In a time when human technology is nearing the microscopic level in scope and the inhuman in precision, building a house has remained a comparatively rough and unprecise undertaking. Compared to other materialisation processes that are completely computer-controlled, architecture is still a process carried out by people, as it has always been. Our living environments are conceived, built, financed and lived in by people. Ambitions, fears, changes, dreams, frustrations, conflicts and harmonies are decisive elements of the process of building, and part of the life of buildings themselves.

Architecture has always to address the most contradictory of extremes. It has to shuttle between invention and tradition, between the need for the new and the fear of the new. It has to cater for the unforeseeable: for growth and shrinkage of built-up environments as well as for changes in use and in the dweller’s mindset. If there is something that could be described as architecture of the information era, it is a construction that is not considered as finished when the building process ends; it is architecture where information about the future life and use of buildings is fed back into the design process.

One of the obvious efforts of our societies is the assurance of our future in the present. Foreseeing our personal and social future is one of the most important economical – and ecological – factors, and our living environments are a main feature of our intimate feeling of security. Architecture seems more than ever to be a prospective task, rather than a technical one. At the peak of technological progress, mankind is close to developing an artificial nature that echoes the nature from which it evolved; machines are very close to becoming ‘animated’ and our natural bodies are increasingly subject to a process of artificialisation; becoming humanoid. Our computer networks are affected by viruses similar in effect to those that invade us. At the same time, we have recognised, after many decades of destruction, the fragility and complexity of our own origins.

In a time where innovation is essential for any practice to survive the pressure of globalisation, architecture cannot be regarded as a mere technical service. Let us understand the act of building as an act of continuous improvement, as a manifestation of human inventiveness and ingenuity; the translation of the incredible complexity of our world into building practice. As it has always been.
In this issue of Daylight & Architecture we invite you on a journey through the ‘natures of dwellings’ and present different angles on the theme of our living environments – housing.

As individuals, we all have relations to housing, so this theme is relevant to us in a very basic sense. Beyond that, knowledge and understanding of the development of how people have lived throughout time and in different parts of the world, and therefore building traditions and trends, are essential to VELUX.

As an international manufacturer of roof windows and skylight systems, it is important for us to seek out and strengthen the relevance of our products to architecture. VELUX wants to play a role by contributing and stimulating aspects that lead to better living environments and we want to strengthen and encourage the role of daylight in design prioritising. This focus is our platform for building and nurturing relations with architecture. It is our intention to raise questions and thereby facilitate the discourse on architecture through promoting the use of daylight and better living environments rather than to pose answers and statements that are predictable and take us nowhere.

This objective is the platform from which we present Daylight & Architecture. In this magazine – and the issues to come – we seek to bring topics and present views and angles about the past, present and future of architecture with daylight, fresh air and thereby provide a platform for dialogue between professionals. It is our intention to raise questions and thereby facilitate the discourse on architecture through promoting the use of daylight and better living environments rather than to pose answers and statements that are predictable and take us nowhere.

Enjoy your read and please visit www.VELUX.com/da for further inspiration and information.

**Now**

Start of the season in the Ice Hotel in Quebec, Canada. Tints and carpets that react to daylight. A ‘meaningful’ façade by Diener & Diener in Malmö. And The Traumbau (= Dream Tree), a kindergarten in Berlin, has been converted by the student group calling themselves Baupiloten (= Building Pilots).

**Mankind and Architecture**

**Architecture by the People**

The Austrian Bernard Rudofsky (1905-1988) is regarded as the re-discoverer of vernacular architecture. His essay Architektur ohne Architekten (Architecture without Architects – A Short Introduction to Non-Pedigreed Architecture) has not lost any of its relevance in the 40 years since it was first published.

Clothes make houses – this at least applies to Hapeland, the hedge island in Ypenburg in the Netherlands, with its 119 apartments from MVRDV in Ljubljana, Dekleva & Gregoric have built a holiday home for an older couple from the country. And on the banks of Lake Müliär, Thom & Videgard Hansson have re-interpreted the typical wooden red Swedish house in a surprising manner.

**Reflections**

**Negotiate my boundary!**

In housing construction, architects and clients usually have to depend on experience and rules of thumb when they want to get an idea of the needs of the future occupants. But there is another way of going about this, ‘Negotiate my boundary!’, the five young architects calling themselves RAMTV design a scenario in which the buyers themselves determine the use, the form and the size of their homes.

**VeLUX INSIGHT**

**Suburban Jigsaw Puzzle**

A health social mix is the beginning and the end of many current housing projects in the Netherlands. In the SWANLA estate in Zeeenhuizen, the architects Drost + van Veen have not only created a living space for almost all social and age groups but have also given the occupants the opportunity to extend their homes themselves at a later date.

**VeLUX PANORAMA**

Clothes make houses – this at least applies to Hapeland, the hedge island in Ypenburg in the Netherlands, with its 119 apartments from MVRDV in Ljubljana, Dekleva & Gregoric have built a holiday home for an older couple from the country. And on the banks of Lake Müliär, Thom & Videgard Hansson have re-interpreted the typical wooden red Swedish house in a surprising manner.

**VeLUX PANORAMA**

The person and his habitat, the earth: this symbiosis has not always been characterised by harmony everywhere. Jaime Salazar and Jakob Schoof describe how people made the world habitable and what human living could look like in future urban life close to nature, manufactured and sickly but simultaneously individual, and capable of adapting itself to changing uses and family sizes.

**VeLUX PANORAMA**

VeLUX Editorial WELCOME TO DAYLIGHT & ARCHITECTURE MAGAZINE BY VELUX

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A changing group of architecture students at the Technical University in Berlin call themselves ‘the construction pilots’. With limited resources and under the guidance of two independent architects, Susanne Hofmann and Martin Janekovic, they brought about the transformation of the ‘Dream Tree’ day-care center in Berlin-Kreuzberg. As with all their projects, the construction pilots aimed to combine architecture with social needs: The conversion project is set to improve quality of life in a socially problematic part of the city.

The central element of the transformation is the ‘Dream Tree’, which is a construction made from plasterboard and highly reflective stainless steel in the central atrium. The dream tree captures the imagination of the children, promotes communication and offers various chill-out possibilities: It can twinkle, light up and produce sound. ‘Dream flowers’ grow from the ‘trunk’ alongside a type of sitting basket and radiant ‘silver leaves’, which branch out from the ground floor to the upper floor. A child can sit here and swing to and fro surrounded by the backlit green, blue, yellow or orange dream flowers. Some of the leaves produce comforting ‘snores’. If the children move the rocking branch, it ‘laughs’.

The leaves cast reflections onto the internal passageways in various ways. The concept is designed for three different scenarios: In winter, the leaves catch the light in the entrance area and cause the leaves on the ceiling of the passageways at basement level to glisten. In spring and summer, the light moves along the passageways through the atrium and bathes it in sparkling light. Additionally, there are six reflective ‘daytime leaves’ around the glass roof, which cast sunlight on the atrium floor throughout the year.

Malmo also learns how many of the world’s towns currently appreciate being near to water: harbours become populated areas, or – in the case of ‘Malmo Lärarhögskolan’ - educational establishments for prospective teachers. The new construction, named ‘Orkanen’ (The Hurricane), was designed by the architects Diener and Diener from Basel. The construction, which is not far from the central railway station and was inaugurated in the autumn, fools the visual habits of the observer. Depending on the angle and position of the sun, the five-story glass façade either reflects the blue of the sky or lets the brown clay, which is softened with the green hues of the insulating layers behind it, shine through. 12 millimeter thick cast glass with a prismatic surface structure (type ‘Raywall’) was used. It is fastened with point holders to the facade of the brickwork. This viewer does not even have to change location to experience the optical effect: due to the lightly zigzagged shape of the façade, the reflective and translucent glass surfaces can always be seen in one glance. Letters made of gleaming metal are visible from behind the structural glass. These letters always make up the same word, in different languages: Freedom – Freiheit – Vrijheid – Frihed – Inkululeko. An illusion of the architects’ design? They write about their new construction: “It is a building without traditional hierarchies [...]. The individual areas are put together successively, only the main library covers all tracts and takes hold of the whole building.” This is also noticeable on the façade with its alternating window heights, which can vary to 5 metres high. At first glance, this is exclusively dictated by functional necessity. However, a closer look changes the overall picture seen through it.
It was in his graduate architecture thesis on bamboo that Abinadi Lahh came up with the idea of developing a product which was later to become known as SensiTiles. Lahh came up with the product in the form of a bamboo forest which he describes as a walk through a bamboo forest that sets the delicate bamboo stalks in motion, creating an environment that gently and quietly responds to the human movement.

SensiTiles create a similarly dynamic effect in tiles that can be applied to a variety of surfaces, from exterior pavements, façades, fountains and swimming pools to interior countertops, table tops and walls. The tiles are reactive to changes in light intensity and colour. They dynamically ripple and shimmer in a way that is (according to the manufacturer, SensiTiles Systems) “dramatic, sublime and unlike any other tiles on the market.”

Comprised of a light conducting matrix and a substrate with which that matrix is embedded, SensiTiles transport light from one surface point to another by total internal reflection, the same principle by which fibre optics work. SensiTiles either respond to the absence of light (i.e. shadows) or an active and moving light source. In the first case, SensiTiles cause any shadows that fall on their surfaces to shift. In the case of the latter, they redirect and scatter any incoming light. In an environment with ambient light such as daylight, shadow-producing movements around a SensiTile will produce a rippling effect. In darker environments beams of light are redirected to emerge from another part of the surface.

If colored light falls on a SensiTile, echoes of that colour are dispersed throughout its surface. Multiple colors become blended, rearranged and scrambled. Because SensiTiles are inherently thin, no power is required, the light effects are created passively from external light sources and they last as long as the material does.

The doors of the ‘Ice Hotel Québec-Canada’ will remain open until 2 April. In what is now its sixth season, the temporary building welcomes its guests with 32 rooms and themed suites and with indoor temperatures of scarcely above freezing. It is based on the ice hotel in Jukkasjärvi in the North of Sweden. The founder of the Ice Hotel Québec-Canada and pioneer of Canadian eco-tourism, Jacques Desbois, studied the architecture of the Swedish Ice Hotel in detail before finally implementing his idea in winter 2000. The surface areas of the hotel has grown from 1,000 m² in the first winter to 3,000 m². The structure consists of 32,000 tons of snow and 400 tons of ice and features rooms up to 5.4 metres high. Since 2000, approx. 205,000 people have visited the ice hotel, about 11,000 of whom spent a night in one of its rooms, which cost upwards of 1,999 Canadian dollars per night. Every year in April, the hotel ceases trading and begins to melt, only to be reconstructed in late autumn of the same year. So you can’t get bored with it, the interior decoration is simply modified from year to year. The ice hotel doesn’t only contain beds and settees, but also a chandelier made from ice with integrated optical fibres.

Light can change the appearance and atmosphere in a space. However it is unique that a surface reacts to daylight to such an extent as in ‘Wallpaper by Shadows’ by Swedish designers Front Design. The wallpaper is plain white under artificial light. But as soon as it is illuminated by the sun, violet silhouettes from lamps and other household appliances appear on it. ‘Wallpaper by Shadows’ is part of Front Design’s ‘Design by...’ series, in which they portray the effect that human actions and natural influences have on the shape of objects. Among other things the series includes a chisel which was cast in the mould of an explosion crater, a vase which seems to be constantly about to fall to the floor, and a standard triangle which is sitting up. If people enter the room and lays down again when they leave. The light also has a significant part of the ‘construction programme’ for the new internal architecture. Glass walls separate the offices and meeting rooms from the corridors, and at the same time allow daylight to penetrate the office floors. The walls between the offices and the halls are made of multitranslucent glass with green, printed stripes as blades. In the central zone, the dividing walls are constructed in the same way, but the spaces between the panes are filled with green plastic honeycombs. The translucent honeycombs, which were specifically manufactured for this project, give the surfaces a graphical structure which changes according to the point of view of the observer. When left behind, they dissolve in a flurry of lines and surfaces. This conveys the perception of measurements and distances and only provides a dim outline of the employees.
Mankind as the focal point of architecture: interior views of a corresponding relationship.

Text by Bernard Rudofsky.
Photos by Yoshio Komatsu.

Architecture without Architects – A Short Introduction to Non-Pedigreed Architecture was the name given by the Museum of Modern Art New York to the exhibition on the research work of the architect Bernard Rudofsky, in 1964. In the following piece, taken from the exhibition catalogue, Rudofsky introduces the reader to a fascinating topic which is as relevant today as it was in the past.

Architectural history, as written and taught in the Western world, has never been concerned with more than a few select cultures. In terms of space it comprises but a small part of the globe – Europe, stretches of Egypt and Anatolia – or little more than was known in the second century a.d. Moreover, the evolution of architecture is usually dealt with only in its late phases. Skipping the first fifty centuries, chroniclers present us with a full-dress pageant of ‘formal’ architecture, as arbitrary a way of introducing the art of building as, say, dating the birth of music with the advent of the symphony orchestra. Although the dismissal of the early stages can be explained, though not excused, by the scarcity of architectural monuments, the discriminative approach of the historian is mostly due to his parochialism. Besides, architectural history as we know it is equally biased on the social plane. It amounts to little more than a who’s who of architects who commemo-
rate power and wealth; an anthology of buildings of, by, and for the privileged – the houses of true and false gods, of merchant princes and princes of the blood – with never a word about the houses of lesser people. Such preoccupation with noble architecture and architectural nobility to the exclusion of all other kinds may have been understandable as late as a generation ago, when the relics and ruins of ancient buildings served the architect as his sole models of excellence (to which he helped himself as a matter of course and convenience). But today, when the copying of historical forms is on the wane, the rest of his life to viticulture and left the task of building to his sons. The Bible mentions (Genesis ix: 17) that Adam’s son Cain built a city and named it after his son Enoch. A one-family town, delightful as it sounds, is a most extravagant venture and surely was never repeated in the course of history. If it proves anything, it illustrates the breathtaking progress made within a single generation, from the blessed hummingbird existence in well-supplied Paradise to the exasperatingly complicated organism that is a town. Sceptics who dismiss Enoch as a chimera will find more significance in the Ark, particularly in view of the fact that it was commissioned by the Lord Himself and built to His specifications. The question whether the Ark ought to be called a building or a nautical craft is redundant. The Ark had no keel, the keel being an intellectual invention of later days, and we may safely assume that ships were not known as yet, since their existence would have defeated the very purpose of the Flood. When Noah landed on Mount Ararat he was 601 years old, a man past his prime. He preferred to devote the rest of his life to viticulture and left the task of building to his sons. The Bible mentions (Genesis ix: 17) Shem’s huts – probably put together with some of the Ark’s lumber – but the decline in architecture was sealed.

The impious who prefer to turn to science in their quest for the origins of architecture will have to swallow a few indigestible facts. For it seems that long before the first enterprising man bent some twigs into a leaky roof, many animals were already accomplished builders. It is unlikely that beavers got the idea of building dams by watching human dam-builders at work. It probably was the other way. Most likely, man got his first incentive to put up a shelter from his cousins, the anthropomorphous apes. Darwin observed that the orang in the islands of the Far East, and the chimpanzees in Africa, build platforms on which they sleep, “and, as both species follow the same habit, it might be argued that this was due to instinct, but we cannot feel sure that it is not the result...
of both animals having similar wants, and possessing simi-
lar powers of reasoning." Untamed apes do not share man's
urge to seek shelter in a natural cave, or under an overhang-
ing rock, but prefer an airy scaffolding of their own making.
At another point in The Descent of Man, Darwin writes that
"the orang is known to cover itself at night with the leaves of
the Pandanus", and Brehm noted that one of his baboons
"used to protect itself from the heat of the sun by throwing a
straw-mat over its head. In these habits," he conjectured, "we
probably see the first steps towards some of the simpler arts,
such as rude architecture and dress, as they arise among the
early progenitors of man." Suburban man falling asleep near
his lawn mower, pulling a section of his Sunday paper over
his head, thus re-enacts the birth of architecture.

Yet even before men and beasts walked the earth, there
existed some kind of architecture, coarsely modeled by the pri-
meval forces of creation and occasionally polished by wind
and water into elegant structures. Natural caves, especially, hold
a great fascination for us. Caves, having been among man's
earliest shelters, may turn out to be his last ones. At any rate,
they were chosen with great foresight as depositories for our
most precious artefacts – government and business files. It is of
course not within the scope of this exhibition to furnish a cap-
sule history of non-pedigreed architecture, nor even a sketchy
typology. It merely should help us to free ourselves from our
narrow world of official and commercial architecture.

Although such arts have long been appreciated in the West-
ern world – not, however, without being cautiously dubbed
'primitive' – exotic architecture (the word exotic is here used in
its original meaning, alien) has evoked no response and is still
relegated to the pages of geographic and anthropological mag-
azines. Indeed, apart from a few regional studies and scattered
notes, no literature exists on the subject. Lately though, ever
increasing, a book, or a piece of music. Innocent as we are of this sort
of planned parenthood in the field of urbanistics, we exhaust
ourselves in architectural proliferation. Our towns, with their
air of fertility, grow unchecked – an architectural eczema that
defies all treatment. Ignorant as we are of the duties and privi-
leges of people who live in older civilizations, acquiesce as we
do in accepting chaos and ugliness as our foreordained
fate, we neutralize any and all misgivings about the inroads of architecture on our lives with lame protests directed at
nobody in particular.

Part of our troubles results from the tendency to ascribe
to architects – or, for that matter, to all specialists – excep-
tional insight into problems of living when, in truth, most of
them are concerned with problems of business and prestige.
Besides, the art of living is neither taught nor encouraged in
this country. We look at it as a form of debauch, little aware
that its tenets are frugality, cleanliness, and a general respect
for creation, not to mention Creation.

To no small degree, this situation came about through the
diligence of the historian. By invariably emphasizing the
parts played by architects and their patrons he has obscured
the talents and achievements of the anonymous builders, men
whose concepts sometimes verge on the utopian, whose esthet-
ics approach the sublime. The beauty of this architecture has
long been dismissed as accidental, but today we should be able
to recognize it as the result of rare good sense in the handling
of practical problems. The shapes of the houses, sometimes
transmitted through a hundred generations, seem eternally
valid, like those of their tools.

Above all, it is the humaneness of this architecture that
ought to bring forth some response in us. For instance, it sim-
ply never occurs to us to make streets into oases rather than
deserts. In countries where their function has not yet deteri-
orated into highways and parking lots, a number of arrange-
ments make streets fit for humans: pergole and awnings (that
is, awnings spread across a street), tent-like structures, or per-
manently open for ventilation and

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tional insight into problems of living when, in truth, most of
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The Austrian architect Bernard Rudofsky (Vienna 1905 – New York 1998) worked as a consultant to the Museum of Modern Art New York in the 1960s. During his many research trips and in his studies all round the globe, he documented informal houses, residential buildings and settlements which cannot be classified in the classical canon of architecture. Rudofsky was considered a sarcastic critic of western architecture. As a visionary and pioneer, he recognised the artistic and cultural wealth of traditional peoples who were disrespectfully referred to as ‘primitive’.

Africa and Asia, arcades are a common sight because they also have been incorporated into ‘formal’ architecture. Bologna’s streets, to cite but one example, are accompanied by nearly twenty miles of portici.

Another alien type of the communal vernacular is the storehouse for food. In societies where food is looked upon as a divine gift rather than an industrial product, the architecture of granaries is solemn. So much so that to the uninitiated it suggests ecclesiastical buildings. Although small in scale, storehouses achieve monumentality, whether in the Iberian peninsula, in the Sudan, or in Japan. In view of their great stylistic purity and precious content, we have termed them quasi-sacral.

Apart from the High Vernacular – the sophisticated minor architecture of Central Europe, the Mediterranean, South and East Asia – and primitive architecture proper, the exhibition also includes such categories as architecture by subtraction, or sculpted architecture, exemplified by troglodyte dwellings and free-standing buildings cut from live rock and hollowed out. Rudimentary architecture is represented by wind screens which sometimes attain gigantic dimensions. In Japan they may shield, indeed, envelop a house, a hamlet, or an entire village. Of the architecture of nomads, portable wind screens which sometimes attain gigantic dimensions.

Left Indonesia: The houses of the Bajoe on the coast of the island Sulawesi are made of mangroves. The roofs are covered with palm leaves. The people live from the cultivation and sale of sea algae.

Opposite Turkey: pointed rocks characterise Cappadocia’s landscape. The rock is of volcanic origin and is therefore soft and easy to shape. There are fewer and fewer people living in the houses cut out of the rocks. In the fourth and fifth century, the main settlers here were Christian monks.

There is a good deal of irony in the fact that to stave off physical and mental deterioration the urban dweller periodically escapes his splendidly appointed lair to seek bliss in what he thinks are primitive surroundings: a cabin, a tent, or, if he is less hidebound, a fishing village or hill town abroad. Despite his mania for mechanical comfort, his chances for finding relaxation hinge on its very absence. By dint of logic, life in old-world communities is singularly privileged. Instead of several hours of daily travel, only a flight of steps may separate a man’s workshop or study from his living quarters. Since he himself helped to shape and preserve his environment, he never seems to tire of it. Besides, he is largely indifferent to ‘improvements’. Just as a child’s toys are no substitute for human affection, to him no technical contrivance makes amends for the lack of viability.

Not only is the need for confining the growth of a community well understood by the anonymous builders, it is matched by their understanding of the limits of architecture itself. They rarely subordinate the general welfare to the pursuit of profit and progress. In this respect, they share the beliefs of the professional philosopher. To quote Huizinga, “the expectation that every new discovery or refinement of existing means must contain the promise of higher values or greater, happiness is an extremely naive thought…. It is not in the least paradoxical to say that a culture may founder on real and tangible progress.”

The present exhibition is a preview of a book on the subject, the vehicle of the idea that the philosophy and know-how of the anonymous builders presents the largest untapped source of architectural inspiration for industrial man. The wisdom to be gained from them will ultimately contribute to the realization of a community ever more free from the trammels of modern life.
LIVING ENVIRONMENTS

The past, present and future of human dwellings – and the professional dialogue in which they are created.

There is no place that reflects our personality as closely as what we call ‘home’. Its basic functions – both physical and psychological – have remained virtually unchanged over the centuries, but its design and construction have become a task for professional architects and builders. It is a demanding task, as Jaime Salazar and Jakob Schoof argue in their article, which demands not only close cooperation between all those involved in the planning process, but also – possibly – new paradigms for the planning itself.

Following spread

Apartment blocks in Hong Kong’s suburbs. A shortage of development land and an ever increasing population density led to population densities of up to 8 000 residents per hectare. The apartment blocks with the euphemistic name ‘Harmony Blocks’ rise tightly packed on foundations which are several storeys high and have roofs designed as theme parks.

Right Fritz Lang: Metropolis (Germany 1926). In his Science Fiction film, Fritz Lang paints the sinister futuristic picture of a society which manifests itself in the capital Metropolis where technology has gone awry. The upper class lives in almost paradise-like conditions while the labourers are considered inferior and vegetate in a type of underworld in the bowels of the earth.
THE NATURE OF DWELLING

One of the most famous illustrations of the origins of architecture is a woodcut print from the 17th century. It depicts a scene where a man is building a house from the ground up. This image is often cited as evidence for the idea that humans have been building houses from the beginning, as a natural part of our existence.

Since antiquity, after prominent philosophers like Aristotle and Plato, architecture has been considered as a means to express the values of a society. In the Renaissance, architects like Filippo Brunelleschi and Leonardo da Vinci explored the principles of classical architecture, and in the modern era, architects like Le Corbusier and Frank Gehry have pushed the boundaries of what architecture can be.

The nature of dwelling is not just about the physical structure of a building, but also about the way we live in it. The modern concept of the "habitation" is based on the idea that a dwelling should be a place where we can find comfort and a sense of belonging. This concept has been further developed by architects like Louis Kahn and Frank Gehry, who have created buildings that are not just functional, but also beautiful and meaningful.

The nature of dwelling has also been explored in more recent times, with architects like Zaha Hadid and Rem Koolhaas creating buildings that are not just functional, but also artistic and thought-provoking. These architects have pushed the boundaries of what architecture can be, creating buildings that transcend the limitations of traditional design.

The nature of dwelling is still being explored today, with architects like Bjarke Ingels and OMA creating buildings that are not just functional, but also sustainable and environmentally friendly. These architects are using new materials and technologies to create buildings that are not just physical spaces, but also environmental systems.

In conclusion, the nature of dwelling is a complex and multifaceted concept that has been explored by architects throughout history. It is not just about the physical structure of a building, but also about the way we live in it, and how we interact with the world around us. As the world continues to change, the nature of dwelling will continue to evolve, and architects will play a key role in shaping this evolution.
According to his website, 'coming from a modest background, Kinkade emphasizes simple pleasures and inspirational messages through his paintings'. His paintings of traditional villages and old cottages are so popular that they have even become a paradigm for a 'real' settlement (see page 22).
Shelter during the night. 1.7 percent of its inhabitants are with-
which is ‘the world’s most livable city’, contrary to the originals, Jakriborg has
down to the smallest details, however, Swedish Jakri AB in the densely popu-
interpretation of a medieval Hanseatic
1999). Jakriborg is a contemporary re-
were based on the cottages in his paintings. 7–8. The Village at Hiddenbrooke, Cal-
from the elements, and a commodity that
and a transportation network
many others named from country to country, but are
valuation as their modernist counterparts did.
points of criticism against
nection between ‘house’ and ‘home’ that we
standards, New Urbanism restricts the individual
A new urban centre in the style
Citadel Broekpolder in Heem-
their work has been concerned with the construction of
happy memories in buildings whose iconog-
aff ordable housing and market-rate housing;
 producción architecture to provide us with a

We seek security, reliability and

success by trial and error, can be replaced by masterplan-

speech by HRH the Prince of Wales explains

the Truman

John Ruskin, 1865

JOHN RUSKIN, 1865

Architectural Review 1/1994

Domicile, published in: Arkkitehti – Finnish

London 1981

Speech by HRH the Prince of Wales on

Vincent Scully Prize, November 3, 2005

Domicile, published in: Arkkitehti – Finnish

THIS IS THE TRUE NATURE OF HOME – IT IS THE PLACE OF PEACE.

JOHN RUSKIN, 1865
residential complexes. Room service in a high-rise apart-

INTERVIEW WITH ALEXANDER ASADOV

Mr. Asadov, in your essay “The Brittle Life of Spaces” you pub-

lished on your homepage, you wrote: “The potential for cli-

mate adaptation for the mass production of buildings has al-

ready been explored. As such, it follows that the purchase of

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attached to jetties or boats turns looking like a crystal. A platform tetrahedrons which make the dwell-wall structure consists of regular unit for three to four persons. The is a modular, light, low-cost living Platform (1999). N55’s Spaceframe ways into the garden in summer to on tracks which can be pushed side-ways into the garden in summer to free up the patio for either uses.

15. Kalhöfer – Korschildgen: Fahrt ins Grüne, Remscheid (1997). The clients – both journalists – wished to add another study to their Tim-bar-framed house. Gerhard Kalhöfer and Stefan Korschildgen designed a mobile and light-weight unit on tracks which can be pushed sideways into the garden in summer to free up the patio for other uses.

16. N55: Spaceframe & Floating Platform (1999). N55’s Spaceframe is a modular, light, low-cost living unit for three to four persons. The wall structure consists of regular tetrahedrons which make the dwelling look like a crystal. A platform attached to jetties or boats turns Spaceframe into a floating island.

The search for a ‘cell’ or capsule that constitutes the smallest inhabitable entity, and its adaptation to ever-varying human requirements has stimulated architectural imagination throughout the last century. The floor plans of houses before the rise of modernism were largely determined by social and representative needs. Apartment houses tended to be designed from the outside in, the facade being considered more important than the ground plan. In middle and upper class apartments, the semi-private living spaces, which served to display social status, were generally oriented towards the front of the house, whilst the private bedroom and children’s rooms, as well as the services, were generally at the back or in the centre of the house, thus indicating their secondary status.

With the advent of modernism in the twenties, a paradigm shift took place. Living spaces were no longer arranged according to social or representative needs, but according to their physical uses, and in turn determined the outward appearance of a house. Inspired by the reformist intention to build dwellings for the subsistence level, a true ‘science of floor plans’ started to emerge, searching for objective conditions of living that could be generalised and turned into normative values. Floor plan scientists claimed that an architect had not only to think in terms of rooms and corridors, but had ‘to design a framework for living, the forms of life itself’. To be able to do so, the scientists concerned themselves with the processes of living. Graphical methods were developed to track the user’s movements through his home and subsequently to minimise them by grouping the spaces together differently and by eradicating residual spaces. The old living kitchens, for example, were replaced by minimised, functional spaces in which all elements were positioned ergonomically - but they were mono-functional, usable by only one person at a time and left little space for change and coincidence.

Critical responses to the ‘one size fits all’ attitude of functionalism were not slow to emerge, as architects realised that they could not design lifestyles as such but only a spatial framework within which they could flourish. The modernist optimism that technological progress would eventually lead to greater equality in living conditions was not generally shared, as many architects feared it would lead to a minimal common denominator in housing standards which left too little room for the individual.

One approach to the demand for more spatial and functional flexibility was the use of sliding partition walls, which were widely used by architects such as Gerrit Rietveld. Mess van der Rohe and Le Corbusier. In Rietveld’s Schröder House in Utrecht, mobile living and the potential it offers does not have a great impact on our everyday living. Even our furniture has become more or less static. If major spatial changes in our homes become necessary, we rely on one-off refurbishment rather than spatial changes on a day-to-day basis.

A second approach aims, therefore, at enabling buildings to grow, shrink and change their functions over time according to user needs. The notion of growing and shrinking houses is commonplace in vernacular architecture, including modern vernacular. In many areas of the world, semi-furnished houses that have been inhabited for years are not an uncommon view. Often their ground floors are already in use while the top floor is still unfinished. The cultural evolution of housing from the purely practical into the aesthetic and represent-
An exterior wall may have to be turned into a common building that is suitable for later changes. Architects often tend to design buildings that are unchangeable and that cannot be altered or expanded. However, there are some architects who believe that buildings should be designed to accommodate future changes. For example, the concept of a ‘growing’ house does not necessarily require cutbacks on aesthetic form, but only by the inhabitants themselves and the users of the house.

The concept of a ‘growing’ house does not necessarily require cutbacks on aesthetic form, but only by the inhabitants themselves and the users of the house.

In a recent interview, Habraken reported that he had to overcome severe scepticism among planning experts who were determined to define the ‘ideal’ home down to the last detail. ‘I am not a political person, but I realised that I was demanding that other architects change their way of work and hand over some of their power. And I had to learn that precisely this step raises engineering problems,’ he says.

Due to the high complexity of planning processes, architects who frequently moderate projects with a high degree of user participation are among the first to experiment with new, computer-aided planning tools. Today, electronic information and communication technologies have made user participation possible in a wide range of industries. Mass customisation has been adopted, for example, in the furniture, computer and car industries. The most successful example of mass customisation is probably the Internet itself, where every user selects his own information or entertainment programme from the almost infinite number of resources available. In the housing industry, however, a common international standard such as HTML is still lacking. Researchers such as Kent Larson of MIT advocate for a ‘mean- ingful customisation’ that follows the model of Open Source software, where every user can read the source code of a programme and improve or alter it according to his/her individual needs. In architecture as well as in Open Source software, this improvement work will demand a high degree of knowledge on the part of the user. As users frequently find it hard to clearly express their preferences, Kent Larson and his co-workers have designed a ‘preference engine’ that reveals people’s needs and values, and a large number of different ‘design engines’ that emulate the style of a particular architect. Moreover, Larson is even devising ‘computational critics’ that provide the user with expert feedback on the choices they make during the planning process.

THE ARCHITECTURE OF METABOLISM WAS BASED ON THE IMAGE OF THE LIVING CELL. THAT IMAGE ENCOMPASSES NOTIONS OF GROWTH, DIVISION, EXCHANGE, […] TEMPORARINESS, RECYCLING, RINGS, AND A DYNAMIC STABILITY.”

Kisho Kurokawa

Kisho Kurokawa's Nakagin Capsule Tower, Ginza (1972). 340 capsules including their interiors were prefabricated in a factory, hoisted into place with a crane and attached to the concrete core of the building on the construction site. Even today the capsules, measuring 10m² (4.0 x 2.0 m) each, are used as both apartments and offices.
Le Corbusier: Ville Contemporaine (1922). With his first large-scale vision of a city Le Corbusier painted a picture of the ‘opened-up, green town’ which was to occupy the minds of generations of modern architects after him. The centre of the town for three million inhabitants consists of 24 apartment blocks each 60 storeys high. They are surrounded by six-storey apartment blocks, the so-called ‘redents’. On the outskirts his plans showed sparsely built-up garden towns for another 2 million inhabitants.

We must create the mass-production spirit.

The spirit of constructing mass-production houses.

The spirit of living in mass-production houses.

The spirit of conceiving mass-production houses.

Le Corbusier, Vers Une Architecture, 1923
NEW PARADIGMS FOR MASS PRODUCTION

We must create the mass-production spirit. The spirit of constructing mass-production houses. The spirit of living in mass-production houses. The spirit of conceiving mass-production houses.

In fact he was only calling for what had become a reality in North America decades before – ‘catalogue housing’ based on the balloon-frame construction technique (for example, by Sears, Roebuck & Co.) that had been in use since the mid-19th century. The high-speed construction of entire cities such as Oklahoma City in April 1889 was a powerful demonstration of what prefabrication could achieve. A contemporary report relates, ‘At noon on April 22, 1889 […] there was nothing on the site of Oklahoma City but a railroad station and a few wooden buildings. By nightfall a small town of about 10,000 persons had sprung up.’ Four weeks later, only the ‘balloon frame city’ was fully erected, consisting mainly of one-room prefabricated huts.

Le Corbusier’s vision soon became a reality in Europe, too. Architects were quick to develop the mass-production spirit in the 1920s and 1930s. Since mass production involves not only a rationalisation of production itself, but also of the planning process, architects soon started to lose influence and interest. A sort of two-class architecture emerged, in which only a minority of buildings – public, cultural and office buildings as well as private houses for the affluent – were designed by architects. The great majority of housing was left to the construction companies, to be built according to standardised plans, with standardised components, and very little influence by architects.

In the Information Age, the housing industry has taken the next step of standardisation – to a world-wide proliferation of floor plans, independent of site, context, client or contractor. E-businesses have been set up where coming house-owners can buy the construction drawings of their own personal dream home, with styles ranging from neo-colonial to modernist, and sported up to seven bedrooms and five garages. One set of standard blueprints costs between 500 and 700 dollars – with no architect’s fee. All the prospective house-owner has to do is visit his local building contractor with the plans and let him build it.

The classic ideal on how a house should be planned and built – at least among architects – involves a triangular relationship between client, architect and builder, in which all parties are well-informed, willing to communicate and have their fair share of influence in decision making. As mentioned here, the ideal has become the exception rather than the rule. Often, one or two parties – the client, the architect, and sometimes even the professional builder – are excluded from the process. Communication, the very factor that constitutes a measure for progress, is no longer considered a necessity.

But could manufacturers of catalogue homes, architects and suppliers not learn value or non-value of life itself and define the meaning of life? *Schulze points directly to one of the core competencies of architects: enhancing spaces by providing them with experiential value and functional flexibility. It seems logical, therefore, that architects should play a natural part in the new mass-production of homes. If we – investors, architects, builders, suppliers, and clients – increase our capacity of mutual learning from each other, our physical environments can only improve in the future.

25. IKEA/Sílanska: BoKlok (since the mid-1990s). Translated literally, BoKlok means ‘smart living’. The housing concept was developed in the mid-1990s in a collaboration between IKEA and Sílanska and has, in the meantime, been exported to five countries. Prices start at €500 per square metre.

26–27. BoKlok embraces two types of houses: the single-family house ‘Villa BoKlok’, which has so far only been offered in Sweden, and two-storey multiplex family blocks with six apartments each. Together with the apartment, each client receives a voucher for €300–€400 and a two-hour consultation session on interior design with IKEA.

28. ‘Continental Homes’ shortly before delivery, Nashua, New Hampshire, USA, Caravans, which first appeared in the USA in the 1920s, soon developed into the mobile homes as we know them today. As a rule, they are only mobile once in their life, i.e. when they are towed from the factory to their final site.

29. Apartment blocks in Hong Kong. The apartment blocks with the euphemistic name Harmony Blocks rise tightly packed on foundations which are several storeys high and have roofs designed as theme parks. Life in the streets is non-existent and monitoring systems keep undesired intruders away from the development.

9 Gerhard Schulze: Die Erlebnisgesellschaft. Frankfurt/Main 1999
In his drawing The Three Magnets, Ebenezer Howard, the founder of the garden-city movement, points out a duality that is still relevant in our day. We live in the countryside, close to what we consider nature, on our own plot of affordable land, in safe neighbourhoods, etc., but we also want the amenities and cultural institutions that a city has to offer, from flea markets to department stores, and from cinemas to museums. Howard’s solution to this dilemma was the Garden City: a settlement of limited size, limited density, with a clearly defined centre and perimeter, inhabited by a community of homeowners. Today, post-war suburbia has replaced the Garden City as the projection plane of homeowners’ dreams. It offers limited density and the opportunity to ‘build your own’, but it lacks what the Garden city still have: a centre and a perimeter. The majority of urbanites consider sprawl as one of the greatest threats to contemporary cities, nature and human community.

In the continued process of segregation during the last decades, only families with high incomes could afford to remain in the city centres. High housing prices have driven the lower income groups into the outskirts, especially into the large building blocks of the 1960s and 1970s, whereas much of the middle classes have left the cities altogether, heading for suburbia. In recent years, there are indications that this exodus has slowed down, but it remains unclear as to whether this can already be interpreted as a reversal of the trend. When we make our choice for a dwelling place and place usually take account not only the price of a home, its size and physical value, but also ‘added value’—factors such as being close to nature (both common grounds and a private garden), good access to public amenities and public transport, a children-friendly, clean and safe neighbourhood, and the opportunity to lead an individual lifestyle in an individualised environment. Urban areas, with their frequent shortage of green spaces and typological diversity, their high housing prices and their social problems, are not in the best position to compete with suburbia.

Currently, human lifestyles are diverging towards two extremes. On the one hand, an increasing number of people are becoming more and more mobile. Although nomadism— even in its modern form—is no new phenomenon, globalised economy and increasingly permeable national boundaries have led to the emergence of a new, migrant working class. The world is literally ‘on the move’, and sociologists are wondering whether the ‘century of refugees’, as the 20th century has already been called, will be followed by a ‘century of nomads’. The modern nomads spend their short stay in cities that are either public—such as airport lounges—or generic eros for a widespread attitude towards the burdens that life in a society essentially presents. Sociologists argue that the new culture of introversion has its roots, in part, in the widespread anxiety that has arisen after the attacks of September 11. People tend to go out less, spend less of their time in public spaces and more at home, prefer having fewer (and closer) friendships to many superficial relationships, prefer in-house well-being and body care to adventure sports, and rediscover values such as fidelity and family. Richard Sennett has written extensively and critically on this subject of identity, composed of elements of the inner political framework adequate, then, to make these ideas successful enough to compete with the detached, single-family homes that still constitute the majority of new homes built in most European countries? In Switzerland, their share has just grown again—from 52 per cent in 1999 to 63 per cent of all new homes in 2006. Recently, the German region of Baden-Württemberg’s Council for Sustainability has suggested a system of ‘area certificates’ as an ecological and political measure against urban sprawl. If the scheme is ever put into reality, these certificates would work in a similar way to the emission certificates that were introduced to implement the Kyoto Protocol.

In the London Borough of Tower Hamlets a fresh kick of paint, new curtilage and a miniature front garden with fresh flowers, artificial lawn and barbeque. This campaign was intended to draw the author’s attention to the potential of turning the towns waste land into desperately needed living space.

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We started out by undertaking broad and thorough research which we did into eight categories: community, technology, sustainability, identity, self-sufficiency, dwelling versus home, network living, human being dynamic versus constant. These eight topics have been the generator and the aim of the Boase project all the way through the process.

What were your three main inspirations for Boase? - experts you asked, books you read, existing projects.

Yes, of course. We knew from the beginning that the system could maybe be used somewhere in the Arctic to raise the building above the ground so the wind could ventilate the site beneath the building.

In how far will community life in Boase (hopefully) be different from current community life in settle- ments as they exist today? And how does the architecture of Boase compare with them?

In general, do you observe a lack of holistic thinking in architecture today? And could this have to do with the way we are trained as architects?

The Nordic way of thinking architecture has always been holistic: I just think that architects and de- signers forget about this during the 80s and 90s. Some of our big Nordic milestones have been misunder- stood or misinterpreted by those who dominate the architectural scene today.

With Boase, you are actually 'giv- ing something back' to nature — and to mankind. Or, as you once put it, “We reclaim the earth for future genera- tions”. Do you see this as a turning point away from archi- tecture that usually only ever takes, never gives? I believe that the interest in the individual human being is generally growing in Denmark. But I do not think the situation will change dra- matically in the near future.

The site that was chosen on which to build Boase is highly contaminat- ed. How was it used before? There was a small oil company on the site that specialised in producing oil.

We used a very limited number of materials, maximises structural strength and enclosed volumes, produces extremely high strength-to-weight ratios, greatly reduces the energy required for building, produces nothing that is toxic to the environment and designs structures that are infinitely recycled and re-used, or the other less visible place.

What were your three main inspirations for Boase — experts you asked, books you read, existing projects from architecture that you looked at? Firstly, we went on a field trip to a train factory called Scania in Rand- ers, Denmark. They showed us how to produce room-size volumes with waste-saving way of building. Therefore, I believe that this method is necessary for building in the fu- ture. At the same time, however, you have to consider energy, the environ- ment, and the use of healthy materi- als as well.

In reality, it is still mainly the price that decides which houses are successful and which aren’t. Are the Boase houses affordable to everyone? The houses will be for rent and will cost around 6,000 DKK (850 EUR) per month for each 72 square-metre

The home of the future will have to recon- cept all aspects of how we live: the urban built environment close to nature, robust, affordable and mass-produced but individual, able to grow and shrink, provide privacy but also the opportu- nity to socialise, and give back to the envi- ronment more than it takes. Faced with the question how to achieve all these seeming- ly contradictory goals, we might consider three strategies that have been put forward by leading thinkers in the last decades:

1. Study the way nature grows, builds and evolves. In recent years especially, the living things around us have proven to be one of the richest sources of inspiration to designers, architectural projects and material scientists. In his essay Lessons From Fractals, 2 the American architect and designer Eugene Tso mentions twelve underlying principles of natural structures.
3. Rethink our planning strategies. In nature, simplistic if-then relationships do not exist. Every action provokes not one reaction, but a multitude of reactions. Our ecosystems are not based on deterministic programming nor on central control, but on an intricate network of iterative, recursive control circuits that all interact with one another. Our own brain, with its neuronal ‘architecture’ is an example. In his book The Art of Network Thinking, 16 the German biologist and planning theorist Frederic Vester argues that planning must embrace this kind of complexity rather than try to control it. 

Secondly, we might profit greatly if we rethink the roles of architects, manufacturers and builders. Kent Larson’s forward-looking concept of the ‘Open Source Building’ 17 implies that ‘... Builders become assembled, architects devise design-engines to efficiently create thousands of unique environments, and customers (home-buyers) become ‘innovators’ at the centre of the process by receiving personalised information on design, products and services at the point of decision.’ Not unlike Vester’s idea, the notion of ‘Open Source’ is based on the assumption that if we relinquish central control of the planning process and allow a greater degree of unpredictability and ‘fuzzy logic’, the result will become more individualised, more robust and less susceptible to failure.

Thirdly, the concept of symbiosis leads us back to a point we discussed at the very beginning of this article. The human world has turned into a world of specialists, in which the concepts of individuality and difference predominate. In doing so, we have created the potential to create a multitude of fruitful symbioses, in which each participant can learn and profit from the other. A truly broad-based symbiosis in the planning process, one that is built upon mutual respect, solidarity and close communication, will be a sound foundation for our quest to create living environments for the 10 billion people that will soon inhabit our planet.

...
What if the shape and size of human dwellings were determined by the inhabitants themselves through a process of negotiation with each other? In *Negotiate my boundary*, their final thesis at the Architectural Association in London, the five young architects RAMTV developed a planning tool that enables this kind of negotiation. The result is a cluster of flats that fulfill not only the participants’ individual needs, but also the needs of the community as a whole.

**Negotiate my boundary** proposes a model for customising and purchasing dwellings via the Internet. Mass-customised collective housing with users’ participation is provided through web-based software which triggers intensive interaction and negotiation among future clients. This takes place in a real-time environment with incorporated speculative market strategies. All these operations occur under a stock-exchange model: before buying, the clients negotiate over the Internet with their neighbours about the shared space. This model integrates principles of simultaneous reaction and responsiveness, which installs real-time interaction and negotiation amongst clients in a real-time environment with incorporated speculative market strategies. The Internet is used as an architectural design instrument with its interactive parametric potential to generate – strategically, spatially and socially. It becomes a medium for a renewed idea of community and a tool, not only to fulfill and enable social patterns, but mostly to stimulate new social interactions. The web ‘significantly lowers the threshold of personal communication between users and allows for the development of a certain degree of self-selection and communal self-organisation in a safe and non-committal virtual domain. This is also the domain in which a genuinely participatory design process finally becomes plausible. It is precisely these ‘design processes’ of choice, articulation and negotiation that become the vehicle for building up the social relations that might lead to new forms of community.’

The main focus is the negotiation of boundaries along multiple modes, spatial and social, and on many different scales, from nano-scale to xl. Negotiation becomes a generative parameter for the spatial actualisation of an architectural proposal. The boundaries created within the project do not define public/private dichotomies, but rather gradients of intimacy establishing multiple domains and therefore manifold modes of social exchange. It is not only about separation and privacy, but also about the potential performative effects that interactively relate boundary and dwelling.

**1. Research process**

The research was initiated by focusing simultaneously on two autonomous systems – the territorialising system and the ergonomic system – as a framework for analysing Le Corbusier’s *unité d’habitation* as an initial ecology. In parallel, separate research into contemporary social realities gave information on the construction of social scenarios. The intriguing instability of social relations triggered the research into responsive environments to enable spatial responses. New boundary systems are generated to record and evoke social and spatial dynamism. A genotype system (derived from the territorialising system) and an activity-tile system (derived from the ergonomic system) interact and inform each other in ways that allow the emergence of a definitive spatial organisation, a hyper-attached system, which allows it to be mass-customised by potential users on the web prior to the installation of the residential field on a chosen building site.

1. **Territorialising system > genotype system**

*Unité d’habitation* was analysed to identify its system of unit types and their combinatory patterns. A high level of general complexity, derived from a range of relatively simple unit types and their combinations, is non-visible from the repetitive pattern of the façade. As the principle of interlocking double units is a key feature of the system, this research generates a genotype system that is focused on double unit negotiations, testing the potential of the in-between (negotiation space) of two proximate units. It defines the basic geometry, structure, circulation and combinatory (interpenetrating) principles.

2. **Ergonomic system > activity-tile system**

The ergonomic system research focuses on the relationship between activities and ergonomics – an interface between
the human body and its surrounding domestic environment. Ergonomic positions of the human body defined with activities generate the activity role system. Developed to challenge the typical section of living spaces through floor-to-ceiling deformation in a continuous variation and modify the interior perceptions in a residential unit.

3. Responsive environments > boundaries
A responsive environment is able to react to stimuli serving your flat is breathing with you and learns your habits if this prior perceptions in a residential unit.

4. Social scenarios > neighbourhood
A responsive environment is able to react to stimuli serving your flat is breathing with you and learns your habits if this prior perceptions in a residential unit.

Spatial organisation = Hyperattached system

Excerpt from the catalogue regarding possible activity tiles. From left to right: connection between two rooms, tile ‘sleeping accommodation’ and the ‘bath tub’.

Type of household (UK 1995 – 96)

<table>
<thead>
<tr>
<th>Type of Household</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single under pensionable age</td>
<td>3%</td>
</tr>
<tr>
<td>Married couple</td>
<td>29%</td>
</tr>
<tr>
<td>Married couple with 1 child</td>
<td>13%</td>
</tr>
<tr>
<td>Married couple with 2 children</td>
<td>7%</td>
</tr>
<tr>
<td>Married couple with 3 or more children</td>
<td>15%</td>
</tr>
<tr>
<td>Single parent with dependent children</td>
<td>3%</td>
</tr>
<tr>
<td>Single parent with non-dependant children</td>
<td>4%</td>
</tr>
<tr>
<td>Two or more unrelated adults</td>
<td>3%</td>
</tr>
</tbody>
</table>

Married couple

Married couple with 1 child

Married couple with 2 children

Married couple with 3 or more children

Single parent with dependent children

Single parent with non-dependant children

Two or more unrelated adults

is clearly adapting to new social arrangements. The increasing trends are single-parent households and households of singles or couples over pensionable age.

By intensive inclusion of shared households, a varied activity community is created, instead of the discrimination effect of separate urban enclaves (maternity homes, elderly residences, etc.). Rather than treating these as separate social phenomena, a new potential for social exchange arises: different lifestyles and timetables give opportunity for mutual help – members performing services to each other or and fulfilling social needs (e.g. child care).

II. SOCIAL AGENDA

The potential community is formed via web-based software, first as a virtual entity, before it is actualised on-site. The project is a ‘social experiment’ responding to and amplifying the existing social trends, not only to fulfil the essential needs for domesticity and privacy, but to encourage new social interaction among future members of the community. It suggests new relations among households, intersections of boundaries and their controlled permeability, sharing and renting spaces, opening up boundaries to make them public.

Your boundaries are not defining public-private dichotomies, but rather gradients of intimacy on multiple scales and therefore modes of exchange. The approach challenges the definition of the dwelling as ‘all inclusive’ with an ‘excluding principle’ (e.g. excluding services > a dwelling without a kitchen) and an ‘including principle’ (e.g. including public extras > a dwelling with a home cinema). This process attains a highly structured system of dependencies between households and a total inclusion of public space in the private domain, with a network of small-scale public programmes incorporated in the dwellings (e.g. mini cinema, restaurant with home-cooked food), leasing or renting part of the flat (sauna, magnificent dining room, professional kitchen).…

Current social trends suggest that households will be smaller than ever before. What might be called the ‘family'
designs that are as individual as the preference sets and negotiated requirements of each occupier. It is a parametric design process that explores mass-customisation on an urban scale. The fact that the proposed housing units are not suburban villas (e.g. freestanding objects like Villa Savoye), without physical proximity to their neighbours, determines the necessity for mutual decision-making, where each occupier’s unit affects the other. The mass-customisation process selectively records user preferences and negotiates with design constraints. It is structured at three different levels, with each next level refining the degree of individualisation of your dwelling environment: parametric neighbourhood looks at the various ways in which the project can be specified by clients on an urban level; customising the spatial envelope includes the procedures by which users are able to customise their own dwellings; and customising the boundary defines the interactive systems of responsive enclosures, where clients select and control the shape and performance of their dwelling-unit boundaries.

**level 1 > Parametric neighbourhood**

The responsiveness on an urban level is determined by the parameters that both clients and planners define. A client’s log-in on a web page is an official entrance to the club, one becoming a member of a community, while simultaneously establishing the initial inputs for the parametric neighbourhood by filling in an on-line questionnaire specifying their preferences and negotiates with design constraints. It is a parametric design process that explores mass-customisation on an urban collective residential scale. The fact that the proposed housing units are not suburban villas (e.g. freestanding objects like Villa Savoye), without physical proximity to their neighbours, determines the necessity for mutual decision-making, where each occupier’s unit affects the other. The mass-customisation process selectively records user preferences and negotiates with design constraints. It is structured at three different levels, with each next level refining the degree of individualisation of your dwelling environment: parametric neighbourhood looks at the various ways in which the project can be specified by clients on an urban level; customising the spatial envelope includes the procedures by which users are able to customise their own dwellings; and customising the boundary defines the interactive systems of responsive enclosures, where clients select and control the shape and performance of their dwelling-unit boundaries.

**level 2 > Customising the spatial envelope**

This process of spatial as well as social negotiation allows for several unexplored results of spatial materialisation of the virtual spatial envelope that were placed on the market through client-defined modes of negotiation about the position, shape and performance of the space among several different parties. A client is invited to negotiate with its neighbours about the position, shape and performance of their dwelling environment: parametric neighbourhood looks at the various ways in which the project can be specified by clients on an urban level; customising the spatial envelope includes the procedures by which users are able to customise their own dwellings; and customising the boundary defines the interactive systems of responsive enclosures, where clients select and control the shape and performance of their dwelling-unit boundaries.

**level 3 > Customising the boundary**

The last level of customisation focuses on the enclosure systems directly shaping the project’s interactive social environments. Different responsive systems are proposed to the clients, who can select and specify their pattern, shape and specific kinetic performances of the boundary that affect the relation to the exterior, to all neighbours and also to the internal space of the dwelling. Two developed interactive systems (louvre system renders the behaviour of solar and shading elements, while the spatial envelope enables the field of negotiation to occur inside a very specific set of constraints.

**CONCLUSION**

Urban residential architecture with negotiable boundaries is a product of today’s intricate social situations and interactions. It is a Big Brother situation, where you are extremely exposed (if the nature of your ego allows it) and your facility and lifestyle is shared with neighbours and a larger public. If you don’t fancy the exposure, you can withdraw and remain totally isolated: your home becomes a cocoon. Either way, the setting becomes a responsive environment where your behaviour conditions the emergence of scripted architectural elements. Your domestic space lives and breathes with you, learning from and reacting to your habits – if this is what you want.

The proposal sets up strategies, parameters and regulations. Therefore, a single, definitive outcome in a system is never achieved – rather, the ongoing evolution of the project is continually recorded by on-line information gathering, display and negotiation. There are many possible actualisations, depending on social input, negotiation conditions and site specificity. The simulation of real-life scenarios by potential clients is an off-line space, simulation of public programmes and the range of activities in the dwelling etc. In parallel to the spatial preferences, they are developing their social scenarios – establishing links among future members of a community and defining the typical types of household boundaries, being either autonomous or non-autonomous and either public or non-public. All their choices are saved and used to define the mode of aggregation of the units in a new urban situation – into one non-hierarchical sponge-like spatial organisation.

The planners’ task is to define the general envelope of the dwelling clusters with the initial constraints set by a hyper-connected system (geometry, principles of combining units – penetrating one into another) and parameters that guarantee a coherent development of the aggregation, such as daylight conditions, access, structure and contextual influences. The decisions of every party are embodied in a virtual spatial envelope with clearly defined negotiation spaces, which serve as a basis for further customisation and design definition.

**above (top)** The individual façades are individually adapted in the final planning stage. Using a system of vertical louvres, the user can determine which areas of his home should be open to the outside and which ones he wants to be more intimate.

**above (bottom)** With no- go (‘No-go my boundary!’), the finished apartments could look like this – or they could be completely different. As soon as the negotiations are completed, the Cluster Blaster program automatically generates the working drawings from the cumulative data.

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2 A dwelling is structurally a superstructure accommodating who’s who, including both or shower, WC and kitchen facilities, as self-contained (UK, 1993).
3 Shared household includes at least a double boundary (small households within another larger household arrangement – linking of small households (single-parent family, elderly, single) into larger collective ones.)
4 Lofting is an automated process of connecting several sections to generate a 3D result; a technique commonly available in modelling software.
La terra senza dolcezza
d’alberi, la terra arida che
rompe sotto Siena il suo
mareggiare morto
e incresta in lontananza
È un luogo non posseduto dal
senso, una plaga diversa
che lascia transitare i pensieri
però non li trattiene,
non opera come ricordo,
ma come ansia.
The mass-housing blocks of Taipei, as conceived by their architects, are dreary and monotonous. These banal buildings, however, become the backdrop for extraordinary creative expression. In an ad-hoc and probably illegal manner, windows become bays, bridges are added, and balconies are infilled with an endless variety of forms, materials, and systems. Some show a meticulous attention to detail while others look like death traps. But the whole reveals, at the scale of the city, a powerful desire of individuals to create personal and unique places of living.

While not expressed in the façades of U.S. and European buildings, this desire is revealed in the hundreds of books, magazines, and television programs devoted to home design. Companies like Ike, Home Depot, and Lowe’s exist largely to tap this do-it-yourself market. The housing industry, however, has not found a workable strategy for meaningful customization.

Other industries are rapidly adapting their products and processes to respond to the market demand for customization. Car websites encourage visitors to ‘build and price your car’; Dell has become the most successful PC manufacturer by producing tailored computers for individuals; the New York Times allows online members to ‘create a customized news alert’; Nokia offers interchangeable faceplates to personalize mobile phones; and clothing and shoe companies can scan your body to create personalized products. Many of these companies are, in effect, integrators who form business relationships with a network of strategic partners and suppliers to offer “batch quantities of one” personalized products. They provide consumers with increasingly sophisticated configuration and decision-making tools for customization. Speaking at a National Association of Home Builders conference in 2003, William Novelli, Executive Director and CEO of AARP, said the following about baby boomers and housing, “They love choice: set up the smörgåsbord and let them help themselves. They will. They want information—and the more sources the better because they are not afraid to make decisions—but only on their own clock and on their own terms.”

The existing process and fee structure of housing development, however, makes it largely impossible to address the unique design problems of individual residents. Architects typically focus on planning and the exterior envelope, while creating generic living spaces. But the idea for architectural customization is certainly not new. Mies van der Rohe suggested in 1927 that “if one limits only the kitchen and bath as standardized rooms, and the remaining living area with movable walls, I believe that any justified living requirements can be met.” Walter Gropius, founder of the Bauhaus, wrote in 1930 that industrialized construction processes could “meet the public’s desire for individuality and offer the client the pleasure of personal choice.”

Today, the need for meaningful personalization goes well beyond the satisfaction of desire. The home is rapidly becoming a center for proactive health care, distributed energy production, work, commerce, entertainment and learning. Homes in the future will likely contain the most complex activities of any building type. It can be argued that many of the looming societal problems due to demographic pressures and energy shortages must be addressed by finding a new model for the cost-effective tailoring of the form, technologies, and services to meet the needs and values of individuals.

**Open Source Building**

We believe that it is now possible to increase the quality, responsiveness, cost-effectiveness, and formal richness of residential architecture by taking advantage of the new tools of our epoch: inexpensive computation, powerful algorithms, almost-free electronics, the internet, high-performance materials, and new design, fabrication, and supply-chain technologies. We propose a new model for design and construction, called Open Source Building model, with six underlying concepts:

1. Integrators partner with developers to offer branded, tailored solutions to individuals
2. Buildings are disentangled layers of integrated assemblies
3. Manufacturers agree on interface standards and become tier-one suppliers of components
4. Builders become assemblers
5. Architects design engines to efficiently create thousands of unique environments
6. Customers (home-buyers) become ‘innovators’ at the center of the process by receiving personalized information about design, products, and services at the point of decision.
In this chapter, we summarize the work of the mit House_n Research Consortium to prototype and test selected design, decision-making, and construction systems that support this new model.

**Chassis and Integrated Interior Infill (I3)**

Chassis is the well-publicized HyWise concept car conceived as a standard chassis common across their entire product line, with highly customized ‘infill’ (the body parts, finishes, electronics, etc.) often provided by ‘Tier-1’ suppliers. Personal computers are built with a similar strategy. No comparable approach, however, can be found in the design and construction of buildings.

The mit House_n Group has developed prototypes to separate a building into a ‘chassis’ (the standardized structure, power, data, and plumbing of a building) and ‘infill’ (apartment interior fronts that are customized at the point of sale by the individual and connect in standard ways to the chassis). A variation of the chassis/infill strategy was used to create an apartment-scale research environment to study the interactions of people with new technologies. The PlaceLab, an MIT House_n plus trax LLC initiative, consists largely of prefabricated, customized cabinetry components with accessible connections to the building ‘chassis’. These components house sensing, communication media, lighting and control systems.

We envision a future where individuals could tailor their physical and computational environment according to their needs and values via customized Integrated Interior Infill (I3) components, each with pre-installed, tailored technologies.

**Rethinking the Design Process for Responsive Places of Living**

The customization of homes is significantly more challenging than the mass-customization of individual products since the users of the system have a wide range of age, interests, skills, and cognitive ability. The resulting home is a complex mix of many products, some standard and some customized, that exist in the complex context of architectural form, light, and materials. Since it is not feasible for an individual designer to work closely with each resident of a large housing development, a design interface that provides individual non-expert designers with the means to effectively make informed decisions without becoming overwhelmed by the process is essential. This involves much more than simply offering choice since, as Joe Pine writes, “Customers do not want choice. They want what they want and (generally) now.”

A good designer has the ability to keep many variables at play simultaneously until converging on an integrated solution – simultaneously solving many problems, from formal to functional. We believe that home-buyers, using sophisticated decision making tools, can become ‘innovators’ at the center of the process by receiving carefully tailored personalized information about design, products, and services at the point of decision. In our model of design, experts create systems that capture their design knowledge and values. They are used to help non-expert designers through complex design and decision-making problems – without requiring that one think like an expert. This approach to design decision-making for non-expert designers involves four integrated components:

**Preference Engine**

A preference engine takes people through a series of exercises or games to uncover needs, preferences, values, and reasonable tradeoffs – what might be called the architectural program. The preference engine builds a user profile that includes family size, budget, aesthetic values, and range of activities. To prototype and test various strategies, we built a digital table that projects images and data from below onto a luminous surface, and uses sensing to recognize gestures and optically tagged architectural component scale models.

**Design Engine**

The design engine is a computational algorithm that makes use of the preference engine data to create a starting point design that the “designer” (i.e. the future homeowner) then refines.

We envision many design engines, each capturing the unique values of a particular architect. We have experimented with several strategies, ranging from a simple decision that finds a best-fit among a series of pre-developed solutions, to a more complex and unconstrained design system.

**Design Iteration Interface**

Using one of many possible design iteration interfaces, customizers can experiment with design alternatives, and evaluate a complex mix of elements including form, finishes, lighting, health technologies, appliances, comfort systems, and services.

**Standards**

Widely available, highly customized places of living will only be possible if the design and construction industry collectively agrees on standards for how building components and systems connect. This would involve standardized interfaces for power, data, plumbing, and mechanical attachments as is common in the electronics industry. It would allow interoperable assemblies with sufficient economies of scale to increase quality and reduce costs. This approach may transform how homes are created over the next 10-15 years, and create new pathways into this $300-billion-per-year-market for companies producing materials, products, and services for the home.

It could create the ultimate mass-customized product: highly personalized living environments comprised of a complex integration of customized, mass-customized, and standard integrated assemblies.

**Computational Critics**

While iteratively exploring a design solution, most non-expert designers will require feedback from experts related to best practices, building codes, and design integrity. Since face-to-face interaction between a skilled architect and client is typically not feasible for housing developments, we envision a system where architects provide software ‘plug-ins’ that non-expert designers can use to get real-time feedback as they make changes to their designs. While code requirements can be rules-based, capturing the more subjective values of a designer may require a more open-ended approach. Computational critics can provide feedback to the user as incremental changes are made to the design. House_n researcher Reid Williams implemented a prototype of a computational critic system that runs with the design iteration interface described above.

Once the design is set, specifications for standard products can be sent directly to the manufacturer, and machine data can be sent directly to millwork fabricators, for example, for the production of customized or mass-customized components.
No two people are identical. This realisation was kept in mind by Rotterdam architects Drost + van Veen when they designed the Swanla estate on the outskirts of Zevenhuizen. Rented and owner-occupied properties, lofts and terraced houses of different sizes – all have been joined together to form two homogeneous compact blocks, which provide a great deal of leeway for users who may want to modify them at a later date.
Zevenhuizen is one of many small villages in a catchment area in the northern part of Rotterdam. It is 16 kilometres from the city centre and located between two freeways in flat ‘polder’ countryside. The Zevenhuizen-Moerkapelle has around 1,000 inhabitants, a figure which is rising as is also the number of pensioners, singles and single parents. But there are also families here who want to avoid the noise of the big city, looking for the peacefulness of the green landscape, an idyll between canals and greenhouses, industrial park and freeway.

At the moment, ‘a lot of work is being done on the housing market’, says the local community in an official statement. And the ‘need for high-quality homes is growing’. Such homes are being built in Utrecht, Rotterdam and Amsterdam but you seldom hear of this happening in a small village such as Zevenhuizen on the outskirts of the city. The young Rotterdam architect’s office, Drost + van Veen, were willing to take on this challenge. The development company, Woonpartners Midden Holland, invested around 11 million euros in SWANLA, a two hectare residential project on a piece of land which was formerly used for agriculture located at the edge of the village. Not much money considering the noble ambition of creating something ‘completely different’.

The main aim of the programme was to provide accommodation for less well-off people and people with a higher income in one location. Following this plan consistently, the architects designed a jigsaw puzzle of rented apartments, apartments for sale, lofts, single-family houses and terraced houses. The result is a homogeneous and compact urban-planning concept. It generates the impression of a fortress – a strong gesture which combines the different forms of living in a single entity. The social character of SWANLA Catsburg becomes especially clear if the project is compared with other buildings in the surrounding area. The estates developed around the site in past years correspond to the home construction companies’ standardised terraced houses which are found all too often in the provinces of Holland.

As winners of a limited competition, (the city invited three offices to present their work), Drost + van Veen started planning in 2000 and, at the beginning of 2005, the complex was completed. I accompany the architect, Evelien van Veen, on a tour. We approach SWANLA from the west and cross a narrow footbridge. The site is surrounded on all four sides by canals. It is only possible to reach it in two places by car, in the east and west corners.

“At the request of the client, people should not park in front of the house. This was something completely unusual for a small village like Zevenhuizen,” said Evelien van Veen. And this is what was done. In spite of the unusually wide road, there are no cars in front of the building because most of the residents park their cars in the underground garage or between the residential units. A brick-red wall makes it possible to see into the courtyard.
In spite of tight financial resources, the architect’s office paid special attention to the selection of building materials. Brick and stone are typical of the region. Traditional forms of building, materials and context have played a leading role in the projects of Drost + van Veen: the small tiles used for the SWANLA roof, for example, were a response to the village scale of the project. The ceramic shingles have a slightly horizontal bend in the direction of the sky and reflect the sun, although this is rare at this time of year.

The residential complex comprises 48 terraced houses and 41 rented apartments with an effective living area (BVO) of 11,680 square metres. It consists of two ‘islands’, one being around 50 metres wide and 130 metres long and the other having the same width but being 85 metres long. What is striking is their arrangement: only the end points are on the same axis whereas the edge of the block narrows slightly towards the middle. The large form is retained but is never-theless pleasingly interrupted when seen in perspective. There was another important reason for splitting into two parts and offsetting the roads, however: they reflect back on the structure which determines the adjacent rows of houses and the axes of sight into the open meadow landscape.

We continue walking along the south-east side. After around 50 metres, the building becomes lower. The three-storey terraced houses begin here but the materials remain the same. The dark camouflage-like paneling is in the form of a strip or a monopitch roof accompanying the continuous brick-red base set back horizontally. But, in spite of the differentiated cubature, it is very difficult to distinguish between terraced house, single family house and maisonette apartment. As in the case of the rented unit, glass façades at the entrances and closed anthracite-coloured garage doors alternate with each other. The wooden doors and window frames are painted in the same grey colour. The roof, which can almost be touched, provides us with shelter against the rain. A troughs mark the dividing line between the private and communal outdoor area, which has now been planted.

The largeness of form which characterizes the complex from the outside gives way inside to an almost family-like ambience. Everyone can choose who he or she mixes with socially, or chooses who not to mix with, as the case may be. Within the terraced and single-family houses, the condensing principle rules; garden arbours seam a narrow alleyway in the middle of the courtyard. The terrace between house and outbuilding is completely private.

Most of the people living in SWANLA Catsburg come from the vicinity, namely a lot of older people who, as the architect said, felt attracted by the ‘special nature’ of this housing concept. The ground plans of the residential units are all based on the standard size of 5.4 m wide and 11 m or 12 m deep. The types of apartment vary between 109 and 190 square metres of living area and the maisonette apartments are between 141 and 196 square metres in size. Access is from the lowest level, with a single flight of stairs leading to the upper floor. The different ground plans are all based on the same scheme: a spacious living room with an open kitchen, two or three bedrooms, a balcony or loggia facing outwards or a terrace facing the courtyard. Everyone profits from the daylight which comes into the rooms from above through the large glazed fronts and the roof windows. This is especially clear in the corner houses, whose living space is lit up from two sides.

In the plans, the interior fittings were reduced to the essentials. The buyers select the ground plan according to their personal needs and wishes. But not only that: they make the final decision on the individual appearance of their home, for example the garages which can be fitted out to create an additional room. If the financial means permit, the owners can have another floor built where this is possible. This is done by placing a monopitch roof on the already existing floors. In the course of the next few decades, SWANLA Catsburg will change in appearance and even that which is shown by the many design models will not be applicable or has never existed in such a form. In terms of its shape, the building emanates strength. It is alive.
Previous Four intimate views into the interior: in spite of the outwardly uniform apartments, the occupants and their styles of living differ from each other considerably.

Below (left) The gable roof and façade form a unit. Their surface consists of anthracite-colored ceramic shingles with a slightly horizontal kink that reflects the sun and endows the whole with a village feeling.

Below (right) Additional living space is provided by the monopitch roof which can be placed onto the existing flat roof if required.

Bottom (clockwise from left): Roof facade (vertical section), general plan, cross-section through underground garage and rental apartments with covered access.

Guggenheim Museum Bilbao
Host of the award event for

INTERNATIONAL VELUX AWARD 2006
FOR STUDENTS OF ARCHITECTURE

WWW.VELUX.COM/A
1. The ‘hedge island’ Hageneiland is part of a master plan created by Fritz Palmboom and Els Bet. The proximity to water – as is often the case in the Netherlands – determines the urban planning concept.

2. The interior estate is completely free of cars. The rows are each composed of a maximum of six individual houses and are interspersed with many smaller spaces, which give Hageneiland the appearance of a village.
Anyone who has been to Ljubljana, the capital of Slovenia, will know the picturesque Old Town with its many small cafés dotted along the River Ljubljanica. Not quite so well known, however, is the attractive ‘Krakovo’ district not far from the Old Town. Originally created as a trading quarter for the neighbouring monastery built in the Middle Ages, it has in recent years become increasingly attractive for people who want to be near city life but also would like to have a house with a garden. Erected in small lots, the country-house style buildings – each adjoined by an elongated garden – look like a green oasis in the most densely populated city in Slovenia.

It was in this environment that the small XXS House, planned by Dekleva Gregorič Architects from Ljubljana, was built in 2004. The client, the father of Aljosa Dekleva, and an architect himself, helped to finance the young architect’s office in its first independent project. The building plan was based on an unusual idea for using the house: the clients lived in the countryside and the couple wanted a ‘weekend house in the city’ in order to be able to participate in the city’s cultural life. The reaction of Dekleva Gregorič architects to this idea was a kind of strict minimalism in form and material: the simple 43 square metre cubature of the ‘Xtra Xtra Small House’, which had to match the preceding building due to local building authority regulations, is emphasised even more by the façade and roof paneling made of large-format fibre-cement panels. The windows, which are flush with the paneling, look as if they were cut to size with a knife. There are two rooms, one on top of the other – similar to the concept of a hotel suite. Equipped with only the minimum fittings, they perform all the functions – from bathroom to small kitchen – which are necessary for short-time stays. A sculptural steel staircase in the middle of the ground floor leads to the bedrooms on the upper floor. Here, the architects used a trick to handle the north-facing orientation of the roof: the elongated roof dormer does not open out towards the front but upwards, thus admitting a large amount of natural light into the rooms. This makes living in a very small space a unique experience in a townhouse bathed in sunlight.

1. The building authority regulations, due to which the roof is oriented towards the north, necessitated a special light concept in order to be able to supply the interior with a large amount of natural light.

2. The attractive ‘Krakovo’ district near the old town is characterised by small housing lots in the country-house style. With its external form, based on the preceding building, the XXS House blends in perfectly with its environment.

3. Location diagramme.

4. Elevation.

5. Thanks to the long roof dormer, the height of the upper-floor room is sufficient. In addition, the shape of the dormer allows the light to enter from above, not from the front.

6. A great deal of natural light enters through the staircase opening and lights up the ground floor. The minimalist staircase looks like a sculpture made of steel. Only a thin piece of steel serves as a handrail.

7. The cubature of the small house looks as if it has been cut out with a knife due to the large-format fibre-cement panels used for the façade. It therefore stands out from its surroundings, especially in terms of the materials used.
Situated on a small island near the huge lake Mälaren, the red-coloured wooden ‘Villa Karlsson’ is a modern example of simple family-life planning and co-existence with the wild, Swedish nature. Its shape resembles a traditional Swedish cottage, albeit in an extended, extra long, version.

The brief from the clients, a couple in the mid-sixties with no previous experience with architects, was to create space on the ground floor for themselves; the upper floor should be ready for future extension and be used by visiting children and friends when staying overnight. Traditional barns, warehouses and other rural buildings in the area have been the primary source of inspiration; a pattern still very common on and around the island Tidö-Lindö.

Rooms en suite in combination with transverse passages offer several alternative ways to use the house. Windows are placed to highlight certain views, e.g. of the garden, lake, a special tree or the sky above, as if the windows and the views outside were paintings in a fine art gallery. To keep construction costs low, the modules are based on a standard cc1200 module. Standard building components made the costs extremely low, i.e. 30-50% less than the average cost level. The exterior materials of the Karlsson Villa are oversized wooden panels made of the heartwood from slowly grown pine. Traditional Falu-red paint creates the prismatic look, at the same time re-interpreting the Scandinavian roof technique used for centuries in the North and on the island of Gotland. All exterior fittings are also painted red to emphasise the traditional, monochrome exterior look of a Swedish wooden cottage. As a contrast to the red exterior, the interior is kept bright monochrome with plaster-white surfaces and modern Scandinavian and international furniture classics.

1. Villa Karlsson is set in an area with ample space to the next neighbour, the nearest small town and the sky above.

2. Freely placed windows in a sprawl punctuate the roof and the ‘closed’ façades together with the screen-like, fixed shutters. This makes the light inside the house differ and change in a constantly changing pattern of light and shadow.

3. Roof windows placed as light shafts add light to the staircase and to the upstairs living space ready for guests, but not yet furnished apart from a few decorative items.

4. The interior, which is kept bright white, forms a marked contrast to the ‘Falu-red’ colour used outside.

5. Detailed cross-section.

6. Axonometry of the construction.

Facts

<table>
<thead>
<tr>
<th>Location</th>
<th>Tidö-Lindö, Västerås (Sweden)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of building</td>
<td>Single-family house</td>
</tr>
<tr>
<td>Client</td>
<td>Björn and Berit Karlsson</td>
</tr>
<tr>
<td>Architects</td>
<td>Tham &amp; Videgård Hansson Arkitekter AB</td>
</tr>
<tr>
<td>Completion</td>
<td>2002</td>
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</tbody>
</table>
IN SEARCH OF A COMMON LANGUAGE

Text by Werner Osterhaus, Symposium Co-Moderator.

To move daylighting design into the 21st century, a common and specific language is required to facilitate exchange and debate between all parties involved in the building industry, along with clearly defined descriptors of the factors responsible for achieving high-quality daylighting applications. Awareness of and easy access to detailed information on successful examples of daylighting design applications are other critical steps in this process. That is the consent reached by daylighting experts – researchers, educators, architects, lighting designers and users of daylit buildings – at a symposium in Budapest.

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There seems to be little doubt that people clearly like daylight and sunlight. They strive to create and enjoy buildings that provide plentiful and visually pleasing natural lighting. Access to good daylight and a pleasant view have almost become synonymous with high-quality buildings and good architecture. Architects attending the symposium and presenting some of their design work certainly demonstrated that they have a strong personal desire, as well as a client-driven mandate, to integrate daylighting and views to the exterior environment creatively into their buildings.

Research from around the world has also identified that good daylighting design can improve worker productivity and student learning, provide a healthier environment, significantly reduce energy consumption and improve the image of designers and building owners/occupiers as visitors will appreciate the daylight contribution.

Alessia Monauni of Austrian architecture firm Baumschlager & Eberle offered a number of projects which explored the treatment of building façades to regulate daylight and sunlight with integrated architectural elements of varying context-dependent material qualities. Her firm utilizes a layer approach often incorporating sliding panels in the exterior layer, recessed glazing elements in the central layer and curtains or blinds in the interior layer to allow the occupants to vary the amount and nature of the daylight or sunlight entering the room (Fig. 1). It would have been interesting to see how these strong architectural designs are experienced by the occupants in their daily routine.

Ivan Redi of architectural firm ‘Orto’s (without fixed place) presented his team’s desire to explore the new possibilities of the digital age in order to allow architecture and lighting design to move in new directions. Trying to recapture the skills of the old master painters, he essentially suggests that daylighting design in architectural applications is like painting with light and shadow in support of an artist’s composition to allow the viewer (or building occupant) to experience a scene or space in a particular way.

In Mr. Redi’s view, researchers’ focus too much on quantifiable aspects or final results and too little on the design process. It is during the design process that decisions are made which significantly affect a building occupant’s experience of a space. Mr. Redi also speaks of his clients’ dream of living in well-designed spaces bathed in abundant daylight and direct sunlight to provide added warmth – both psychophysically and psychologically. He wants to provide for that desire in new ways and is prepared to invest the time and join interdisciplinary teams to make it happen.

But the building users’ ‘love of daylight and sunlight’ is not unconditional, as Peter Brey, a long-time researcher and consultant on human factors in lighting design, pointed out in his contribution. Others could clearly confirm this. Despite the overwhelming general longing for daylight, buildings users will complain if things are not working well. Building occupants might experience high brightness contrasts between different parts of their visual field, discomfort from glare or veiling reflections at their workstations, overheating due to excessive solar radiation entering their space, or other problems associated with the design of the daylighting system. On the other hand, if daylight and sunlight could reasonably be provided and they are not, then people will complain about the lack of these elements.

Reasons for less-than-optimum daylighting conditions in a building might range from a lack of fully understanding the fundamental premises of daylight and sunlight as form givers in architecture to the inappropriate application of technology on the part of the designer. In addition, the lack of clear definitions and descriptors or indicators for daylight quality impedes the communication between researchers, architects, light-
ing designers, and building owners or users regarding the goals of daylighting design and how to achieve high-quality daylight buildings. Current guidelines and recommendations are frequently based on research conducted many years ago with out-dated lighting and control systems or building technology. Offices are a prime example: the critical work surface has moved from an overhead horizontal desk to the near-vertical computer screen and lighting needs have changed accordingly. These new realities require different approaches to the problem. Many assessment models cannot be adapted to include some of the current (day)lighting technologies. New models are therefore required to close that gap.

Marc Fontyoyont, leader of the daylighting research programme at the National University of State Public Works (ENTPE) in France, introduced the symposium participants to daylighting research conducted at ENTPE and within the International Energy Agency Task 31. Key aspects included results from user preference studies regarding day-lighting control systems and useful indicators of cost of light provided by different means. If one can demonstrate that good daylighting can provide cost savings compared with other measures, investors are more likely to support such design. Daylight from windows and skylights was identified as the preferred source of providing light indoors and also the most economic source with 0.35 € for skylights and 1.08 € for side windows per mega lumen hour (Mlmh) of light provided on the working plane.

Fábio Bisogni from the University of Rome addressed issues of daylighting design from the perspective of Southern Europe and particularly highlighted the connection between daylighting and solar control, a critical issue for energy conservation and human comfort in the Mediterranean region. András Majorsz from Budapest’s University of Technology highlighted the dynamic characteristics of daylight as one of the reasons why people enjoy and prefer daylight. Daylight and sunlight vary in intensity and colour throughout the day and seasons. Automated daylighting and solar control systems have been developed in response, attempting to carefully negotiate the fine line between what might be perceived by the occupants as either desirable assistance or removing all control from the users.

Jan Wiemold from the Fraunhofer Institute, Germany participated in the ECOB Build project, an interdisciplinary European research endeavour specifically looking at developing algorithms for user and climate responsive daylight and solar control systems. So far, several important aspects have been advanced through this project, ranging from better means to assess luminance mapping camera images for likely glare occurrences to the proposal of a new discomfort glare formula. Full-scale mock-up and computer simulation models of office buildings for the New York Times newspaper currently being designed by Renzo Piano’s Building Workshop in conjunction with BNL occupy much of Eleanor Lee’s time these days. The project presents a unique opportunity to assess how many factors influencing daylight quality long before the building goes into the actual construction phase. Extensor and interior façade elements, daylight and solar control systems, electric lighting integration, furnishings, and office equipment can all be tested and evaluated prior to their installation in the finished building design. Nevertheless, BNL researchers find that existing daylighting metrics are insufficient when it comes to establishing clear design parameters and assessment criteria for the many aspects of this innovative building. Visual comfort experiences often vary greatly from one person to the next. This presents a huge challenge when attempting to design a daylight system that responds to the needs of all building occupants. Nobody really wishes to relinquish control over their personal work environment to someone else. Marie-Claude Dubois, Université Laval, Canada, presented current research on assessing daylight quality in simple rooms through computer simulation. Simplicity in the geometry of the space, she says, allows the researcher to carefully assess the impact of many individual variables in the computer modelling process through parametric study. Too complex geometries make such studies difficult, as interdependence of variables clouds the picture.

Guy Newsam from the National Research Council of Canada (NRC) focused on how new knowledge on occupant responses to daylight in buildings can be incorporated into existing and new design tools. One of NRC’s research projects has tracked the movement of individual office workers to correlate their daily routine with information about the various luminous environments in which they move about. Linking both the dynamics of daylight and the behaviour of building occupants can provide new insights when assessing the daylighting performance of a building or space. Ultimately, it is hoped that design tools can dynamically evaluate various possible design scenarios.

Hamburg-based lighting consultant Peter Andrews offered the symposium participants a detailed look into his firm’s daylighting quality assessment process. Both virtual and physical models are part of the repertoire, along with many years of experience. He feels that access to an artificial sky with sun simulator is essential to study the dynamics of daylight and sunlight, especially when unusual geometries are proposed for a specific space. His clients can get a first-hand experience of a model’s interior and are able to see the impact of different design solutions. He seems to suggest that physical models are still seen by many as more true to reality than virtual models. High quality daylighting, he suggests, can perhaps be best described as the type of daylighting which is sufficient for visual task performance, visually comfortable and glare-free, visually pleasing and appropriate for the architectural and social context, well-distributed across the space, and supportive of human health and well-being.

Potential, known descriptors for daylight quality include:

- Illuminance (adaptation, ratios, contrast, distribution)
- Volumetric brightness (perceived effect of overall brightness of all room surfaces – analogous to mean radiant temperature in thermal comfort assessment)
- Luminance (ocular, vertical, horizontal, workplane, scalar, cylindrical, uniformity)
- Daylight factor (average, minimum)
- Correlated colour temperature and spectrum of light source
- Directed and diffused lighting contributions

Unfortunately, even established designers frequently apply these terms or descriptors incorrectly and without a clear understanding of the underlying concepts. Further education is obviously needed.

In addition, all of the above are still descriptors of measurable quantities, rather than quality. Designers want to know how to set design goals for daylight quality and how these goals can be approached. Good examples are an essential part of this process, as well as design tools appropriate for the complexity of the decision-making process at each step along the way. Simple tools (e.g. rules-of-thumb) are often sufficient early on. Later, more complex design tools allowing spatial (three-dimensional) and temporal (time) representation will be required to make appropriate decisions. Designers are also concerned about the extra time needed to incorporate these processes into the overall time and financial framework. And they are concerned about how they will know whether their design decisions will ultimately achieve the desired outcome, especially as they understand that different people occupying a space can have widely varying responses to its characteristics.

From lighting specialists employed by scientific and academic institutions, designers expect more design-oriented outcomes from the research conducted. In general, both designers and researchers need to ‘think more with their eyes’ than with their light metres, as Ivan Redi expressed it.

This symposium has set the scene. It has brought together participants from different fields that rarely mix and created a forum for exchange and debate. The need for a common language is obvious as there is definitely more than one viewpoint. Daylighting researchers, educators, designers and building users are not necessarily on the same wavelength – at least not yet. However, the willingness to collaborate clearly exists. It was proposed that other disciplines should also be included, especially experts in vision science and psychology. It would also be valuable to include a structured post-occupancy evaluation on the buildings they have designed to connect design and research in order to enhance our understanding of daylight quality.
Facts
The VELUX International Daylight Symposium, held on 6–7 November 2005 in Budapest, was the first international academic event to focus exclusively on daylight in architecture. 80 participants attended, representing architects from private companies, public authorities, researchers and teachers from universities and schools of architecture. The symposium included participants from 17 countries on four continents, including 13 key speakers. It was led by two moderators, Marc Fontoynont, Head of Building Sciences Laboratory, Département Génie Civil Urbain et Bâtiment in Vaulx-en-Velin (F), and Werner Osterhaus, Senior Lecturer from the Wellington School of Architecture (NZ).

Key speakers
- Marc Fontoynont, Head of Building Sciences Laboratory, Département Génie Civil Urbain et Bâtiment in Vaulx-en-Velin (F)
- Peter Boyce, Consultant, Human Factors in Lighting (GB)
- Alexia Monauri/Elmar Hasler, Baumschlager & Ebeme (A)
- Guy Newsam, Institute for Research in Construction at the National Research Council of Canada (CDN)
- Jan Wienold, Fraunhofer Institute for Solar Energy Systems (D)
- Werner Osterhaus, Senior Lecturer, Wellington School of Architecture (NZ)
- Ivan Redi, ORTLOS architects (A)
- Eleanor Lee, Building Technologies, Lawrence Berkeley National Laboratory (USA)
- Fabio Bisega, Department of Fisica Tecnica at the University of Rome (I)
- András Majjors, Budapest University of Technology and Economics, Faculty of Architecture (H)
- Marie-Claude Dubois, Laval School of Architecture, Quebec (CDN)
- Peter Andres, Light Consultant, Hamburg (D)

Visit thedaylightsite.com
The ‘Case Study Houses’ are a part of American architectural history like the famous writing on the Hol- lywood Hills. The architects who designed this unique series of ex- perimental homes have become world renowned. Charles Eames, Eero Saarinen, Richard Neutra and Pierre Koenig, to name but a few. Their buildings epitomise the essence of American architectural history with characteristic features of the area. How- ever, the architects were not only interested in the design of the buildings, but also in the way the residents lived in them. The focus was on creating spaces that were not only functional, but also aesthetically pleasing. The architects believed that architecture was not just about constructing buildings, but also about creating environments that would allow people to live in them. They believed that architecture should be an integral part of the way people live and that it should be designed to enhance their quality of life. The Case Study Houses were a platform for experimenting with new materials and construction techniques, and they helped to shape the future of American architecture.
1 GUILLERMO VAZQUEZ CONSUEGRA RECOMMENDS

1. Guillermo Vázquez Consuegra
   Title: Arquitectura de los valles andino-patagónicos
   Publisher: Gustavo Gili

2. Peter Ebner and Franziska Ullmann
   Title: Vom Institut zum Bauherrn
   Publisher: Actar
   ISBN: 3-923193-64-1

3. Nabil Gholam and Aram Yeretzian
   Title: Beirut City Center Recovery
   Publisher: Axel Mengel
   ISBN: 3-88243-978-5

PENSA LA ARQUITECTURA

Peter Zumthor is one of the prominent architects in contemporary Swiss architecture. Even in times of globalization, the architect, who was born in 1943 and is a qualified cabinetmaker, has proven his down-to-earth attitude. His work is based on the use of material and construction, not on formal trends, as well as respect for cultural heritage. Zumthor has always composed in an almost inexhaustible set of forms, which Zumthor composed during the last 30 years, in the ‘Arquitectura y Textos’ series. They form a rare and valuable testimonial to the architectural thinking of the headstrong Swiss, who has been teaching at the Academy of Architecture in Mendrisio (Switzerland) since 1996.

18 AÑOS CON EL ARQUITECTO

In this book, the architect Eugenio Canceda documents the tenure of his 18 years of work, which he carried out together with Luis Kahn, and from the numerous buildings that emerged during this time. In doing so, the Santiago Institute, the Olivetti Underwood Factory, the seat of government in Nicaragua, and the Caribbean Amusement Park are among the numerous buildings that were completed during this time. In doing so, the Santiago Institute, the Olivetti Underwood Factory, the seat of government in Nicaragua, and the Caribbean Amusement Park are among the numerous buildings that were completed during this time.

INQUIETADA TÉCNICA Y ESTRATEGIA PROYECTUAL

Rafael Moneo has dedicated a large amount of his time as an architect to teaching and architectural criticism. In this book, which developed during a lecture course at the Harvard Graduate School of Design, Moneo assesses the works of eight contemporary architects and their theoretical positions. The 704 page book contains 56 essays on Space and Science in which Peter Zumthor and Axel Mengel answer these questions in an amusing way, but never-theless with great depth.

BEIRUT CITY CENTER RECOVERY

For probably the first time, Friedrich Rapf applies his book systematically presents traditional residential architecture from all 15 countries in the region.

LIVING UNDER THE CRESCENT MOON

In this book, the architect Eugenio Canceda documents the tenure of his 18 years of work, which he carried out together with Luis Kahn, and from the numerous buildings that emerged during this time. In doing so, the Santiago Institute, the Olivetti Underwood Factory, the seat of government in Nicaragua, and the Caribbean Amusement Park are among the numerous buildings that were completed during this time. In doing so, the Santiago Institute, the Olivetti Underwood Factory, the seat of government in Nicaragua, and the Caribbean Amusement Park are among the numerous buildings that were completed during this time.