wastewater disposal, transport and the countryside bordering on the housing estate.

Apart from solar cell arrays and good thermal insulation, the solar architecture, which was geared towards low fossil energy usage, also included special planning of the buildings and apartments. In Solar City, there are extremely narrow houses with single apartments that are sun-drenched all day. Five of the residential homes designed by Martin Treberspurg use no conventional heating whatsoever. Roughly half of the housing estate's hot water requirement is met by solar thermal energy – this is more than originally planned. The balance of the useful heat reaches the housing estate via a well-insulated district heating system.

The 106 apartments and school designed by Michael Loudon are completely wastewater-free and so have no wastewater connection. Wastewater is disposed of in a separate system: urine is recycled as biomanure, whereas the grey water is filtered and separated into compostable solid materials and low-nutrient liquid, which is ultimately discharged into the nearby stream. Solar City's environment-friendly concept also includes sustainable planning of the surrounding countryside. The park surrounding the housing estate was laid out so attractively by Atelier Dreiseitl that only a few residents of the estate visit the biotope that lies beyond. So a natural habitat for rare and endangered animals and plants has remained preserved in the immediate vicinity of the housing estate.

FUTURE PROSPECTS:
What will happen to the city in the future?

The aim is to extend Solar City even further. Space is available for this, mainly towards Ebelsberg and Linz. Expansion would certainly benefit the infrastructure too, which up to now has always suffered from a shortage of customers. Some of the shops in the centre of Solar City have already had to close and are now standing empty. Only the shops for everyday requirements, such as food shops, the bakery and a few coffeehouses have survived. It is safe to assume that the planning of the further extension of the housing estate will also stay true to the concept of low environmental pollution, and will be carried out in small but meaningful steps.





Planners

Francisco Muñoz, Pedro Bigador et al.



38°32'13"N
0°07'45"W

P. 60 In the 1950s, Benidorm was still a small town, which mainly lived from the fishing industry. Today, it is a destination for mass tourism and has one of the greatest housing densities in the world.

P. 61 Even in Winter, the city is visited by a great many tourists. Especially Spanish pensioners like to take a holiday here during the cold part of the year.

Benidorm is efficient when it comes to housing seasonal guests or using space and energy. In the view of many experts, the densely populated city is a lasting alternative to

the settlement of Spain's Mediterranean coastline as a result of tourism.

P. 62 The people of Benidorm spend most of their day outside their apartments. The streets are lively and, away from the hotels with their roof terraces and pools, a cross-section of perfectly normal city life can be found.

P. 63 The same beach and the same view for everyone: The residential blocks and skyscrapers were intended to create equality among the inhabitants according to the will of the city planners.

VISION:

What vision is the city founded upon, and what does this vision encompass?

Benidorm in the fifties was just a little town whose inhabitants had made a living from fishing for centuries, but within a very short time it developed into a tourist destination famous mainly for its skyscrapers. After the town became accessible by road from Alicante and the rest of Spain from 1914, it opened up first of all to tourists from Madrid. The first hotels were built in the twenties. When Spain lost its South American colonies it also lost its income from deep-sea fishing. For this reason the Almadra fishery in Racó de l'Oix in Benidorm had to close – along with numerous other small fisheries. This put paid to a key factor in the regional economy. Many families were faced with financial ruin and the population of Benidorm went down rapidly. In this situation, tourism, which Spain had opened up to again after its economic and diplomatic isolation in the '40s, represented a welcome alternative source of income.

In 1954 the local authority, under its young mayor Pedro Zaragoza Orts, presented a new urban development plan proposing, above all, that the town should expand with family houses and small hotels – repeating structures that were already in place. Benidorm started to switch from fishing and agriculture to the tourism sector. Finally, in 1956 a general plan (Plan General de Ordenación) came into force: this provided for intensive urbanisation in Benidorm and was intended to pave the way for the 'skyscraper city'.

From 1960, experiments started on building with no height restrictions. When 'Frontalmar', the first skyscraper, was built Benidorm started to develop – as the architects' bon mot has it, from a 'sardine tin' to a 'cigarette packet' town. The number of inhabitants had doubled between 1950 and 1960 and the tourist numbers increased significantly in the 1960s. Foreign visitors came to Benidorm in their own cars at first, until Benidorm linked up with the international air travel network when Altet airport opened in Alicante.

DEVELOPMENT:

Is the vision still alive? Who keeps it alive, and how?

Benidorm, sometimes referred to as the Spanish Manhattan, has more skyscrapers per inhabitant than any other city in the world. There is no doubt that the idea of relying on tourism as a source of income has been successful. Benidorm was originally a fishing town, and now has more hotel beds than any town other than Paris and London, and produces 11% of Spain's income from tourism. The population has increased more than tenfold since 1960.

This ultra-rapid growth brought a number of infrastructural problems with it that had to be resolved - adequate water supply, public transport and education had to be provided. Benidorm did not always show very much enthusiasm for this, as the architect Juan-José Chiner Vices has remarked. For example, the building of the motorway in the seventies was opposed just as much as it was supported. The town is still growing. The Gran Hotel Bali, with 52 storeys the tallest building on the Iberian peninsula, did not open until 2002, and more skyscrapers are being built in the hinterland to provide both housing and hotel facilities.

FUNDING/OWNERSHIP

Who owns the city, and how is it financed?

The town belongs to a confusingly large number of individual owners, some of whom are immigrants, from other EU countries in particular.

SOCIAL STRUCTURE:

Who lives here, who doesn't, and what networks exist among the residents?

The Spanish population of Benidorm moved in mainly from Andalucia and Castile. It now lives side by side with the 30% of foreigners, who come mainly from the UK and other EU countries. The official number of permanent residents is 69,000. But the real figures are undoubtedly higher, as many of the immigrants are not officially registered. In summer, there are about half a million people in Benidorm, including tourists.

Unlike many other Spanish holiday resorts, the Benidorm season lasts all year round. In the winter

months, the visitors are mostly pensioners. Many of them Spaniards, but the summer visitors are younger and the proportion of foreigners is higher. Many of the Spanish residents, and increasingly the immigrant inhabitants, are employed in the tourist industry and work in hotels, restaurants or municipal facilities.

LIVING CONDITIONS:

How do the inhabitants live – and what determines their living conditions?

Despite its tourist character, everyday life in Benidorm is quite 'normal' and in the districts a bit further away from the beach, life in the streets is the same as in any other Spanish town. The tourists spend most of their time in the hotels or near the beach. The urbanisation of Benidorm was not just aimed at effective development, but also at making the town more uniform. Developing the residential blocks was intended to give the inhabitants equal rights: each one was to have a light and airy flat, the same view of the sea and access to the beach. But in fact the intensive development meant that all the public spaces, beaches and roads are intensively used. People spend a great deal of time out of their homes each day: 15 hours, according to a study, three of which are taken up with walking around town or on the beach.

Private cars do not play a very big role but the bus service is very good all over Benidorm. The original idea of the development plan was that every residential block should have room for a green area as a result of its open form, but reality has since put paid to these plans. The open spaces have now largely been replaced with smaller buildings or car parks, used primarily by up to 40,000 visitors who arrive from other places daily.

SUSTAINABILITY:

What can be said about the resource-consciousness of the city – and about its environmental footprint?

Compared with the voracious urbanisation of the Spanish Mediterranean coast, in which often illegal settlements now cover a band fifty kilometres wide, the efficiency of resources and land use is considerably higher in Benidorm.

In recent years in particular, the urbanisation of the surrounding area has proceeded very rapidly. More has been built on the Valencian coast than in its whole previous settlement history. More and more people want their own house in the sun, so millions of Spanish dwellings are not owned by prosperous immigrants from countries such as the UK and Germany. Many stand empty for long periods each year, and can be reached only by car. The immigrants' interested are scarcely compatible with sustainable regional development. But they are entitled to vote in the Spanish local elections and so have considerable influence, even forming the majority in some wards. Building development on the Mediterranean coast seems unstoppable – and with it the region's consumption of resources. For example, a single golf course consumes as much water per year as 15,000 people. One third of Spain is already on the way to being transformed into a desert.

But Benidorm's residential blocks and high-rise buildings occupy a relatively insignificant amount of land in proportion to the population figures, and are also efficient in another respect: the people of Benidorm consume less water than the national average. People use mainly public transport, or get around on foot, and the available buildings are used intensively throughout the year. And even though tourism is not particularly ecologically sound because of the associated air travel, it can be assumed that concentrating floods of tourists in a place like Benidorm is considerably more environment friendly than the overbuilding and destruction that is taking place in the rest of Spain.

FUTURE PROSPECTS:

What will happen to the city in the future?

Presumably Benidorm will continue to grow, both horizontally and vertically. Even more skyscrapers and hotels are already being built. One challenge created by desertification in Spain will be the water supply. Economically, Benidorm will continue to benefit from mass tourism by air for some time, without being directly affected by its ecological and climatic consequences.





Planner

The inhabitants themselves.

Facts

Location	Christianshavn, Copenhagen, DK
Foundation	1971
Start of construction	1971
Area	0.34 km²
Population	approximately 850
Population density	2,500 inhabitants/km²



55°40'35"N
12°34'07"E

P. 66 Christiania in the Copenhagen city district of Christianshavn was established at the end of the 1960s after young residents opened the former site of a barracks and occupied it. Today, more than 800 people still live in the free settlement, which was initially tolerated as a social experiment.

P. 67 The people of Christiania have organised numerous facilities themselves, such as a post office, kindergartens and political decision-making bodies. Any possible improvements to the buildings or the organisation of Christiania are jointly decided on. The houses are not for sale and their occupants themselves renovate or extend them.

P. 68 Christiania is an open site with several entrances and, except for a few delivery vehicles, cars are not permitted inside. Every day sees the arrival of visitors who have come to take a stroll through the "village in a city" or to patronise one of the many cafés and restaurants.

P. 69 Apart from the original barracks buildings, the inhabitants also built numerous houses themselves in accordance with the criteria of environment-friendly building. The "banana house", for example, was built entirely with recycled materials.

07 CHRISTIANIA

VISION:

What vision is the city founded upon, and what does this vision encompass?

The 'Freetown' Christiania was created in 1971 when the area around the former military barracks on the historical ramparts in the Copenhagen borough of Christianshavn was occupied by young people. It was founded with the goal of "creating a self-governing society in which each and every individual can freely develop while bearing responsibility for the community." The aim was to create an economically self-sustaining community. After all attempts by the state to dislodge the inhabitants failed due to the area's size and the large number of inhabitants, both sides agreed in 1972 to tolerate Christiania as a 'social experiment'.

DEVELOPMENT:

Is the vision still alive? Who keeps it alive, and how?

More than 35 years after its founding, Christiania still has around 850 inhabitants, many of them third generation 'Christianites', to use the term they call themselves. The old barracks and houses have been renovated by the combined efforts of the inhabitants. Particularly in the 'Dyssen' area along the waterfront, a range of buildings has been created, whose original and individual designs are a testimony to their independence of architectural trends and city planning criteria. The Christianites have created a social network within the neighbourhood and set up many small companies and shops, restaurants, and cafés together with social facilities such as kindergartens. With thousands of visitors every day, the Christiania 'experiment' is now one of the biggest tourist attractions of Copenhagen.

FUNDING/OWNERSHIP

Who owns the city, and how is it financed?

Until 2004, the ground on which Christiania stands was the property of the Ministry of Defence. Thereafter ownership passed to the Finance Ministry as part of the 'normalisation plans' of the new liberal-conservative Danish government. The inhabitants reached an agreement with the Ministry of Defence in 1972

whereby the residents would pay the costs for water, electricity, refuse collection and the like. In addition to the taxes that every Christianite pays to the Danish state, Christiania pays the city of Copenhagen a compensation to make up for the loss in tax revenues.

The houses are not for sale and there are no lease contracts. Instead, every Christianite pays the same amount into a common fund. Living space is allocated on the basis of application procedures held in community forums, where every inhabitant can influence the choice of new people coming in.

SOCIAL STRUCTURE:

Who lives here, who doesn't, and what networks exist among the residents?

The population of Christiania is very varied. Many inhabitants have lived here since the founding of Christiania, while others have moved in later from many different parts of the world. The age of the population varies widely; it ranges from young families with small children to senior citizens born in the 1920s. Many of the Christiansites, among them former hippies, idealists and bohemians, earn their living as artists, work in social or artisan jobs or in various organizations in Christiania or Copenhagen or are studying at university. Christiania also attracts eccentrics and welfare recipients. "That's the nice thing about it," says one woman who has been living in Christiania since the seventies, "there are all sorts of people here and there is room for everyone."

Particularly people with manual skills are very much in demand. All the houses in Christiania were built or renovated collectively. "You first have to know how to lay down a sewer pipe or insulate a house," according to a Christianite. "All sorts of workmen live here, but they don't always have time to be everywhere."

Christiania governs itself: the consensual democracy may be sluggish and time-consuming with its communal forums and monthly district meetings, but it functions nevertheless. There are many small groups that look after different social areas. There is a home economics team, a gardening group, a team for waste disposal and a negotiation group, whose tasks consist primarily of communicating with the authorities on various matters.

LIVING CONDITIONS:

How do the inhabitants live – and what determines their living conditions?

Both inhabitants and visitors perceive Christiania as a small village in the middle of a city. Most of the residents know one another; the area is hilly and has been largely left unspoiled; it is crisscrossed with unpaved roads and paths and cars are not permitted in the area.

In the centre close to so-called Pusher Street, are renovated military apartment buildings, some of which have been partially remodelled inside, and small, older, brick houses. In more isolated areas, the inhabitants have converted some of the bastions and bulwarks of the former fortifications into dwellings and built a number of colourful and extravagant houses themselves.

The Christianites operate various facilities themselves, including a post office, a bath house, a grocery store, a bakery, kindergartens, and youth facilities as well as a theatre, concert halls, restaurants and cafés. In addition, there are several small companies such as the Green Recycling Hall (Den Grønne Genbrugshal), which belongs to the communal exchequer, a bicycle repair shop and a blacksmith's shop.

Christiania has many visitors every day; tourists or people from adjacent neighbourhoods who want to take a walk outdoors. However in recent years, following the new government policies, the 'Freestown' has experienced a massive increase in police presence, and there have been repeated violent clashes.

SUSTAINABILITY:

What can be said about the resource-consciousness of the city – and about its environmental footprint?

Christiania attaches great importance to recycling and to building methods designed to save resources. Several houses have been built with recycled materials; the 'Banana House' (Bananhuset), for example, which consists entirely of reused building materials and is insulated with natural materials such as wood shavings and wool. No money has been available for larger ecological projects, but the community does try to follow environment-friendly criteria on a smaller scale.

After an widespread building boom in the eighties, during which areas along the waterfront were threatened with extensive development, a complete halt was called in 1987 to any further building activities – until, in 1991, all parties finally agreed on a Green Plan for further development. Numerous houses were either relocated or entirely demolished to prevent the destruction of a sensitive natural area.

Although no cars are permitted in Christiana, around 130 cars are owned by some of the 850 inhabitants. In the past few years, the transport group has had to find parking spaces outside the residential area – and also create a serpentine shaped public park.

FUTURE PROSPECTS:

What will happen to the city in the future?

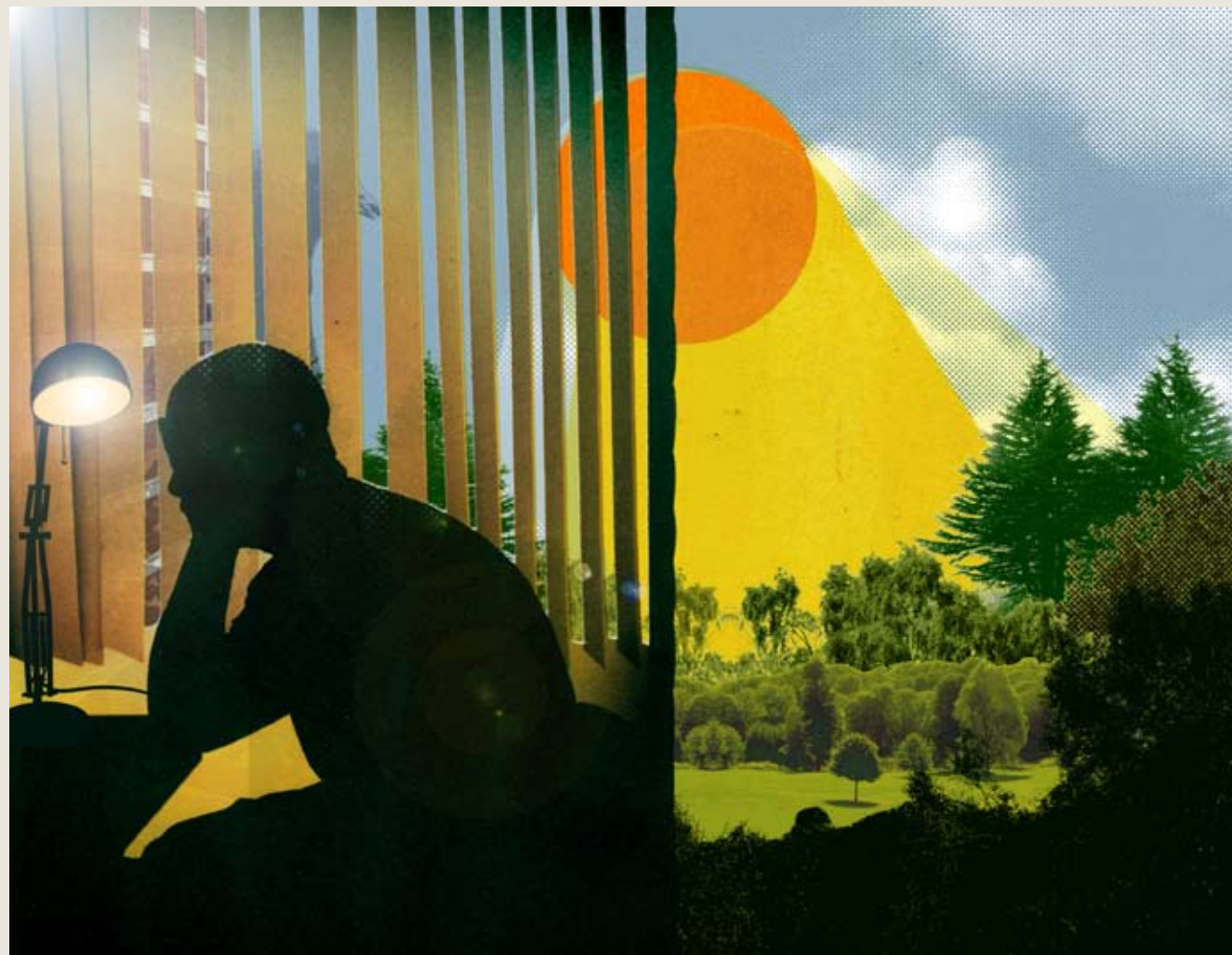
In 2001, Denmark returned a liberal-conservative government and, for the first time in the history of the 'Freetown', a majority of the Parliament was hostile to Christiania. The government's plans envisage a 'normalisation' and privatisation of Christiania. In 2004, it was decided to change the so-called Lex Christiania, such that a partial privatisation and the erection of new apartment houses would be possible on the valuable real estate. The residents fear that this would finally result in Christiania becoming just a 'normal' district of Copenhagen.

Meanwhile, the general support for the continuance of the social experiment is great: three fourths of all Danish citizens are in favour of Christianity being preserved, and an architectural competition commissioned by the government with the aim of creating a new master plan for Christianity came to nothing due to the limited number of submitted proposals and the lack of suitable concepts.





ENERGY DESIGN: ARCHITECTURE AND CLIMATE CHANGE



By Norbert Fisch, Stefan Plesser and Thomas Wilken
Illustrations by Claire Scully

How can we design our buildings to be more energy efficient? Through multidisciplinary planning from the word go, say the experts. But it is not always the case that measures conceived at the planning stage are actually implemented in practice. That's because modern building installations are becoming ever more complex, and the demands for convenience on the part of the user ever higher.

SINCE THE 1990S there has been a new actor on the scene in the building planning process. In co-operation with architects and departmental planners, it is the task of the energy designer to utilise, at the earliest possible stage, all the available potential for achieving the functional goals of a building with the greatest level of energy efficiency. Among other factors, this trend was initiated by the increasingly stringent and more comprehensive legal requirements pertaining to the energy efficiency of buildings.

The way forward was hugely controversial. In the 1990s the energy efficiency of buildings was suddenly the focal point of much discussion. In the light of the new, more stringent regulations, many people argued strongly that the freedom of architects to do their job was becoming irreversibly restricted by a tough new system of standards. Due to the level of heat insulation required, in future there would only be Styrofoam boxes and "arrow-slit architecture".

With the RWE Tower in Essen, Christoph Ingenhoven built the first "ecological tower block" in Germany, the first expression of a pervasive glass building style. The new buildings replaced the fully air-conditioned and mirrored-glass office blocks built on the American model (which were also primarily glass-oriented) and claimed for themselves the labels of energy efficiency and ecological responsibility.

In the late 1990s, Karl Gertis published an extensive theoretical inquiry into the new design concepts, which was critical of their record with regard to energy efficiency. At the same time he bemoaned the fact that there was a "stifling amount of qualitatively descriptive literature" on the subject, but that an urgent need still remained for "detailed measurements under practical conditions". The lack of certainty with regard to the practical effectiveness of the glazed facades not only led to the equation "glass=ecology" being frequently marketed uncritically and to inflationary effect, but also to criticism of them being similarly articulated on the basis of equally flimsy evidence.

Here the question resonated for the first time: do the innovative buildings of the 1990s actually work? Are they justified in bearing the "eco" label? Or are the reproaches one occasionally hears correct that the glass boxes are devourers of energy and that they overheat intolerably in summer into the bargain?

Left Excessive waste of energy with artificial light: If the daylight planning of a building is unsatisfactory and the sun protection not flexible enough, interior lighting will automatically go on – even in broad daylight.

The German government reacted to the necessity of building more energy-efficient buildings and to the lack of evidence of their practical effectiveness with a research programme entitled solarbau:MONITOR, which today bears the title EnBau and is a part of the research programme EnOB – Energieoptimiertes Bauen [energy-optimised building]. Since its inception, energy-optimised designs have not only been developed and implemented in more than 20 EnBau demonstration buildings, but they are also monitored and measured throughout their working life.

MONITORING OFFICE BUILDINGS: MEASUREMENT IS WORTH IT

At the IGS – the Institut für Gebäude- und Solartechnik [Institute for Building and Solar Engineering] at the Technical University (TU) of Braunschweig, we have developed a number of the concepts used in these demonstration buildings. The buildings were then examined by means of an intensive monitoring process during actual operational use, and it was determined that an increase in energy efficiency of more than 50% above the standard is possible, without any negative impact on comfort.

A well-known example is the EnergieForum in Berlin, one of whose features is a glazed, south-facing atrium that, thanks to structurally high-grade cladding and slim structural design, does not overheat in summer. It has a high degree of transparency and does not require additional solar protection.

An integrated energy supply concept was developed for the office block, paying particular attention to regenerative and rational energy technologies. Between 2003 and 2006, a long-term study documented the operation of the building including user comfort. The measurement results show that the primary energy consumption level was up to 15% lower than the threshold value. An excess consumption of nearly 26% in respect of heating energy is compensated for through a greater yield from regenerative energy using thermal heat pumps and ground posts.

With the commissioning of the building management system in the autumn of 2003, individual problems and faults during operation of the building were detected and rectified in close co-operation with the building's management staff.

Measurements were taken in a total of 56 office rooms in

Cold from above, warm from below: If the technical systems of a building are not optimally balanced, the well-being of the occupants will suffer. And not everyone is willing to adapt to climatic extremes in the building with appropriate clothing.

the new building to evaluate the heat insulation properties in the summer months. The detailed analysis showed that the fact that the air temperature in the rooms sometimes exceeded 27°C can be explained by incompletely optimised management and building systems. Specifically, the following faults occurred:

Flow temperature too high during concrete core tempering due to a building systems error. In individual rooms this led to room air temperatures of over 26°C, particularly during the transitional periods in spring and autumn

A defective valve in the dynamic heating system led to the inlet air temperature in the offices being raised too sharply

The controller for the cooling function temperature sensors was not calibrated, and gave readings for room air temperatures that were too low. This led to the cooling of the corresponding rooms being triggered too late.

By optimising the operation, in the first three years of the building's useful life around 735 MWh of heating energy and costs of around €35,000 were saved. Without intensive monitoring, the increased energy consumption levels would not have been discovered. The example of the EnergieForum shows that planning, implementation and, above all, actual operation must be closely monitored, in order to run buildings effectively.

THE USERS WANT A SAY

As a further demonstration building, the Informatics Centre at the TU Braunschweig filled a shortfall in town planning requirements with the addition of an annex on university-owned land in 2001. Three-quarters of the building's area capacity is available for offices and administration, while the remainder is used as laboratories. Until 2007, the operation of the building was accompanied by scientific appraisal in the context of the EVA evaluation project.

Alongside a primary energy requirement of less than 100 kWh/m²NGFa, a substantive planning goal was to achieve a cost-optimised combination of various constructional measures to reduce annual operating costs. The original plan for an open inner courtyard was changed on a cost-neutral basis into a glass-covered atrium, which then became the central building block of the climate and energy design. The highly heat-insulated building was supplied with mains power and district heating; only the computing rooms were equipped

with cooling modules, the waste heat from which is used to heat the atrium in winter.

Further fundamental elements of the design are natural ventilation through the windows, an air inlet atrium that is combined with a design for night-time ventilation, and a window surface area of only about 35% to guard against overheating in the summer. In addition, there is automatic solar protection, along with daylight and motion-detector controlled lighting.

The empirically determined energy consumption values for the building are in line with the target values, or even a little lower. Alongside the optimisation of energy efficiency, the focus of the evaluation was on internal climate and user comfort in the standard offices and the ventilation concept for the air inlet atrium.

Under normal summer conditions, temperatures in all office rooms exceeded 26°C for less than 10% of working time. In addition to the optimised cladding, night-time ventilation protects against overheating. The users are taking the concept to heart, and at the same time building costs are reduced by eliminating the need for automation.

In winter, the limited temperature selection range in the office rooms of 20°C ±1 Kelvin led to dissatisfaction among users. Some felt that a maximum internal air temperature of 21°C was not high enough. The selection range was therefore increased.

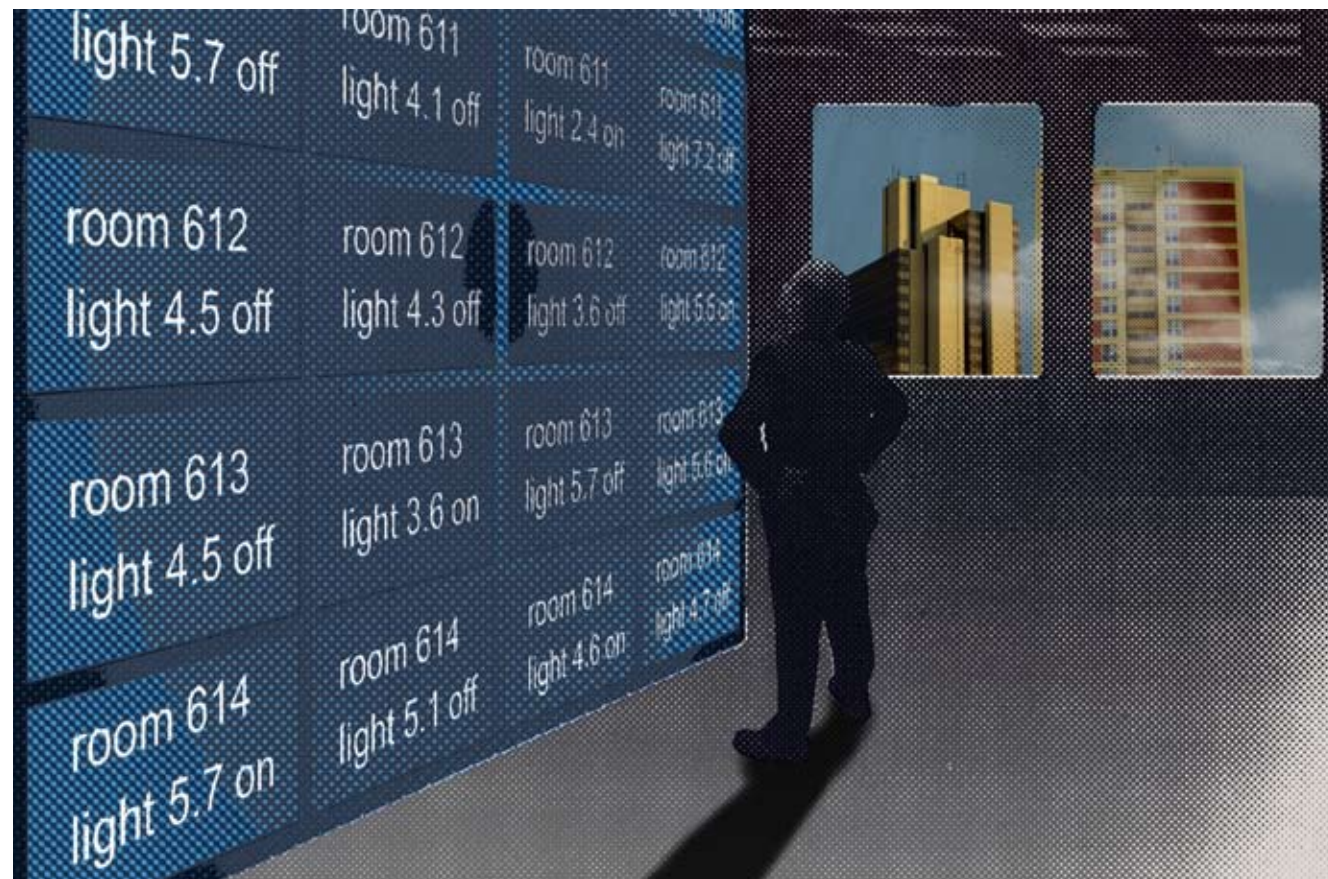
The light switches with time delay relays installed in internal corridors did not find sufficiently widespread acceptance among the users and were therefore replaced with a time switch. This has the effect that corridor lighting is in operation throughout the day, and in some parts of the building also at night and at weekends, accounting for a considerable proportion of the total electricity consumption (daytime >10%).

INTEGRATED PLANNING FROM THE START

The buildings show that the desired properties of energy efficiency and user comfort could not be realised using traditional methods. The new architectural concepts demanded a re-calibration of thought processes in all areas: planning, construction and operation. The term "integrated planning" took hold relatively quickly. If you wanted to create lean engineering concepts and transparent buildings that were not energy



With the building technology, the operating interfaces have also become more complex. They are normally more compact these days than in the picture, but the requirements placed on users and facility managers alike have grown. The same applies to manufacturers: They have to ensure that control elements are intuitively understandable and that the user does not suffocate in a 'jumbled mess of letters'.



sinks and that offered a high level of comfort, then you had to take all aspects into account from the very start; location, building envelope, heating, ventilation, cooling and building automation. In an increasing number of projects, the complex requirements led to an expert being brought in at an early stage, who could bring all of the various threads from design, construction and engineering together in a single integrated concept. Since then, the energy designer has been a fixture on demanding projects and an indispensable partner for building owners and architects.

But these projects also made another thing clear. The complex designs and demanding planning process made it necessary to improve the quality standards in building construction

and operation. The efficient operation of systems in the demonstration buildings was not always successfully implemented from the outset, despite good planning. Often it was only after the two-year period of scientific monitoring that the desired level of energy efficiency was reached.

THE EVA PROJECT

For us, the controversial discussions surrounding glass architecture and our own findings from the research projects was the impetus to put the above mentioned "innovative" and "ecological" buildings, which had not gone through this optimisation phase after completion, on the test bench. We were able to collate extensive findings relating to the actual operation

of buildings from the EVA project (evaluation of energy concepts for office buildings), in which some 20 buildings from 1990 to 2002 (and other projects) were investigated. The first projects are coming to an end now, and their results are wide-ranging.

The energy efficiency of modern office buildings is on average around twice as high as that of buildings from the 1960s and 70s. The mean value for annual primary energy consumption of around 280 kWhPE/(m²NGfa) was, however, also significantly higher than the characteristic values for the demonstration buildings, i.e. the standard that is technically/economically attainable. At the same time the energy consumption of naturally ventilated buildings was around 35% lower than that of buildings predominantly equipped with mechanical ventilation systems.

It could also be established that the buildings under investigation, unlike many buildings from the 1970s afflicted with "sick building syndrome", were largely able to offer a high level of user comfort. The measurements revealed significant limitations only in the case of overheating in the summer and CO₂ concentrations. However, the detail of the investigations shows further surprises. Thus in 60 office rooms, no correlation was detected between the proportion of the facade that was glazed and the number of hours of overheating with a room temperature in excess of 26°C. The cause is presumably the strong influence of user behaviour, particularly through incorrect use of the solar protection system and continuous ventilation in summer. What was not expected was the fact that, in the case of mechanical ventilation, only a small number of rooms exhibited an increased CO₂ concentration compared to window ventilation. This, too, is an indication of the importance of user behaviour. Surveys of the employees by the University of Karlsruhe of the EVA study confirmed the measurement results. The subjective perception of room temperature (too warm/too cold) had a significant effect on the level of satisfaction with the room's overall climate. But more important is the user's opportunity to influence the room's climate. The user must be given effective opportunities to influence the climate of the room in which they are working.

The functional analyses of building use showed that they often do not function in the manner (or as well) as should be

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Dipl.-Ing. arch. Thomas Wilken has been a research associate at the Institute for Building and Solar Technology of the Technical University of Braunschweig since 2001. Alongside teaching, his work at the Institute includes designing energy concepts for buildings and residential complexes and research into the energy efficiency of non-residential buildings.

possible according to the plans. Common problems are system operation times that are not adjusted to match actual use, hydraulic problems leading to persistent operational failings, so that for example the opportunity of having efficient fresh air cooling remains unutilised, along with sub-optimal regulation of building automation systems.

The lack of clear standards from the planning stage for the operational phase, deficient quality assurance and a lack of information and training for users, clearly result in the fact that the designs are not always realised in practice. The potential means of monitoring a building's operation are often not suited to verifying the building's complex regulation and control strategies, or to optimising them.

In order to utilise efficiency potentials during operation, IGS will place new focus on optimising building operation from an energy use point of view. Alongside integrated planning, from our point of view continuous quality assurance over the whole life cycle is of increasing importance. Buildings will achieve a higher degree of energy efficiency through the attainment of higher levels of quality in the planning, construction and operational phases.

Further improvements in our building stock from an energy point of view are possible and necessary. We have good planning tools at our disposal. The path leads to greater quality from the initial conversation with the building owner right through to end use. A precondition of this is that building owners understand the need for quality. In our experience, building owners generally proceed on the assumption that a building operates in a "plug&play" manner. This is not the case with modern buildings. They require a greater degree of attention - and this must be recognised and taken into account.

24°03'35" S
131°24'22" E
Photo by Neil Emmerson
Robert Harding World Imagery
Getty Images



GLENN MURCUTT: TOUCHING THE EARTH LIGHTLY



By Françoise Fromonot
Photos by Reiner Blunck and
Anthony Browell

Australian landscapes with their incredible scope and variety hold a special fascination for many. For Glenn Murcutt, the country's most renowned architect, this is the starting point for each of his designs. Murcutt has mastered the skill of subtly incorporating the often concealed patterns of a particular landscape – its climate, topography, geology and the course charted by the sun and moon – into his architecture.

Opposite Outside terrace of the Ball-Eastaway house in Glenorie. Here, Glen Murcutt creates outdoor areas which are protected against wind and weather but still give the occupants the feeling that they are in the middle of nature.



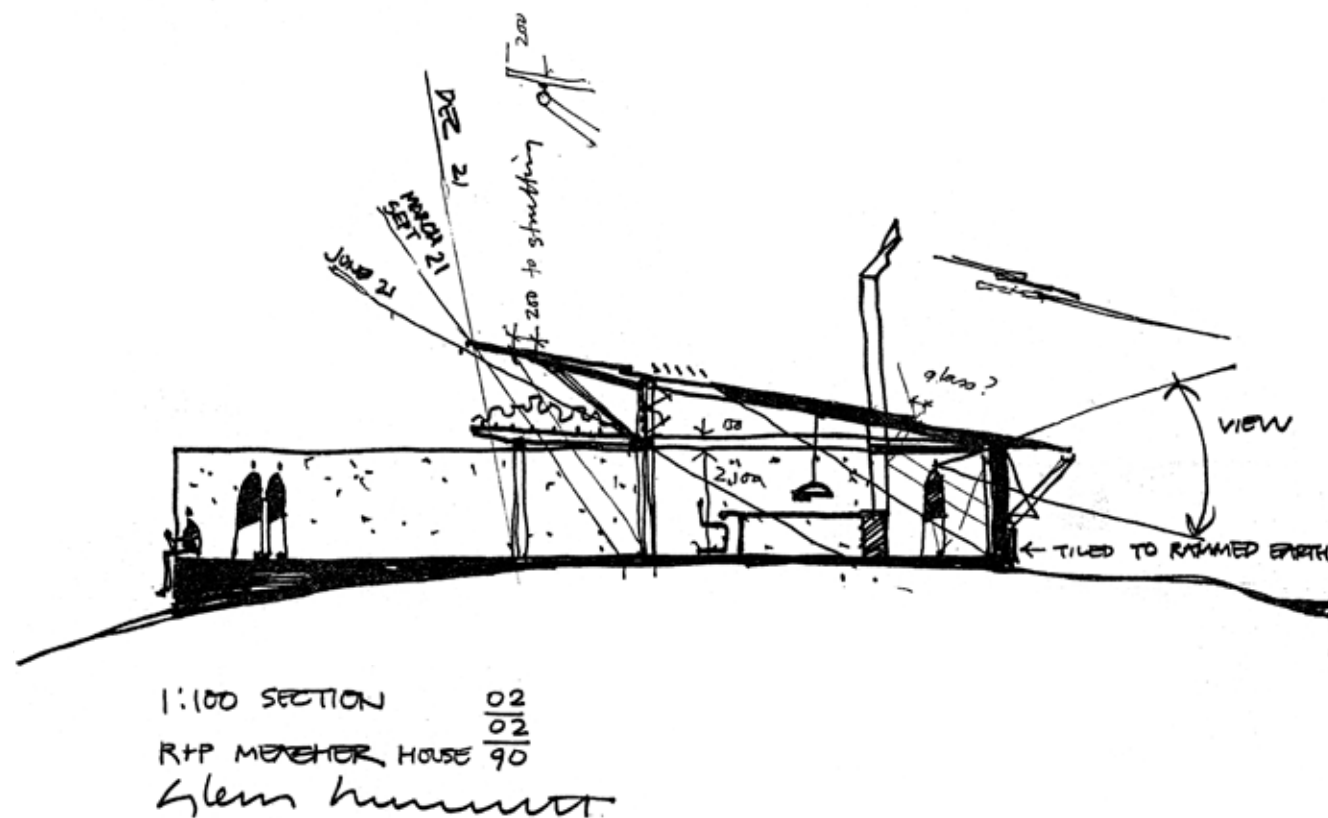
As the first Australian architect to have acquired international fame (demonstrated by the award of the Pritzker Prize in 2002), Glenn Murcutt is in many respects an exception, even a curiosity. He has worked in Sydney for forty-five years without assistants or offices, and he has always refused to work outside his own country, where practically his only creations are houses. The clients of this solitary craftsman must register on a waiting list of several years. In spite of, or perhaps because of, this approach with regard to the professional practice of architecture, particularly radical in this era of globalisation, Murcutt has become an authority in a domain, which during the course of his career has gained significant importance in the public realm, that of "sustainable architecture". And he remains one of the most outstanding representatives of an "ecological functionalism" that he helped to invent.

According to Murcutt, a building must be a climatic device acting as a mediator between Man and Nature, with minimal costs and environmental impact, and an architectural translation of the landscape in which it is located. The planning and structuring of

his houses take into account solar and lunar movements, the angle of the sun according to latitude, dominant winds, rains, topography, and geology; information specific to each site, which Murcutt incorporates into the design in the same way as domestic functions. Canopies, roofs, mobile façades, porous walls and rainwater pipes become architectural elements in their own right, contributing to the functioning of the buildings and sculpting their aesthetic. Economy of materials and non-renewable energy resources is one of the key aspects of the design of the buildings and the sizing of each of their elements. No house is equipped with air conditioning, nor, more often than not, heating. These sophisticated cabins potentially find answers, inherent in the very substance of their envelope, to all types of climatic situations. However, if Murcutt endeavours to transfer the local conditions into each project through architecture, he also likes to affirm the contrast between natural landscapes and the light appearance of his exteriors, with spirited structures, favouring ordinary materials – metal, corrugated iron, wood, etc. – and standard industrial products, which he dis-

tinguishes through highly elegant details of construction.

Murcutt truly worships the Australian landscape and its genius loci. He has inherited from his family his pioneer spirit, his individualist philosophy, directed towards life within nature, inspired from his childhood by Henri David Thoreau and the American transcendentalists. His reading and his experience as a student gave him an interest in Mies van der Rohe, Frank Lloyd Wright, Jørn Utzon and Californian Case Study Houses. His trips to Europe in the sixties taught him European and American modernism. The rediscovery of its regional traditions – vernacular, rural and industrial buildings, but above all the rich culture of Aboriginal territory – that Australia experienced during the following decade, in the search for a cultural identity freed from the models imported by European colonisation, has had a strong influence on him. Resting on piles with long planes, flowing and stripped bare, the most significant creations at the start of his career (such as his farmhouse in Kempsey in 1975) owe as much to the minimalism and formal order of Mies van der Rohe's



Farnsworth house as to agricultural buildings from the Australian countryside.

It is a type of critical fusion between international modernism and local traditions that Murcutt has worked on over the years. This synthesis has led him to develop, through the spatial and ethical principles reaffirmed with each project, a "type" of dwelling that blends the idealised simple life of the "gentle savage", in harmony with a fundamental nature and the benefits of modern comfort. This type of house endures in several recurring aspects, presented over the years according to the site and the client. A long and low shape distributes the entire domestic activities along its length. The two main facades, one opaque and low, the other high and open, allow for the complementary sensations of support and opening, in connection with solar movements, the views and the winds; they shelter respectively the serving space and the served space. The climatic exterior negotiates the relationship between the cabin and the location, weaving an instable frontier between the spaces of life and the large dimension of territory. Certain works by Murcutt witness his social

commitment towards the representatives of the continent's native culture, which inspired him so much. In the nineties, with the Marika-Alderton house, he tested a prototype residence for an Aboriginal family in the tropical north, entirely prefabricated with no glazing. A large hall on piles surrounded with tipping shutters, which opens in the day and closes at night like a flower. In Kempsey, close to one of his first houses, he converted a tractor hangar into a studio using mainly recycled wood. His rare larger scale projects, like the Yvonne and Arthur Boyd art centre in Riversdale (1996-99), are treated like large houses, adapting the same architectural and above all climatic principles to collective and public pressure. In the image of life itself, Murcutt conceives each building as a temporary shelter on a journey into the vast territory of the continent; "a moment of landscape" rather than a truly perennial construction. His architecture seeks to excess the transitory character of human occupation on the planet. Taking for his own a proverb attributed to Aborigines from Western Australia, Murcutt has always determined to "touch the earth lightly". His work is also a gamble

on the ability of an individual, working on a local scale on very small projects, to influence the world in a lasting way.

P. 79 Topographic section of the Meagher house in Bowral, New South Wales. In Australia, the weather is similar to Europe except that everything is the other way round: the warming sun shines the north and the cold wind blows from the south.

Opposite Section of the Meagher house. Like many of Murcutt's houses, the roof is separated from the outer walls - in this case, plastered - by horizontal window strips. This enables a great deal of daylight to enter the house without overheating the interior or diminishing the privacy of the occupants.

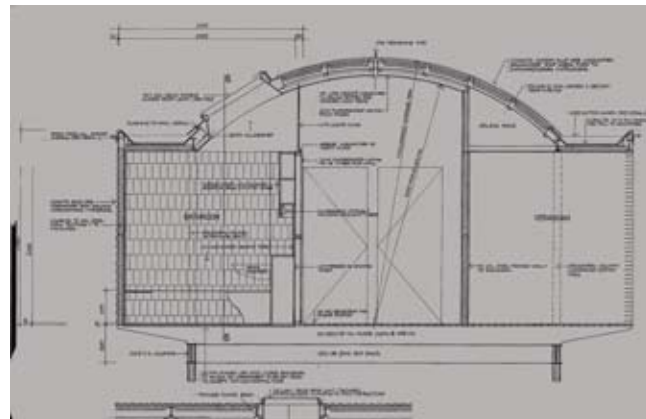
Below With thin steel posts as its only means of support, the Ball-Eastaway studio house rises above the slightly inclined slope, becoming a perfect symbol of Glenn Murcutt's motto 'Touch the earth lightly'.



Below Cross-section of the Ball-Eastaway house.

The living area with its vaulted ceiling receives daylight primarily through ceiling-high windows on the front sides and several roof windows.

Opposite Only a long wooden bridge connects the house to the land on which it is built. Murcutt dispensed with a prestigious entrance. The house looks like an object that has been temporarily deposited and could disappear without trace at any time.



BALL-EASTAWAY HOUSE, GLENORIE (SYDNEY) NSW, 1980–1983



The Ball-Eastaway house is an exemplary illustration of Murcutt's approach and ethics, and one of the most beautiful successes of his domestic architecture from the eighties. Here, Murcutt tested for the first time the possibility of a light dwelling, entirely made from corrugated iron, creating the frugal and refined house, which was to become his style of construction, and thereby launching his international reputation. This small, very economical house (less than 100 square metres for around 40,000 Australian dollars at the time) was requested by a couple of painters from Sydney, who wanted to leave city life and install themselves in the forest close to the national park which borders Sydney to the north.

The house is raised on thin piles in order not to disturb the natural flow of water on the slope; it only touches the rock with seven pairs of posts made of thin metallic tubes. Two wide, flat gutters channel rainwater from the rounded roof towards the downpipes, monumentalised by their symmetrical nature at the two extremities of the abode. They constitute an effective method of drainage as well as an expression of the im-

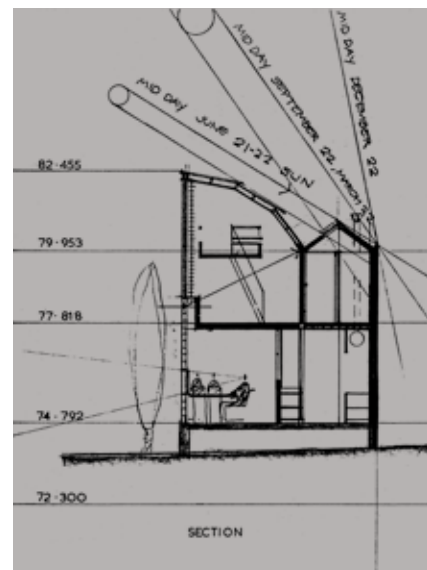
portance of water in this dry, highly flammable landscape.

The living spaces are divided in the layout according to the symmetries and balances suggested by the construction of the house, the climatic movements and the views. Kitchen, bathroom and storage, lit from overhead by fanlights, are grouped against the entrance façade, which is totally blank and southeast-facing, on the side of the inclement winds. The house has two verandas. This traditional space in the Australian house is here reinterpreted as a place archetypal of the ambiguity between the outside and the inside. To represent the gradual transition between the built order and the natural order, Murcutt stripped the floor and the roof of the large veranda of their finishing materials, at the boundaries with the earth and the sky. To reinforce the impression of a precarious but serene balance between the building and the landscape, he suspended above the rocky plateau, which extends under the house, a fragile access bridge, perfectly horizontal, and treated the two long vertical walls as thin suspended planes.



28 metres long and only 5.80 metres, the Littlemore house profits from its position next to a public park. This acts as an 'extended garden' to which the living areas are aligned.





LITTLEMORE HOUSE, WOOLLAHRA (SYDNEY), NSW, 1983–1986

Situated in a residential quarter of terraced houses in east-central Sydney, and dating from the Victorian era, the Littlemore house was the first project for Murcutt in a relatively dense urban context. Instead of opening the house on its small side like the neighbouring buildings, Murcutt pivoted the principal direction 90°, so the residents could benefit from a large north-facing façade. Damp rooms and passageways are brought together on the other side, backed against the long adjoining blank south-facing wall, in a narrow continuous strip lit naturally via the roof. Two metallic pavilions used as living spaces are transplanted onto this spine, largely glazed and equipped with the usual devices for controlling air and light. At square level, a screen of paved glass protects the intimacy of the kitchen and filters the views into the interior. On the first floor, the children's bedrooms are conceived as small split-level apartments based on the model of an artist's studio, giving an appearance of height in relation to the clear space of the square. They are lit and ventilated naturally by adjustable glass louvers, doubled on the outside with aluminium Vene-

tian blinds. The beds are hoisted at mezzanine level above work and play space. Murcutt removed the window breasts from the free-flowing façade to be able to place a horizontal hand-rail at the border between the two materials of which it is composed, which visually increases the vertical size of the lower level and reinforces the urban character of the façade. Even in the city, the landscape informs the architecture.



Opposite left Cross-section of the Littlemore house with day-light concept.

Opposite The narrow section in the north with corridor and auxiliary rooms passes through the whole house and receives light through roof windows along its entire length.

Left Like a tower and almost without windows, the road-facing facade of the building reaches towards the sky. Here as well, Murcutt dispensed with prestigious features, especially in view of the fact that the house is not oriented to the road but to the adjacent green area at the side.

"Glenn Murcutt's architecture shows the transitory character of human occupation on the planet. Taking for his own a proverb attributed to Aborigines from Western Australia, Murcutt has always determined to 'touch the earth lightly.'"



Opposite The corrugated metal roofs contrast starkly with the solid, ochre-coloured plastered walls of the house. The eaves were designed in such a way that sunshine reaches deep into the living areas only in Winter.

MEAGHER HOUSE, BOWRAL, NSW, 1988-1992

This country house is located around 150 kilometres southwest of Sydney, in the relatively continental climate. The land, which belongs to an agricultural property, consists of a sloping prairie planted with magnificent eucalyptus. The view is beautiful from the summit towards the valley, lit by the sun from the north. As always, Murcutt favoured this direction in the distribution of the building, and installed it at the foot of the slope to protect it from the southerly and south-westerly winds and to conserve the natural outline from the crest. The house is relatively independent from urban networks for its provision of water and waste disposal, and its corrugated iron reservoirs have a storage capacity of rainwater of up to 33,000 litres. A guiding course connects the house to access routes, and forms the structure of the entire layout according to an almost cinematographic, linear course, all the while taking different shapes according to the nature and function of the distributed spaces. The construction combines double brick masonry and a silver-coated metallic structure, which carries the vast roof of corrugated iron, raised up towards the north to let the low

Top right As in many of his buildings, Murcutt divided the rooms of the Meagher house into two sections, offset from each other: on the left is the guest apartment and, on the right, the main house.

Bottom right On the inside, white ceilings ensure basic glare-free lighting. The light from the north is filtered by blinds before it enters the room through the glass facades.

Next page The tanks on the south side of the house can hold 33,000 litres of rainwater. Together with a biological sewage system, they make the house relatively independent of the public water supply and removal system.





THE KNACK OF LIGHTNESS



PHOTO: YALE JOEL / TIME & LIFE PICTURES / GETTY IMAGES

By Ed van Hinte

'To touch the earth lightly' is a fitting metaphor for a life style with little impact on the environment. In architecture, product design and transportation engineering, the concept of lightness implies efficiency and a sparing use of resources. However, many of the advantages of lightness are not fully appreciated by traditional methods of life-cycle assessment.

THERE IS A CERTAIN rank order in the current estimation of importance of saving weight. In the aerospace industry, lightness has always been crucial for the simple reason of profitability. We look for lightness in everything we carry and wear ourselves, such as clothes and (electronic) accessories, since we like to live comfortable lives. Until now lightness hardly has been an issue in everything else that mankind produces, including larger consumer goods, means of transportation over land and water and of course buildings. The rapidly rising costs of energy, increasing CO₂ emission and the gigantic amount of waste that we produce are now changing this picture. We are learning that saving weight may contribute to a more light-footed presence of people on the planet and that this change comes with a beneficial increase in flexibility and productivity. Lightness is turning into an interesting incentive for innovation.

THE REDISCOVERY OF LIGHTNESS

Lightness is certainly not an entirely new issue. Rather it is a theme that used to be common sense among our primeval predecessors, then faded away into obscurity and is now gradually regaining interest. In ancient times, when mankind mainly led a nomadic life, everything simply had to be light because people had to be able to take their possessions with them when they were wandering from one place to the next to gather food. At a certain point they discovered the possibility of exploiting animals. The invention of the wheel, and particularly of ships, considerably increased the amount of weight that could be transported. At the end of the 18th century, the invention of the steam engine heralded the age of a more abstract form of transportation energy that was generated by burning fossil fuels.

All these changes coincided with the evolution of materials that were used in artefacts, mainly expressed in a rapidly increasing use of metals; so much so that from about 1850 an almost religious belief arose in the potential of iron and steel as an incentive for progress. Metal idolatry reached its peak around the Second World War but from then on plastics started to conquer material markets, mainly due to the fact that they allow production of complex forms on a massive scale. Nevertheless the awareness among the general public that there was a certain price tag to the ever growing con-

sumption of energy and materials, and that mass production and consumption had truly damaging effects, did not occur until fairly recently.

Towards the end of the 1960s, a tool was developed to analyse energy consumption of any given product during production and use, the well-known LCA, or Life Cycle Assessment; but it did not start to include pollution effects until about fifteen years later. Now the LCA is fully established and is certainly useful in comparing different solutions in terms of environmental friendliness. Strangely though, because of this comparative use, it has some drawbacks that tend to be overlooked. It is not particularly helpful in supporting radical strategic change towards lightness. Weight reduction happens to be a consideration that seems to be of minor importance when viewed according to LCA conventions. A good example of this is the building industry. Throughout the life cycle of a house or an office facility, energy consumption for climate control accounts for by far the largest contribution to environmental effects. For this reason, builders and life cycle analysts tend to conclude that losing a couple of tons of concrete will not make a meaningful difference to any building, and from the LCA point of view that is correct. Nevertheless, the building industry as a whole is responsible for about one quarter of all transportation and produces one third of all waste. So despite the modest contribution of weight to the environmental effects of one building, the total sum is certainly not negligible. This argument becomes stronger with my proposition that the weight of buildings could be as much as 95 percent lower than it is today. To achieve this goal, an entirely new concept for the building process would be needed, involving prefabrication of light building elements and exclusion of the transportation of heavy materials, like sand, that always are available at the building site anyway. Imagine the implications: one truck with material supplies for a dwelling instead of twenty. Of course this change cannot be made overnight. It requires both technological development and the design of an identity for lightness in relation to buildings.

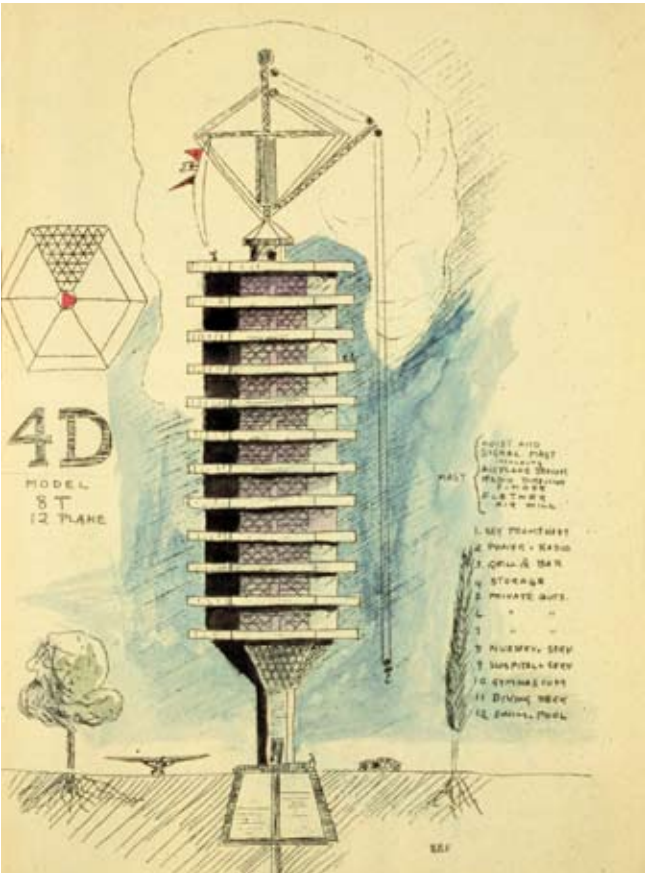
LIGHTWEIGHT MATERIALS, LIGHTWEIGHT STRUCTURES

Most people tend to associate lightness with light materials. Although that thought is understandable, it certainly does not

P. 92 Visionary of lightweight construction – and ecological thinking: Buckminster Fuller demonstrated a space frame-work made of rods in 1959, which he had already used for his 'geodesic' domes.

constitute the whole story. A structure has to distribute forces and to design it properly, it is necessary to consider the properties of materials, the processes by which they are formed and the functional requirements they have to fulfil in the design concept. Lightness requires fine-tuning and integration of everything from bearing loads to climate control and decoration. Here is an example to clarify that lightness is not just a material issue: aluminium is considered a light material and concrete is thought to be quite heavy. In fact, aluminium has a slightly higher density than concrete. It is just that for a certain structural solution you only need little aluminium and it can be worked to a far more refined level of precision. Moreover, aluminium can deal with both tension and compression stresses, whereas concrete can only handle the latter. That is what causes aluminium's lightweight reputation. The great visionary engineer and architect Richard Buckminster Fuller expressed this more complete viewpoint in stating: "In architecture form is a noun; in industry form is a verb." He was an advocate of lightness, or 'lightfulness' as he called it, long before it required the urgency it now has, and already foresaw the challenges we are facing now. He is most famous for his principle of the dome structure. Many of those were built. He also designed ultra-light '4D-towers', so named because of the inclusion of the factors of time and change. One of those designs had ten metal stories and built-in furniture, and it was supposed be flown to its site by a Zeppelin, the largest rigid airship ever built. It could carry 60 tons, which is not a lot for a ten-storey building. In a cartoon, the designer even suggested flying the entirely self-supporting tower to the North Pole, dropping a bomb on the sight, filling the icy crater with cement to create a foundation, and consequently placing the structure in it. Buckminster Fuller obviously had no idea that the disappearance of the northern ice cap would already be foreseeable. But in terms of structure his vision is important, for in his 4D-towers he applied the 'tensegrity' principle. This term is a contraction of the words 'tensional' and 'integrity'. Tensegrity implies the radical distribution of tension and compression forces in a structure in order to minimise the use of materials. Buckminster Fuller's towers consist of a column in the middle to take up all compression. The floors hang from steel cables attached to the top. Later the designer devised a

Below Buckminster Fuller's '4D towers' consisted of a central pylon from which the individual floor levels were suspended. Buckminster planned to set them down by zeppelin at previously uninhabited places, for instance at the North Pole.



moving aerodynamic skin around such towers to minimise the load caused by wind forces.

Despite being a visionary, Buckminster Fuller was also a man of the metal era. But he had an open mind and if he had known about today's structural possibilities, there is no doubt that he would have employed them eagerly. Nowadays plastics combined with strong fibres present new opportunities to create even lighter structures than Buckminster Fuller envisioned. Fibre reinforced polymers are commonly known as composites. Rather than being a new kind of material, they should be considered a type of structure that evolves from combining materials with different properties. Composite thinking has been around for ages and can be traced back to early human cul-

Right "I have built very little. I have invented many 'castles in the air'", said Frei Otto about himself. Without doubt, he made the building of tents in the industrialized world reputable again: Above is a Bedouin tent in Morocco, below the Olympia Park in Munich.



**Economy in the sky:
The Boeing 787 'Dreamliner'
is the first airplane with a
fuselage made mostly of
carbon fibre reinforced plastics.
It is meant to carry 200 to 300
passengers in a particularly cost
and energy-saving manner.**



PHOTO: BOEING IMAGE

tures: Pharaoh Tutanchamen's chariot had wheels composed of wood for compression and a rim of dried animal sinew for tension. Composite bows for shooting from horseback, as used by the Mongols and the Turks, date back at least 3,000 years. Today's high-performance composites usually consist of long, strong fibres in a predetermined arrangement, such as a woven textile embedded in a strong resin. They also work according to the principle of tensegrity: the fibres take up tension forces and the polymer deals with pressure. A carrying structure, then, can be engineered to take up forces in the best possible way. It can offer the opportunity for drastic weight reduction in buildings. If loads are considerable, like the ones to be found in high-rise buildings or bridges, the composite is likely to be

a carbon fibre reinforced polymer. Currently this solution is conquering the world of civil aviation. The Boeing 787 (the so-called 'Dreamliner'), due to be delivered at the end of this year, is the first full composite passenger aircraft. Airbus will follow some five years later with the A350XWB. This kind of applications leads one to believe that carbon fibre reinforced polymers are quite expensive. The opposite is true, however. Composite technology can save costs in several respects, otherwise it would not be applied in airplanes. For buildings it is important that the entire structure's life cycle is considered. The time needed for building is almost negligible and maintenance costs are eliminated because the applied resins do not require protection against corrosion or climatic influences. Transportation

of parts becomes cheaper and the need for heavy machinery at the building site decreases. In the end, structural building parts can be re-used as such. (Carbon fibre reinforced polymers are difficult to recycle, but recycling, which is an energy consuming process of destroying added value, should not be necessary, provided the structural elements are properly designed for re-use.) This idea is in line with the currently popular cradle-to-cradle principle as advocated by architect William McDonough and chemist Michael Braungart, particularly the concept of forever reusing parts and materials that belong to what they call the "technosphere".

SEDUCTIVE LIGHTNESS: THE AESTHETICS OF ECONOMY

So far, there are not many examples of carbon-based building structures, but one is particularly interesting. It is a 24-metre bridge produced by Fibercore Europe and Haasnoot Bruggen in Rotterdam. It can be mass-produced for different requirements. This one weighs about 12 tons, which is over 95 percent lighter than a concrete bridge of the same dimensions - it can even float - and it can carry about 75 tons: a demonstration of excellent structural efficiency. It was put in place in a quarter of an hour in Dronten in the middle of the Netherlands after it had travelled to the JEC composite fair in Paris. As an initial investment, the bridge costs the same as a concrete one. The reason for the 'normal' price is that, because of the quality of the materials, only very little of them are needed, a fraction of the amount that a steel reinforced concrete bridge would require. Weight savings and low transportation costs usually derive from the fact that less material is needed if the material is strong. An extensive LCA study is currently being done and it is not unlikely that this bridge will perform very well in terms of CO₂ emission, because of the reduction in the amount of material needed. Real cost savings occur later on during use, because a polymer bridge needs not maintenance, except for - and this is where the story becomes a bit strange - the railing along the side. The bridge accommodates any kind of railing solution, but the architect decided in favour of steel, probably according to the conventions of his profession. The finish of the bridge is even stranger. In cars and bicycles, carbon fibre is prestigious. It is polished and shown off. The surface of this bridge, however, is covered with a thick layer of

paint, to make it look like concrete. People tend to distrust a light bridge that is made of the same material that is used in the most expensive cars.

Here we touch on the aesthetic side of lightness. It is possible to demonstrate that light structures can be produced and that doing so can be profitable and advantageous to the environment, but to be seductive they also must be familiar and trustworthy. Light structures behave differently. They may be springy and squeaky because they have elastic properties, and often sound hollow when you knock on them. Ways have to be explored to help users get accustomed to lightweight environments.

There is another interesting aspect to light structural elements - the possibility to re-use them, which also happens to be a theme that LCAs do not really address. Building products like the bridge simply will not break. There could be a second-hand market. So buildings, and even cities, can become continuously flexible in a far more sustainable and rubble-less way than they are now. Insofar as building components are not structural, they can be designed to belong to the 'cradle-to-cradle' biosphere. They will return to dust. Building will become reversible, which is about as light-footed as it can get.

Ed van Hinte, MSc (Industrial Design) works as a free-lance publicist and editor, mainly for O10 publishers in Rotterdam. He teaches, organises and curates exhibitions. He founded Lightness Studios (www.lightness-studios.nl) to stimulate development and application of lightweight structures.

ONE PLANET LIVING: ON GOOD TERMS WITH PLANET EARTH

The ten principles of One Planet Living:	Zero Carbon:	Achieve net CO ₂ emissions of zero from One Planet Living developments
	Zero Waste:	Eliminate waste flows to landfill and for incineration
	Sustainable Transport:	Reduce reliance on private vehicles and achieve major reductions of CO ₂ emissions from transport
	Local and Sustainable Materials:	Transform materials supply to the point where it has a net positive impact on the environment and local economy
	Local and Sustainable Food:	Transform food supply to the point where it has a net positive impact on the environment, local economy and peoples' well-being
	Sustainable Water:	Achieve a positive impact on local water resources and supply
	Natural Habitats and Wildlife:	Regenerate degraded environments and halt biodiversity loss
	Culture and Heritage:	Protect and build on local cultural heritage and diversity
	Equity and Fair Trade:	Ensure that the OPL community's impact on other communities is positive
	Health and Happiness:	Increase health and quality of life of OPL community members and others

Interview with Sumeet Manchanda

For the past 30 years, mankind has been using up more natural resources than the earth can supply. Currently, our environmental foot-print exceeds our planet's carrying capacity by a factor 1.3. But is life in accordance with the planet's resources still possible in the industrialised world of today? According to the founders of the 'One Planet Living' initiative, it is.

The challenge ahead is clear: to support our current life style, mankind would need 1.3 'Planet Earths' rather than just one. For Western Europe and the US, the figures are 3 and 5 planets respectively. But how to reduce one's environmental footprint in a world driven by fossil fuels, urban sprawl, non-returnable packaging and short-lived production cycles?

To demonstrate that a 'One Planet lifestyle' is actually feasible, the British charity BioRegional and the World Wildlife Fund (WWF) have set up the 'One Planet Living' global initiative. BioRegional is working with partners to create community developments throughout the world which demonstrate that life within the resource constraints imposed on us by Nature is possible, and may even be a healthy and happy one. After completing Beddington Zero Energy Development (BedZED) in London in 2002, BioRegional's One Planet Living Programme has extended its activities to other developments in the UK, the USA, South Africa, Portugal, China, Australia and the United Arab Emirates.

D&A How would you describe the vision behind the 'One Planet Living' programme? Is it about housing, about community-building, about local food and materials supply, about alternative mobility patterns, or about all of these?

SM Essentially, it is about all of these. Our work relies a lot on measures such as the ecological footprint and the carbon footprint. Ecologi-

cal footprinting tells us that if everyone in the world lived the way we do in Western Europe, we would need three planets to support us. For people in the US, this figure is five planets. The vision of 'One Planet Living' is that we all need to get to a point where we are living within one planet's resources – and that while doing so, we should still be living healthy and happy lives.

To achieve this vision, BioRegional is developing a series of demonstration projects all around the world. Here, we are aiming to show what 'One Planet Living' looks like in practice. Within their own distinct frameworks, all of these projects are trying to put in place the products, services and infrastructure that make it easy for people to live in a sustainable way. For example, we want buildings to be absolutely zero-carbon. So that part of the person's footprint vanishes without the inhabitants even having to try. In addition, we want to reduce transport emissions as much as possible, for example by introducing electric vehicles. In the United Arab Emirates, we are helping to develop the sustainability strategies for the eco-city of Masdar, planned by Foster and Partners. Here we developed a concept according to which there will be no fossil-fuel based cars or buses in the city, but only electric vehicles powered by renewable energies.

Food accounts for another large part of each person's ecological footprint. To diminish the 'food footprint' we try to put into place facilities such as farmers' markets and food deliv-

ery services, whereby residents can access local, seasonal, low-meat-and-dairy food in a convenient way.

Currently BioRegional is also working with the 2012 Olympic Games in London, trying to get them as close to 'one-planet' games as possible. For example, we are encouraging our partners to ensure that 80 to 90 percent of all transportation to and from the Olympics will be public transportation, such as shuttle buses and light railways, and that the entire built infrastructure will meet our zero-carbon criterion.

D&A Who are your scientific partners in this effort?

SM We work with the Stockholm Environmental Institute (SEI) and the Global Footprint Network. These are both experts in ecological footprinting, and SEI in particular is also an expert in carbon footprinting as well as material flow analyses. Recently, we have also started to develop in-house expertise as both of our partners have become extremely busy with other assignments.

D&A It has often been stressed that for sustainable cities and communities, citizen participation is essential. What is your experience in this matter? Do people really care about their resource use – and the resource use of their homes? And how can their goodwill be converted into good actions?

SM No one sets out to harm the planet. But living in a sustainable manner is

The emirate of Abu Dhabi is planning the first completely CO₂-neutral garbage and automobile-free city of the world – Masdar City. Beside the architects Foster and Partner, BioRegional also participated as a consultant in the planning.



RENDERING: FOSTER AND PARTNERS

far too tough and inconvenient in the present world. We therefore focus on creating places that make the choice of a sustainable life-style an easy one. Our monitoring of the BedZED development, for example, shows that it is possible to live on a level of 1.5 planets, or even at the 'One Planet' level, even in Europe. But the residents can even go on to do much more by setting up their own businesses. One of them has established a farmer's market on site, which in turn also helped other residents to reduce their environmental footprints. Other residents have set up health and yoga clubs, which help improve people's health. Improved health, in turn, leads people to actually use more of the walking and cycling options that are offered to them throughout the neighbourhood. So, yes, the partnership with the residents is absolutely essential.

D&A What can be done to enable people to reduce their environmental footprint? How much can be achieved merely by information and awareness-building, how much by legislation and how much by financial incentives?

SM Recent research shows that raising awareness leads to raised awareness- and not necessarily to changed action. It is important, however, to raise awareness about specific action people can take. There is enough awareness about the problems of the planet, but so far, the focus on what people can do in their day-to-day lives is insufficient. We therefore try to implement targeted awareness

campaigns in our partnerships, and I know a lot of other initiatives that do the same.

On the other hand, legislation can definitely play a huge role. In the UK, for example, zero-carbon homes have been exempt from stamp duty from 2007 onwards, and from 2016 all new homes will need to be zero-carbon. This is an example how legislation has completely changed the debate in the UK.

What I think legislation should not do, however, is to be too prescriptive. It should not try to define the process by which to achieve a certain aim. That tends to hamper the market. If legislation demands that every new building be zero-carbon, and then provides a broad definition of what zero-carbon is, the market will find its own and most efficient route to achieve this goal.

Financial incentives can be very effective. In the UK, for example, programmes have been set up to promote the use of insulation and of the installation of renewable energies, and people are increasingly taking these up very, very quickly. None of this would have been possible without financial incentives. Sometimes the incentives even become obsolete after a few years, because the markets have grown so much that there has been a drop in prices and the amortisation periods for these measures have become shorter.

D&A What influence do patterns of ownership in a neighbourhood have on sustainable development? Do peo-

ple who own their homes and tend to care more for their surroundings?

SM It is definitely easier to convince homeowners, who see the direct savings, to install efficient energy and water appliances. With landlords or developers, who do not necessarily profit from the savings, things are a little different. So, yes, ownership does matter, but we need to find ways to get around that. Currently we are encouraging developers to take a stake in the renewable energy infrastructure of their neighbourhood, and to establish partnerships with the energy supply companies. By doing so they can see long-term returns from the renewable energies they supply. Our developers in the UK, Portugal and the US have already set up this new kind of business model.

D&A Are the projects you support mostly new-built, or do you also work in existing neighbourhoods?

SM We do both. Just a few months ago, we started a massive retrofit project called 'One Planet Living in Sutton', a borough in London. Here we formed a partnership with a company that produces cavity wall and loft insulation. Residents who take part in the scheme can obtain insulation for their homes at really cheap prices – the cheapest I have ever heard of. We are also working with water supply companies to install water meters that make people more aware of their own consumption. To-

The starting signal for the 'One Planet Living' initiative was given with the BedZED project in south London – and until today the office for the initiative is domiciled there. The ecological building method and sustainable energy supply for the settlement planned by Bill Dunster help the inhabitants to reduce their ecological footprint.



PHOTO: RAF MAKDA / VIEW

The site plan of the 'One Planet Living' project at Mata de Sesimbra in Portugal. Green corridors are also meant to uphold the interrelationship of the natural habitats in the area after completion.



gether with the local council, we are trying to find 2–3 sites for very big renewable energy infrastructure such as a 10 MW biomass power plant or a wind facility. Additionally, we are exploring options with the authorities to improve walkability in the borough, improve cycling infrastructure and so forth.

D&A What role do social networks among the residents play in the context of the 'One Planet Living' programme?

SM Social networks do play a huge role. Within each community, focal points are needed, as well as some people who act as leaders and organisers. This very much happens at BedZED, where residents organised their own farmers' market, car-sharing facility and sustainable barbecues, to mention just a few. There is a residents association at BedZED, which people use to start and advertise their own sustainable businesses. In this context, we act as a small business incubator unit, if you like, and this approach is being taken up in our other developments as well.

D&A What can be done by planners and political decision-makers to strengthen these networks?

SM I think the communities ought to be consulted in the planning process of every new community, as well as when important changes happen. Moreover, planners should be capable of laying out scenarios and dis-

playing a long-term vision, as this is vital in getting people to understand why things need to be done in different ways. I recently attended a lecture by Peter Calthorpe, one of the leaders of New Urbanism in the United States. He described how, in his communities, he usually laid out three scenarios of what could happen by 2050. When he did this, he found out that every single time people understand the bigger picture, they choose the more sustainable option. We are now incorporating these consultation and scenario-building processes in our work as well.

D&A One of the ten guiding principles of One Planet Living Communities is entitled 'Culture and Heritage'. What role do they play in sustainable development?

SM A sense of place – and of belonging to it – is critical for people to take action for their living environment. We therefore place a strong emphasis on local culture and heritage. If people understand why the place they inhabit is special, they are more likely to form a bond with that place, and eventually support initiatives to protect it.

There is another issue about place: the whole world is becoming increasingly boring. Whether you go to Shanghai, Washington, Johannesburg or London, the situation is the same. If people did not tell you where you were you would not know; there are the same shops, the same brands, the same cars. That encourages peo-

ple to become more nomadic. We, on the other hand, believe that people have to establish a link to places. We are creating new communities in all of these cities, and we definitely do not want them to be all the same. Therefore, every one of our project managers is from his or her respective country. We simply could not do our work without their understanding of local culture.

D&A How do you measure the quality of living on a city or neighbourhood scale, to make the success of your developments comparable?

SM We do not really focus on comparing. Nor do we create a kind of 'tick box' type of measurement system. We do, however, set up an association in every community that runs an annual survey of people and their happiness. When we conceptualise a new community, we ask ourselves: what would make a child, a construction worker, an elderly couple, happy here? With everyone involved, we ask: why would they be happy living or working in these neighbourhoods, rather than somewhere else? For example, most conventional developments only consist of flats, whereas in our developments there are always community facilities. This may be a crèche, or more play areas than elsewhere suitable for different age groups. For our development in China, we built a sort of open-air theatre for the local opera. This had not been part of the original programme,



but we established it through a workshop we did with the local residents, government representatives, the design team and the developer. Quality of Living is about needs and how they are defined by the individual and by the community. A whole industry (the advertising industry) is based on creating needs that do not exist beforehand, or were not assigned any preference by the people. Can a similar approach be taken to create the need for a sustainable life style?

I think there is an element of 'creating the need', but it is equally important to avoid patronising people and talking down to them. Showing that what you try to achieve is, in fact, common sense, and setting up concrete examples are the best things you can do.

Additionally, we try to create a market for more sustainable products and services, as well as to create an awareness for the negative aspects of existing products. So in some cases we create a need for a new kind of consumption, whereas in others, we try to help people understand that they need to cut out some aspects of consumption altogether.

D&A Environmental experts identify three paths to sustainable development: (Resource) efficiency, consistency of human technologies with natural systems, and sufficiency, that is to say, the question of how much consumption is enough for a decent standard of life. What does the notion of 'sufficiency' mean to you?

SM What matters is that we reach a point where people are truly happy. In our society, consumption is a kind of quest for happiness. For example, people are travelling more and more because they are not happy just remaining where they are. We therefore try to create places where there is a sense of place, where there is no need to travel beyond and go in search of somewhere else. Essentially, this leads me back to our basic philosophy which is to create places where people can lead healthy, happy lives. To me this is the only possible approach to achieving sufficiency. Only if you feel that you have something that is special – a plate of local-grown, organic food, for example, or a shirt of organic-grown cotton – do you start to have a feeling of contentment, and you do not feel the need to go out and buy something else.

D&A How were your 'One Planet Living' projects received in different regions of the world? What challenges did you meet in trying to establish them?

SM With One Planet Living, we deliberately targeted the countries with the highest ecological footprint on every continent: the US, the UK, South Africa, the United Arab Emirates, China and Australia. Within these countries, we focused on the so-called 'aspirational' housing market, which is the segment in which most people aspire to buy their homes, and which, hence, is also the fastest-growing segment. In China,

for example, we focused on the ever-expanding middle income group that wants to live in apartment blocks. The type of people we target is similar. These people consume quite a lot – they make a few flights a year, drive cars and so on. This means that if we succeed in changing this market segment, we will achieve a maximum effect.

We are pleasantly surprised how well people have received our ideas and how much they feel that this is a shared issue between different countries. I have been amazed that when I went to South Africa and China, talked to people about our intentions, they told me that this was exactly the approach they had been waiting for.

In terms of technology and other detail issues, on the other hand, there were great differences. In the United Arab Emirates, the conditions for construction labour became an important issue, whereas in Europe or the US, they did not. Also, in China and South Africa, the Renewables market is less developed than in the US and UK, for example. Therefore, in these countries it is technically much more difficult to achieve a 'zero-carbon' building standard. Obviously, these are difficulties in the details, but overall we have had a much better response than even we had initially hoped for.

Up to 6000 housing units, eight hotel resorts and 186,000 square metres of industrial land are to be developed in the next few years in the Sibaya district of Durban/South Africa. The 'One Planet Living' initiative deliberately selected the country with the highest CO₂ emissions of the continent for its first project in Africa.

Sumeet Manchanda is an architect and development manager with international experience in sustainable planning, building design and construction. He is the Programme Manager for the global One Planet Living network of sustainable communities, managing an international team working in six countries on four continents. Prior to joining BioRegional, Sumeet Manchanda co-managed the construction component of the world's largest primary education programme, building 30,000 new school buildings over six years as part of a World Bank project.

BOOKS

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

GLENN MURCUTT, ARCHITECT

Editors: Michael Tommasi,
Liisa Naar
01 Editions
ISBN 0-9775931-0-X

One of the things said of the Australian architect and Pritzker prize winner Glenn Murcutt is that he values slowness. This is true inasmuch as Murcutt continues to work without using a computer, has no employees and may let a client wait for up to three years before sitting down to the drawing board. But he subsequently makes up for this by creating buildings that leave nothing to chance. Murcutt seamlessly integrates all design parameters in his own unique way. He provides answers to his clients' way of life, the location and its topography, the visual axes and vegetation at the site, the climate, amount of sunlight and the ground conditions, creating an architecture to which nothing more needs to be added and from which nothing can be taken away without disturbing the whole.

This book has much in common with the architect on which it focuses: the editors spent almost five years working on this seven kilogram compilation consisting of a book and eight loose leaf folders. The book's

folio format of 45 × 32.5 centimetres means that 'Glenn Murcutt, Architect' does not make for quick reading. This applies even more to the folders, which document eight key works of Murcutt with a hitherto unknown attention to detail. 128 full-scale sketches and drawings, some of them on tracing paper, in addition to photo-essays with illustrations, some of them 45 × 60 centimetres in size, do more than merely show those details that are easily overlooked in other publications. They also allow the reader to follow Murcutt's mode of working with comments written on the margins of plans and a greyish film on parts of the pencil drawings denoting those areas he repeatedly erased and redrew.

The book has included short texts by Juhani Pallasmaa and the Australian writer David Malouf as well as a 100-plus page, excellently illustrated essay by Kenneth Frampton. It also includes Murcutt's acceptance speech given on the occasion of receiving the Pritzker Prize in 2002 as well as (a facsimile edition of) his correspondence with his clients Mr. and Mrs. Simpson-Lee. For that, too, is part of Glenn Murcutt's method of working: he selects his clients very carefully and often enters into close friendships with them over the years. His preferred clientele are well educated and cultured, aware of their goals in life and enlightened lovers of nature.

What does this book tell us about the architect Glenn Murcutt? Those who have already read other books on Murcutt or who have had the pleasure of attending one of his lectures will find much that is already familiar: a lone figure who has resisted the constant compulsion towards acceleration typical of our time, an architect with a profound knowledge of nature who often seems "more a biologist than an

architect" (Juhani Pallasmaa) and a meticulous designer who has acquired his own archetypal language for many details of construction. Murcutt is also shown as an urbane lecturer touring the world, who nevertheless builds exclusively in Australia because that is the only place where he can maintain a close relationship with his clients. The lightness of Glenn Murcutt's buildings is emphasised, which are also an avowal of his commitment to sustainability, and the reader is treated to a wonderfully poetic description of living in traditional Australian wooden houses (from the pen of David Malouf). But the real attraction of this compilation lies more in its outstanding illustrations than in the texts. The format of the mainly black and white photographs and plans (many of a size usually only seen in exhibitions) and the intelligent selection of the illustrations give Murcutt's work a plasticity as if the reader were able to "look over the shoulder" of the architect during the design process.

A second question remains: who will buy a book which is published in a limited edition of 1000 copies and priced at 1650 Australian dollars (around 1000 Euros)? There can be no doubt about it: this is a collector's price, and as a collector's item for solvent bibliophiles the Murcutt folio is undoubtedly attractive. The editors nevertheless emphasize that the work is actually meant for universities and their libraries. It remains to be hoped that these institutions can and will raise the money, thus making Glenn Murcutt's work accessible to a broader public – particularly to a new generation of architects. And that perhaps the texts of the book will one day find an even bigger interested readership when the texts are made available in a less expensive edition or online.

SUSTAINABLE URBANISM

Urban Design with Nature

Author: Douglas Farr
John Wiley & Sons
ISBN 978-0-471-77751-9

Sustainable Urbanism is based on the insight that our survival as a species does depend not only on how energy efficiently we build and what cars we drive but also, and above all, on our lives and our lifestyles. That fact is that the city and settlement patterns we surround ourselves with and our 'way of life' are very closely linked with each other. Douglas Farr makes this clear at the beginning of his book with some figures from everyday American life: the number of obese Americans has doubled since 1990. At the same time, the USA has over a billion car-parks, and the number of miles driven per person is increasing every year. So we learn from this that sustainable urban and transport planning does not just affect the environment but public health as well.

Until recently, Douglas Farr, an architect and town planner from Chicago, was chairman of the LEED for Neighborhood Development Projects for four years. This is a committee that has devised guidelines and criteria for sustainable urban development in the USA. The wealth of figures, facts and concrete instructions for action that makes his book relate closely to practice derives from his experience in this post. The basic assumption that our housing estates and cities have to become more sustainable is actually no longer news for European town planners and local politicians. But Farr says that this is completely different in the USA: the concept of sustainable development has never been really fully defined in the USA before, nor has a set of instruments for im-

plementing it been devised. And this is precisely what the author sets out to do: he does not just define objectives and transparent criteria for sustainable urban development, but also proposes concrete steps for putting it into practice.

Sustainable Urbanism is aimed at the situation in the USA, but it is still of interest to European readers: Farr succeeds in presenting the enormous challenge the largest economy in the world is facing in all its complexity. Andrés Duany, the doyen of American New Urbanism, also compares Sustainable Urbanism with Christopher Alexander's groundbreaking book A Pattern Language. Duany asserts that both represent the same holistic approach to seeing the city as a tissue of architectural and infrastructural patterns on all levels of scale.

Farr's ideas are also greatly inspired by the ideals of New Urbanism; catchwords like mixed use, density and walkable neighbourhoods constantly crop up in the book. And yet Farr criticises New Urbanism because of its limited scope and its tendency to elitism. He also ascribes similar weaknesses to the existing standards of efficiency in the American building industry, and above all to the 'Leadership in Energy and Environmental Design', which has existed since 1996. The initiative is omnipresent in the media, and there are already over 40,000 LEED-accredited planners. But ten years after the start, the number of LEED-certified buildings was still under 1,000. Giving the USA's annual new volume of 150,000 buildings, this is no more than the veritable drop in the ocean. Farr also points out that, so far, the LEED criteria have focused only on individual buildings, and taken no urban development criteria into account.

Farr's book argues for an integrated view, covering all aspects of

urban development from user involvement in the planning process to road-building and legal regulation of land ownership. Farr is also aware that it will not be possible to change course from one day to the next. He writes, "It took over two generations to create climate-changing sprawl and the interlocking system of finance, land use, transportation, and infrastructure necessary to perpetuate it."

Sustainable Urbanism consists of four chapters. In the first, Farr defines the criteria of sustainable development and devises a strategy for implementing it. The two following sections explore this in greater depth in about 40 contributions by guest authors. Then the final chapter presents 20 case studies of sustainable building projects in America, Europe, Asia and Australia. Here classical instances of 'New Urbanism' like Poundbury in England are set alongside quite un-ideological planning like the Kronsberg district of Hanover. This suggests that urban development will also use quite different images in future in order to give people a home. But style debates and design fashions have very little to do with sustainability. So it is about time less attention was paid to them and more to addressing ourselves to the essentials - again.

THE ROMA JOURNEYS

Authors: Cia Rinne,
Joakim Eskildsen
Foreword by Günter Grass
Steidl Verlag
ISBN 978-3-86521-371-6

For six years, from 2000 to 2006, the photographer Joakim Eskildsen and the author Cia Rinne travelled through Europe and Asia on the trail of the Roma. They visited Roma from

France to India and from Hungary to Finland, lived with them, formed friendships with them and documented their living conditions and ways of life. This book represents the fruits of these labours – a book which is unique in three respects.

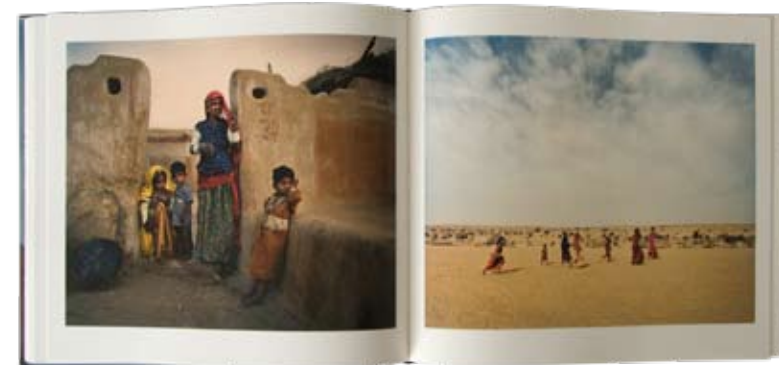
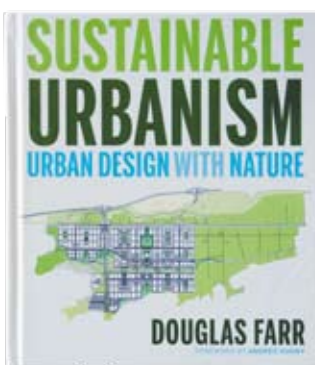
Firstly: the photographs. The more than 240 full page photographs by Joakim Eskildsen show the people the authors met during their travels, with their houses and dwellings, their work, their customs and their family lives. Despite the fact that the authors often portray precarious living conditions, the pictures exert a strange fascination. Only very rarely has a photographer come so close to members of this group, a group which still has to contend with incomprehension and prejudices on the part of many Europeans. Joakim Eskildsen's photographs show a life lived on the margins of society, a way of life which is often under threat and yet is characterised by a strong cultural identity. This sense of identity is always closely linked to the respective place of residence – whether it is a Hungarian peasant village, a French metropolis or a Greek rubbish dump – and often enough a remnant of nomadic life still clings to this way of life. Many of the people portrayed in the book – or at least their ancestors – endured veritable odysseys before they were able to establish themselves in their present place of residence. They have been (and still are) openly persecuted and repeatedly expelled or forcibly resettled, and oftentimes they have to deal with more subtle prejudices of non Roma persons.

Secondly: the texts. Cia Rinne's descriptions are much more than a mere retelling of personal experiences. She recounts the history of the Roma, who began moving out of northwest India in the 14th century, arriving in Europe in several successive waves. She tells how the ances-

tors of today's Roma performed at medieval royal courts as musicians and troops of acrobats, where they were tolerated rather than loved by the rest of the population. She describes how Romani, the Roma language, developed, together with its innumerable ramifications. And she relates her personal encounters with modern day Roma and their struggles for survival: as agricultural labourers, craftsmen, scrap metal collectors, itinerant traders, or even – if the circumstances do not permit anything else – as beggars.

Thirdly: the original recordings. Cia Rinne and Joakim Eskildsen compiled some of the songs and pieces of music of the people they visited in an audio CD included in the book.

The photographs and texts in the book form two separate narrative strands, which repeatedly come together when the story turns to the concrete living conditions of the Roma. The narratives can be 'read' in parallel or separately, but they nevertheless have a lot in common: a keen power of observation with an eye for details, empathy and respect for the persons being portrayed and their culture, but also a healthy measure of matter-of-factness. Both the photographs and the texts show that the authors no longer experience the Roma's way of life as foreign or exotic but as familiar terrain. Cia Rinne and Joakim Eskildsen have managed to portray the lives of Roma 'from the inside', which is more than many books on the same subject can say of themselves.



BOOKS

RECOMMENDATIONS

European architects recommend their favourite books in D&A.



1 PIETRO CARLO PELLEGRINI RECOMMENDS

La solitudine degli edifici e altri scritti

Author: Rafael Moneo
Umberto Allemandi & C.
ISBN 88-422-0923-6 (Vol.1)
ISBN 88-422-1064-1 (Vol.2)

Rafael Moneo, the Pritzker prize-winner of 1996, belongs to a generation of architects for whom theory and a consideration of things theoretical are just as important as designing actual buildings. This two-volume work is a collection of his own writings which, over the years, he has composed for magazines or presentations. Volume 1 contains essays on typology, the theory and history of architecture and the role of technology in architecture. In Volume 2, Moneo analyses the way in which other great architects of today work – from Ieoh Ming Pei to Peter Eisenman and Robert Venturi.

J.A. Coderch de Sentmenat, 1913–1984

Editor: Carles Fochs
Editorial Gustavo Gili
ISBN 84-252-1418-1

'It is not geniuses we need now' is the title of a much-quoted essay published by the Catalan architect José Antonio Coderch de Sentmenat in 1961 in 'Domus'. Coderch, a member of Team X, was known for his unpretentious architecture, which had its roots in life. The book takes a look at an exhibition in Barcelona in 1988 and shows the complete life's work of the architect. The monograph on his work is supplemented with essays on Coderch's life and achievements, including some by Ignasi de Solà-Morales and Ricardo Bofill.

L'Architettura della Città

Author: Aldo Rossi
ISBN 88-7005-374-1

With this book that he published in 1966 at the age of 35, Aldo Rossi created the theoretical foundations for his later creative oeuvre. In a time when modernism was thought by contemporaries to have used up all of its credit, Rossi argued that architecture should be considered as a part of the city and its grown structures. Although the 'Architecture of the City' has lost some of its influence since the end of postmodernism, Rossi's consideration of the city as the location of the "collective memory" of its inhabitants is still topical today.

Parallax

Author: Steven Holl
Birkhäuser Verlag
ISBN: 978-3-7643-6436-6

Although 'Parallax' was published for the first time as early as 2000, the book continues to be the most profound analysis ever of the work of Steven Holl – written by the architect himself. Holl's method of working is highly conceptual. In 'Parallax', sketches and texts prevail over photographs of constructed buildings. Holl writes about 15 projects, using short texts called 'liner notes' in which he explains their central themes. Their titles are as unusual as they are informative, ranging from 'The Chemistry of Matter' to 'The Pressure of Light' and 'Porosity', which, for example, manifests itself in Holl's student residence at MIT in Cambridge, USA.

2 DOS ARCHITECTS RECOMMENDS

Constructing Architecture

Author: Andrea Deplazes
Birkhäuser Verlag
ISBN-10: 3-7643-7190-0
German edition: *Architektur konstruieren*. ISBN 3-7643-7313-X

Systematically structured and organised didactically, this book of over 500 pages presents basic technical and architectural knowledge for students and people who are just starting their careers. The focus always remains on how to get from the original idea for a design to the actually constructed building. For this reason, the numerous sketches and detailed sections are supplemented with interesting articles on the history and theory of architecture which examine architectural elements and different modes of construction. The book is divided into the chapters Raw Materials (Module), Components (Elements), Building Methods (Structures) and Buildings (Examples). The systematic approach of these chapters reflects the way in which a project comes into existence.

Continua:

Architectural Screens and Walls

Author: Erwin Hauer
Princeton Architectural Press
ISBN 1568984553

'Continua' documents the unusual but little known work of the Austrian sculptor Erwin Hauer, whose geometrical, perforated walls and screens are just as much works of art as they are architectural elements. In the 1950s, Hauer's unconventional structures on the buildings of Philip Johnson, Florence Knoll and other representatives of American modernism excited a great deal of interest from the media. In the meantime, they have been almost completely forgotten and many of them have already been torn down. Now, 'Continua', with its series of impressive photographs, brings back to life many of the works of Hauer, who worked as a professor at the Yale University School of Art for many years.

The Architecture of Happiness

Author: Alain de Botton
Hamish Hamilton Ltd
ISBN 0241142482

One of the most important but frequently forgotten influences on well-being and unease is the built environment in which most people spend all their lives. In an easy-to-understand and entertaining book, Alain de Botton examines how architecture talks to us and how it affects all aspects of human life. Whereas many architects shrink back from the word 'beauty', de Botton asks the seemingly naive question: "What is a beautiful building?" and thus makes it the starting point of an excursion into the philosophy and psychology of architecture. In 'The Architecture of Happiness', architecture is astutely presented as a part of human life.

Invisible Cities

Author: Italo Calvino
Harvest Books
ISBN: 0156453800

In his book, which is a fictitious discussion between Marco Polo and Kublai Khan, Italo Calvino proves himself to be the master of the fable. But like any fable, the book also has something to say about reality. The conversation of the Chinese emperor and the widely travelled Italian merchant is about cities between Europe and 1001 nights. In fragmentary but impressive images, Marco Polo portrays human settlements which have never actually existed: cities without walls and roofs, cities made of woven strips of material, cities consisting completely of glass and alabaster. In the end, 'Invisible Cities' can also be read as a manifesto against the often maintained interchangeability of the places where people live.

3 ROMUALD LOEGLER RECOMMENDS

Architecture Now!

Author: Philip Jodidio
Taschen Verlag
ISBN: 3-8228-4091-2

Philip Jodidio (*1954), internationally renowned as one of the most popular writers on the subject of architecture, is an art historian and economist; he was editor-in-chief of the French journal 'Connaissance des Arts' (1980–2002). 'Architecture Now!' is a publication happily coinciding with the 25th anniversary of the formation of Taschen. Beautifully edited and illustrated, it is a cross-section review of existing projects, but also includes examples of experimental architectural ideas. 35 architects and practices are presented on more than 350 pages, each represented by only one project.

Architektur der Erinnerung

Authors: Gunter Schlusche, Carolin Schonemann, Christian Schneeeggass
Nicolaische Verlagbuchhandlung GmbH, Berlin
ISBN: 3-89479-352-X

In this publication, Gunter Schlusche presents examples of projects that are 'architecture of memory' – the most significant monuments and memorial sites built in recent years in Europe. On 180 pages, 50 projects from 20 countries are presented, including some that are still in their concept stages. The presentation is accompanied by extensive visual material and text. The publication is available in German only.

Architecture of Sound

Author: Paweł Kraus
RAM Publishing Company, Krakow
ISBN: 83–918072-5-8

Paweł Kraus, an art historian and critic of architecture, tells the story of the redevelopment of the Artur Rubinstein Philharmonic Hall in Lodz. This new urban intervention, based on a design selected in a competition, replaced the historical 19th-century building and has become the city's new landmark. Analysing the spatial relations in the building and the acoustic technologies used, the author takes a look at the characteristic features of the architect's work methodology. The surprising dynamics of the spatial layouts within the building endow the expression "architecture of sound" with more than just a metaphoric dimension. The book is available in Polish and English.

'Small Houses' and 'Small City Houses' Series

Author: Simone Schleifer
Taschen Verlag
ISBN: 3-8228-5143-4
ISBN: 3–8228–4176–5

These books offer a selection of original, imaginative projects, representing the current urban, suburban and rural living spaces. Apart from a variety of styles and programmatic requirements, all of them have something in common: reduction to what is truly necessary in a house, generated through limited square footage. Unique projects, created by world-famous designers, have been selected to reflect the new ways of inhabiting and experimenting with distribution, materials, textures and light. These projects are examples of interior micro-urbanism, of how design can mould a space to make it personal, functional and aesthetically pleasing.

DAYLIGHT & ARCHITECTURE

ISSUE 09
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Giambattista Nolli:
Map of Rome, 1748

