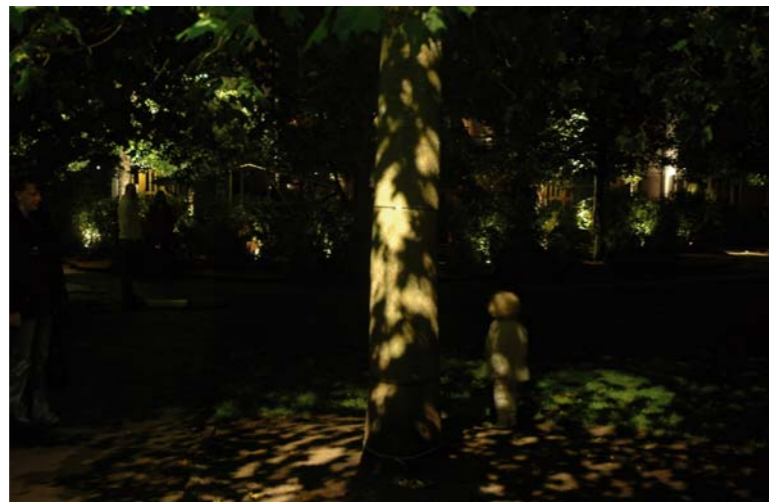


Lighting design, shadow design

The power of lighting and shadowing.

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Light and shadow as written or spoken words first come across as opposites. As such they are equally weighted. In reality they are dependent on one another – the one determines the other.



Shadow effects during daytime in a wood (top left) and shadow effects created with electric light during a PLDA workshop in Alingsås/S. The team was working on a social housing estate. The high-quality temporary lighting installations were not vandalised in any way. Workshop team headed by Erik Olsson and Jöran Linder.



Self-shadows and their significance for our understanding of space.

describe this as different levels of light. Is the way we perceive shadow dependent on the culture we stem from? The fact that the two words exist the world over, and are always spoken of as contrasting elements, would appear not to endorse this idea. Whatever language they speak, people all over the globe have been making references to this pair of opposites since time immemorial: light or brightness as a symbol of what is good, or divine, and shadow or the absence of light, and darkness as a symbol of all things evil.

Silhouettes and shady characters definitely promote a different message from that of shining apparitions or bodies that radiate light. The former have something dark and mysterious about them. Dark figures are often characters that possess no shadow, which immediately makes them inhuman and unnatural. Shadow is therefore a part of our real human existence.

Leading lights and shining apparitions we consider to be supernatural, godly even. They are surrounded by a glowing aura and they are never associated with shadows. Their knowledge is based on light, which in turn enlightens the darkness. When we understand something we often say it has been "brought to light". What we do not know remains



Reflections and shadow effects in nature (left) and an installation in a parking garage (right). The layering of different luminous intensities generates sections of shadow. Results of a workshop on lighting car parks in Lüdenscheid/D. Workshop team headed by Thomas Mika, PLDA.

"in the dark". In many languages, birth is described as "giving light" or the baby is "given to light" or actively "first sees the light of day". When someone dies, his life is "extinguished". Death usually comes upon us at night when a part of the earth is hidden from the sun, a shadow moving over us.

In all these turns of phrase the physical and metaphysical layers merge to become one.

All cultures show signs of fascination with the enigmatic aspects of shadow. Shadow plays are a tradition in many parts of the world. It is exciting to toy with the human perception of something that is two-dimensional and mysterious because that something is not material. Shadow cannot be described as an object or thing. It is indeed immaterial. A shadow needs an object, or the interpretation of an object in the eyes of the viewer, in order to exist at all. Contemplating shadows is like sketching in a way: a three-dimensional object is rendered two-dimensional so that a viewer can re-interpret it again as something three-dimensional.

Physically speaking, shadows help us to orient ourselves. They facilitate the analytical process of visual perception and contribute towards our understanding of how spatial bodies are positioned. This process occurs on a low level of perception, that is to say unconsciously. The more pre-

cise a shadow is, the less mysterious it appears to be. The more independent the shadow is from the object it refers to, the more mysterious it becomes, and the further it slips into the metaphysical realm. Shadow generally marks the lower parts of objects since light naturally comes from above. Artificial light from below thus always comes across as unnatural. This is especially true when the surrounding brightness is low. In the natural way we see things the upper visual hemisphere is much brighter than the lower one. The human eye is geared towards a horizon brightness that comprises a higher sensitivity to light in the section below the horizon. Besides this innate visual phenomenon our perception provides us with a system that allows us to recognize shadows and what they mean. When in doubt we interpret shadows as projected downwards – in line with our experience of natural light. A shadow normally originates from the base of an object. If this is not the case, the object will be perceived as floating. The light source is presumed to be located above us, from the angle of the sun at 11 am to be exact, although there is no physiological explanation for that. In its two-dimensional state, a shape is always interpreted in this way. This effect is also valid for things we know well and whose alignment to our viewing standpoint we are already



aware of. When we look at a face we know that a nose protrudes from it. If the face is presented in a way that is puzzling or unnatural to us, we first presume that the light source is different from what we are used to rather than question our knowledge of what a face with a nose looks like! The analysis of spatial situations is handled at a higher level of percep-

tion, at the cognitive, conscious level, which also includes the perception of shadows in the architectural space. The cast shadow generated by a thatched roof or a canopy of leaves provides protection from the midday sun. Shadow thus creates space.

Architects who deliberately include shadow in their designs pro-



Shadow effects on mountains and reflections of shadows in the adjacent lake.



The natural interplay of light and shadow through the leaves of a tree (left), and the play of shadows created in a workshop installation by night in Alingsås/S. Workshop team headed by Niklas Ödmann, PLDA.



duce some dramatic architecture. The work of Tadao Ando, the modern Japanese daylight architect, is not typical of the way the Japanese traditionally work with light and shadow. In traditional Japanese houses translucent paper screens filter the light so that the shadows inside the space are soft. It is not that the direction the light comes from is eliminated. That is still very much in evidence. But the light entering the space is softer and more diffuse. That is why Japanese eyes are more sensitized to very fine gradations of light and shadow. In Ando's architec-

ture the shadows are sharp and clearly contoured. His buildings are designed to change as the incident light changes.

Ando claims: "Creating space in architecture is no more than intensifying and refining light". For him, light and shadow are also complementary phenomena. He sees darkness in the nature of shadow, and brightness in that of light. Designing light and shadow in architecture means creating spatial structures with the aid of shadow; and it means using perception from above and below taking incidental light into consideration. It is natural for us to perceive the lower part of anything as darker, which is why we find this kind of dispersion of brightness inside buildings pleasant and acceptable.

Modern architecture tends to favour extensive glazing and does not really address shadow in its design.

One might go as far as to say shadow is not a consciously perceived part of the design. Glass architecture would appear to be perfect for allowing daylight to penetrate the building, which theoretically is definitely the case. In practice, however, solar protection devices installed to promote the well-being of the users literally prevent it. The result is the diffuse, uniform illumination of the entire interior space. Light and shadow no longer shape the space. Every corner of the space is unobtrusively filled with diffuse light, contours become blurred, shadows disappear. It becomes difficult to pinpoint where the light is coming from, thus hindering orientation and undermining our sense of time. Any natural tension inherent to the architecture is lost. Other means of orientation must be found. Designed electric light rightly comes into play to fulfil what has become one of its major tasks.



What impresses us more? The shadow or the original?

is more daylight calculation than anything else. The depiction of incident daylight is achieved by means of off-colour diagrams. The intellectual examination of incident daylight and the natural formation of shadows are no longer pursued as part of the design process. Instead of including light and inherent shadow as integral to the initial design phase, these aspects are often analysed much later, frequently in the form of a technical evaluation.

The poetry contained in a shadow, and the true character behind shadow, are lost!



The poetry of shadow during daylight hours...



... and the poetry of light that evolves thanks to the shadows, or is it the poetry of shadows that evolves thanks to the light. Sometimes magic can be added to a pedestrian bridge using simple shadow techniques.

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Architectural photo courtesy of the Hotel Ganzseecort.