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## **WHAT IS SUSTAINABILITY?**

Sustainability is a big, if not overwhelming, concept. However, it is not beyond comprehension. I would like to talk about my visual aesthetic, my methods, questions and answers which arise in my work, teaching and research in relation to this topic.

## A SINGLE VIEWPOINT VS. SIMULTANEOUS REPRESENTATION

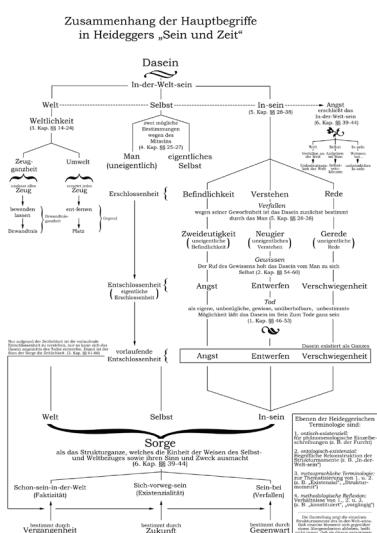


Pablo Picasso, «Les Demoiselles d'Avignon», 1907  
The Museum of Modern Art, New York  
© 2014. Foto Scala, Florence

We are looking at “Les Demoiselles d’Avignon”, painted by Pablo Picasso in 1907. At this time, the conviction established itself in painting that it is inappropriate to perceive a picture as a purely illusionist representation. Since the Renaissance, three-dimensional objects and their position in space had, after all, been represented by means of the illusion of perspective with an objectivist viewpoint. Cubism argues that the picture itself is reality, not simply the two-dimensional illusion of a three-dimensional reality. Perspective is replaced by simultaneous representation of the objects in the painting from different viewpoints. However, the painter, and thus the viewer, retains their objectivist position. Throughout its whole epoch, Modernism never abandons this aloof objectivist perspective of the world. On the contrary, scientific progress further emphasises the distance between humans and natural reality.

## **FROM OBJECTIVISM TO SUBJECTIVISM**

Martin Heidegger wrote *Being and Time* ("Sein und Zeit") in 1927. He rigorously eliminates the objectivist attitude of the philosophy of the last two and a half thousand years by placing man in the centre of contemplation and describing the world from this perspective. He does this by attributing human action to the subjective feeling of preoccupation with one's personal death. Even though he himself later criticised this focussed approach of deriving all human action from a preoccupation with death as being too limited, he does overcome, at least philosophically, the idea of distanced objectivism.



Martin Heidegger «Sein und Zeit» 1927

TO BUILD = TO SUSTAIN = TO BE

I would like to offer a new interpretation of the much-cited text by Martin Heidegger from the 1951 "Darmstädter Gespräche" symposia, Building, Dwelling, Thinking ("Bauen Wohnen Denken"). From the Old High German word "buān", he establishes a connection between building and the primal concept of being. On the one hand you have the farmer ("Bauer") tilling the field, and on the other the builder (also "Bauer") building a house, but also the verb "sein" (in its English form "to be"), still recognisable in the first person German form "ich bin" – all these originate from the word "buān".

The self-conception of civilised man is rooted in this moment in which our ancestors developed from hunters to settlers. The field is equivalent to the house in this context. After all, both the nourishment gained from cultivated land and the

protection rendered by a house were, and still are, essential for survival. Both activities establish a relationship between man and his natural environment. Nothing has changed in this to date, except that the division of labour has caused us to lose the direct relation to natural resources critical to our survival.

The English word “sustainability” originates from the verb “to sustain”, which means “erhalten” in German. On first consideration, this means to preserve what has been created, but in truth it means to survive, because what has been created and its maintenance is important for human survival. Sustainability is a subjective concern of humans and of humanity in general. Sustaining is the essence of being in the present day.

## THE CONCEPT OF SUSTAINABILITY



Pilgrims at Mount Kailash, Tibet  
© Lama Chodrak, 2006

To return to simultaneous contemplation: the subject of sustainability is so wide-ranging that it presents itself differently depending on the various viewpoints, the various methods of contemplation and the various categories of assessment. This often makes it impossible to grasp.

Just think of a mountain that presents itself differently from various angles. A climber will describe it differently to a pilot in an airplane.

A pilgrim visiting Mount Kailash will take a different view than the geologist Hans Conrad Escher at the Glarus thrust.



East view of Tschingelhoren with Martinsloch,  
Aquarell  
Hans Conrad Escher, 1812  
© Graphische Sammlung ETH Zürich

Sustainability simply describes the relationship between humanity, as well as the human individual, and their reality – the world. It is neither ideology nor science. On the other hand, both science and idealistic contemplation influence our relation to the world.

## MODELS OF SUSTAINABILITY

### The three pillar model: Ecological – Social – Economic

“Ecological” describes the relationship between man and nature. Remember Heidegger’s derivation from building to being, from being to nature. The ancient Greek origin of “eco” is “Oikos”, meaning house or household, including the associated agricultural land. “Logos” refers to the theoretical study thereof.

“Social” describes the relationship between man and his fellow men. This can also be deduced from the archaic origin of being (“Sein”). The builder (“Bauer”) building next to me is the “Nachgebauer”, the “Nachbar”, the neighbour. The Latin root is “Socius”, signifying companion.

“Economic” describes the relationship between man and his values. It’s not hard to recognise that by settling, humans start to gather, exchange and assess values. Here too, the beginning of the word is derived from “Oikos”. It is only the ending “Nomos”, meaning law, which changes the meaning in comparison with ecology, and introduces man-made principles.

## The Meadows model – The Limits to Growth

Commissioned by the Club of Rome, Donella und Dennis Meadows presented a system analysis and computer simulations at the St. Gallen Symposium of the HSG (University of St. Gallen) in 1972 to illustrate the limits of human population growth. The central conclusions of the report were: If the current increase in the world population, industrialisation, pollution, food production and exploitation of natural resources continues unchanged, the absolute limits of growth on earth will be reached within the next hundred years.

## The ecological footprint model

Every single person's lifestyle is considered in relation to the required area of the earth's surface and its biocapacity. The modern requirements of mobility and consumption are added to the archaic requirements of human existence, dwelling and food (remember Heidegger's analysis of the concept "buan"). All four sectors of the footprint are about equal in size in the industrialised world.

## My personal model – Matter, Space and Time



Heraclitus of Ephesus  
c. 520 BC; † c. 460 BC  
Raffaello Sanzio, 1509-10  
La Scuola di Atene, Stanza della Segnatura, Musei Vaticani  
© 2014. Foto Scala, Florence

We are looking at Heraclitus of Ephesus in the shape of Michelangelo, detail from Raphael's The School of Athens (1510–1511), fresco in the Stanza della Segnatura, Vatican.

Being ("Sein") is the process of becoming the whole. Being is therefore not to be understood as something static, but dynamically, as an eternal state of transformation. Yet behind, and at the same time within the perpetual flow there is unity: unity in multiplicity and multiplicity in unity.

Matter, space and time constitute the infinite physical parameters of reality. Human existence ("Dasein" – literally, being-there or being-here) on the other hand is limited to our natural environment: the earth. Human creative activity brings about the transformation of matter within the space-time continuum. As a result of the global biocapacity of our earth being exceeded through human action, what was considered from time immemorial to be an unlimited possibility of being ("Sein") may come to an end – we are approaching the limits of our own reality. The fact that we are not confronted by this on an everyday basis is attributable to the material storage capacity of the earth's crust, the relatively high tolerance of our natural surroundings, as well as the globally and economically unfair distribution of all resources. This "borderline experience" is an absolutely singular event in human history. There are therefore no simple recipes for counteracting this phenomenon of imbalance between human consumption and the capacity of our planet. The transformation of the world, as an action which is inalienably inherent in human nature, has to be controllable and integrated in a sustainable equilibrium with the biocapacity of our planet. Responsible for 40% of global energy consumption and 60% of global real values, the building-related sciences hold a key position in this respect. The architect is virtually a master of this transformation.

The physical quantities of matter, space and time offer orientation in the building sciences. In short, the challenge facing future architectural creativity is: consume less matter/energy, require less space, but last for a longer period of time. This is achieved through efficiency in construction engineering, density in urban development, durability in building construction – the new/old standards of sustainable building.

### SELECTION OF MY BUILT WORK

I'd like to show you some projects from my personal work as an architect in relation to the aforementioned physical dimensions. Just as the three dimensions are mutually interdependent, the same applies to sustainable building. No project can be reduced to a single theme.

#### MATTER/ENERGY > EFFICIENCY



#### Residential Development Eulachhof, Winterthur CH, 2007

The urban concept was defined by the architect Jean-Pierre Dürig: residential and commercial uses are defined in hybrid-cluster buildings. On a former industrial site a new residential district was erected with large scale buildings. Here we were able to realize the milestone „first large-scale-project in the Minergie-P-Eco energy standard“ of Switzerland. It was built in a hybrid construction (supporting structure in massive concrete construction, the building envelope in a highly insulated wood element construction). For the tectonic expression we looked for a relationship between the existing brick industrial buildings. The disposition of the floors and the horizontal ribbons of the wooden formwork contribute to the aesthetic appearance.

After completion we asked ourselves the question: is the city of the future a wooden one?

The energy concept was developed in collaboration with Professor Hansjürg Leibundgut from ETH Zurich. This energy-efficient building could be realized with a very simple concept: close all media circuits loosing as less energy as possible. In

the project fresh air, hot water, but also waste where integrated into closed loops. Heat pumps and a nearby district heating system ensure that the heat is recovered. A photovoltaic system on the roof generates electricity and feeds it into the public electricity grid.

The result is a project with an even energy balance, a pilot project for a building with a zero energy concept on a large urban development site.

## SPACE > DENSITY



### **Urban Development Neugrüen, Mellingen CH, 2014**

In the context of the rural agglomeration architecture of Mellingen, the settlement "Neugrüen" is the first residential development in Switzerland with the energy standard Minergie-P-Eco and A-Eco. The small town on the river Reuss has been extended with a new, coherent district constructed in timber, a neighborhood with the character of a naturally grown village. From the beginning, a mix of housing was carefully selected to meet the needs of the new residents – young singles, families, silver agers – and to provide them a home. At the entrance of the settlement, the street space expands to a large square with café – the social meeting point. The urban composition consists of terrace houses with split-level conception, tall blocks and a larger ensemble on the main road with flats and local commercial spaces on the ground floors. Despite the regular grid many exciting and diversified spatial sequences have been created. The settlement area has a comfortable scale and a density with a utilization factor of 1.0.

The energy concept follows the strategies for energy efficiency: well-insulated façades, well-balanced building technology, own energy production and recovery. For its operation, there is no additional energy required. A photovoltaic system operates the heat pumps, a heat recovery system with a heat exchanger utilizes the energy of the used hot water and feeds it back to the buildings.

The result is a settlement offering a variety of meeting spaces to the residents. By using high value materials and a rich detailing, the architecture creates a new identity and a home – so a new neighborhood can evolve.

## TIME > DURABILITY



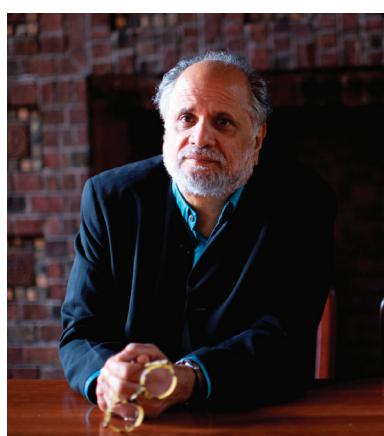
### **Residential Building „am Rietpark“, Zürich-Schlieren CH, 2013**

In our project «am Rietpark» the energy standard Minenergie-P-ECO was applied for the first time in a high rise building. The challenge was to achieve an optimized solar gain through the building envelope, while avoiding overheating during summer months and minimizing transmission loss in winter. The result is a masonry building, assembled from large concrete elements, with a well-measured window proportion to achieve passive solar gains. Appropriate to the material used, the constructive ornament results in a fine tectonic, which lends the façade a liberating elegance. In the new urban space the iconic building creates identity, it is rooted to the site, it is timeless.

The aesthetics of sustainable building design is characterized by durable materials and manifests a building culture of durability.

## WHY SUSTAINABILITY?

### **EVOLUTIONARY PROCESS – STRATEGIC INTERVENTION OF INTERESTS – THEOLOGICAL MATTER**



Homi K. Bhabha  
Professor at Harvard University

In his 2010 article “Mumbai on My Mind: Some Thoughts on Sustainability” , Homi K. Bhabha, Professor at Harvard University, asks the following question:

Is sustainability an evolutionary process, a theological task, or a strategic, interstitial intervention into fragile and fractal reality that we call the urban environment?

His answer is that all three aspects are crucial. The question here is not just ‘How?’ but also ‘Why?’.

In every act, the ‘Why’ comes before the ‘How’. The Why provides guidance, especially in a technical discussion where we tend to get lost in details. In the case of an evolutionary process, there is little to question: the stronger will survive, the better technology will prevail, or humanity itself will decline in numbers; one can only wait and hope to be among the privileged survivors. Amazingly, this passive fatalism is widespread within the architecture community, given that the second

position of strategic intervention of interests appears uninspiring or deterrent, and the theological aspect obsolete. The strategic intervention of interests is very closely related to the evolutionary process if it merely holds the strongest possible position in the global chess game. However, this approach takes on a completely different thrust if one admits one's own economic deficits in relation to the sustainable society and draws the necessary conclusions.

### **STRATEGIC RELEVANCE**

Every society has to deal with its own deficits and corresponding challenges in terms of sustainability. Thus, there is no global solution; rather, specific local solutions are required. For Western societies, these involve:

- Maintaining security of supply in terms of raw materials and energy by increasing efficiency in relation to energy consumption and the generation of renewable forms of energy.
- Putting a stop to the shrinking of the countryside, the fundamental resource of our natural being, due to the sprawling expansion of built-up areas.
- New concepts to address the socio-economic effects of the aging society, which are the results of our shrinking society. However, this represents a positive effect in relation to the 7 billion people on the planet.
- The coexistence of a multicultural society and the establishment of an open homeland for people seeking refuge from global injustice, but also for workers following the globalized economy.

### **CULTURAL TRADITION**

As regards the theological aspect, or rather, as we are more likely to see it in our enlightened and secular society , the idealistic position, the fact is that the ideal is indisputable and does not ultimately require our rescue. It involves the preservation of our own human existence. For this reason, all religions in the world have established pragmatic rules for living which were derived from the sum of historical experience. This traditional wisdom is remarkably consistent in the answers it offers to the “borderline experience” described above, i.e. reaching the limits of our own reality.

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