

On the phenomenology of shadow

"Phenomena are the vision of what is not manifest."

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In Plato's allegory of the cave the prisoners who had been chained and held immobile since childhood perceived the shadows generated by the fire in the cave as autonomous real things and not reflections of things. In the parable they believe that what they see is reality, and that the shadows are indeed autonomous beings. Any attempt to contradict them or invalidate what they believe to be true is met with vehement protest.

The above allegory, which is part of Plato's work "Politeia", succeeds in showing us how we partake of the world of ideas and thus convinces us that the world we perceive through our senses is subordinate to an invisible world of ideas. If, however, the "idea" of a fragmentary apparition of shadow, with respect to existence as a

whole, can be gained from a mere idea of being, thus shadow can represent the vocabulary of minimalist light art.

Paradoxically, shadows are able to transmit more content with less information: the content of the light contained within the shadow, which is implied by shadow and yet not revealed by it. According to Herakleitos the mysterious quality of shadow decrypts nature's intent: "I physis kryptesthai phili" (nature likes to hide itself). Shadow is the "natural" phenomenon par excellence.





On the spontaneous interpretation of shadow phenomena

Shadows are usually identified as such when they are compared with the original object. The simultaneity of the rendition of the original object with its shadow in our field of vision allows us to perceive the shadow as the occurrence of interactivity between light and matter. In this context shadows render the objects in a dematerialised form.

The similarity of the phenomenon of shadow to the distorted form of the original object is a key feature of shadow, and the reason why it is known as such. Shadow is not merely darkness, but darkness with form, infiltrated into light. Although with regard to the spontaneous interpretation of shadow phenomena it would be plausible to make any word a feature of the darkness of shadow, it makes sense at this point to explain that this feature has more to do with the operative definition of shadow and does not correspond to the truth as long as the light from a light source, on its way to the surface that is waiting to receive it, does not project the shadow of more or less transparent air. This light projection is nevertheless not interpreted as shadow. It lacks the requisite darkness.

Paradoxically we recognise the immanent darkness of shadow, but not necessarily its potential to darken a brighter field. We can simulate this effect with the aid of an experiment based upon the principle of light constancy (see Figure 1). The shadowed box B appears to be brighter than box A, despite both boxes being identically bright. The shadow itself may appear dark, but

is not capable of convincingly darkening box B. The shadow is perceived as being an independent phenomenon. It is ascribed darkness, and according to this association we are free to discover the genuine reflective capacity of box B without hindrance.

But when a light projection or shadow projection of transparent air, as described above, is outlined by a harsh contour, as is often expected and often happens with shadows, it is still insufficient to be able to at least term it a negative shadow. Even the dark periphery is not perceived as shadow. The shadowed surface, in accordance with conventional, common expectations, must be introverted. A centrifugal expression of darkness, or the overlooked shadow surrounding the projection of an empty slide frame can at the most be designated as being a pronounced form of "vignetting". Is that not a representative example of

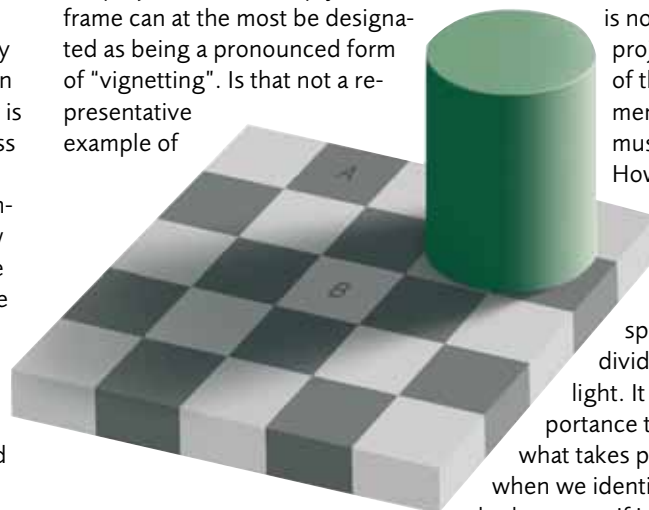


Figure 1.

our unconscious timidity of shadows? Or for our indifferent regard of them? Simone Weil justifiably ascertained that "advertency is the rarest and most genuine form of generosity".

Our perceptive faculty is apparently characterised by certain stereotypes. Hence coloured shadows are alluded to when coloured light is superimposed onto dark shadows. This often occurs today with RGB luminaires: despite the presence of dominant white light in the centre of an illuminated object

stemming from inconsistent overlapping of the three coloured components, the luminaires create coloured shadow contours. The chromaticity of shadowless, superimposed light is thus recognised as an inseparable characteristic of the shadowed surface. But discussions dwelling upon the shadowing of coloured light are generally avoided. Of course the transposition of such phrases are connected with the overlapping effect of the light components. There exists no light without shadows, and no shadows without light. And no colour without light. Because what is the coloured light projected through a deep blue, dichroic filter if it



Figure 2.

is not a shadowed projection of the light of the yellow complementary colour that must remain behind? How we describe the shadow is of little interest compared to the fascination sparked by each individual apparition of light. It is of greater importance to understand what takes place inside us when we identify light as being shadow, even if it is not shadow in reality.

Of course there are many examples that substantiate how often shadow is not seen as such, but it is not the aim of this short article to enumerate them. However, let us take a last look at a typical example of the spontaneous interpretation of shadow as an apparition of plasticity: the variations of brightness on the surface of a sculpture (see Figure 2) are not depicted as shadowing. In certain respects this is more correct than a description of the deceptive discrimination between light and shadow. The photometric law of distance specifies

the dependence of illuminance or intercepted light upon the orientation of the surface to the respective light source. There are thus always variations of illumination between surfaces of a sculpture that meet at an edge, depending upon the angle of each surface to the light source. If the sculpture has no edges and merely features curves, variations of illumination occur according to more gentle gradations, without abrupt changes of brightness. In this way the effect of plasticity seems to be more genuine. If on the other hand the brightness values of two surfaces of a

sculpture intersecting at a sharp edge differ, our impression is more akin to the appearance of shadow. In such cases the edge represents the shadow contour that is typically representative of the phenomenon of shadow, and that ascribes a "phantom shadow" together with the darkness stemming from the contrast to the brightness of the adjacent surface. In other cases the plasticity of a sculpture is emphasised by real shadowing. If for example a part of a sculpture is positioned between the light source and another part of the sculpture, the latter part is cast into shadow and apparently darkened with the appropriate direction and geometry of light. Within this darkened field cast in shadow, light reflections from reflective surfaces of the sculpture appear more intensive due to heightened contrast from shadowing. Shadows therefore manifest reflections of light that would otherwise go unnoticed. They appear before their surroundings are darkened with shadow, due to the contrast level lying at the border of our sensitivity for luminance distinction that permits the light of reflections to shine and glow uninhibited.

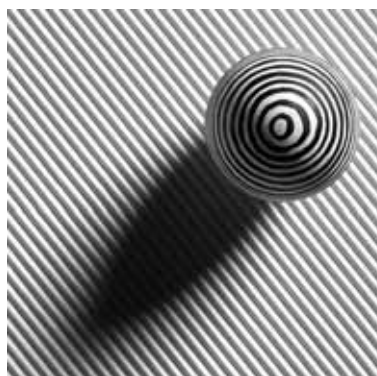


Figure 3.

Shadows can therefore be understood as being either real occurrences of light or misleading light impressions according to the light context that is of course undoubtedly superior to any lighting concept.

Phantom appearances and visions of shadow

Appearances of shadow are obviously not independent apparitions of light. Even the so-called "intrinsic shadow" is existentially dependent upon the effect of a light source. Shadows belong to light and obey its laws, in particular the linear radiance of its beams that dictate the direction of shadows. In this respect, every shadow can be assigned to a specific direction of light. The light direction is however generally recognised by the form and position of the shadow itself, as the distribution of light itself remains invisible until it meets an object lying in its way. Perception of light direction is therefore closely associated with the interpretation of shadow. As long as the shadow occurs alone in our field of view, it is automatically assigned a unique and explicit light direction that of course characterises the behaviour of the light source as a whole. Thus the hatched background of the shadowed area in the Vassarely work (see Figure 3) appears to be textured. The parallel nature of the direction of the grey lines, combi-

ned with the prevailing direction of light that dominates the hard shadows, leads us to perceive the contrast between the white and grey lines as being shadow. Cognitive perception therefore makes us see phantom shadows that in reality do not exist. In effect, the hard shadows of the spherical object, furnished with an alternating pattern of black and white rings, does not represent shadow in itself. It is only really a matter of the printed image of a shadow that lends the work its impression of perspective depth. This misleading sense of depth however remains a conventional phantom effect that is able to trigger a "shadow signal" in our perceptive capabilities.

On my last trip to Cyprus I had the opportunity to visit an exhibition of photographs. One photo in particular (see Figure 4) immediately attracted my attention, because for a short space of time I had the impression that the spot of light on the forehead of the girl was caused by uneven mounting of the photo to the wall in combination with the angular light emission of a halogen spotlight installed to the side. This however turned out to be a deception, because in reality the spot of light had been reproduced by the



Figure 6.

photo. It lent the rest of the poster the impression of being rendered in apparent shadow. The sun, similarly radiating beams of light from the side, was not to be seen on the image. The halogen spot in this constellation was able to "synchro-

nise" the sun in this respect and serve as a faithful rendition. This example demonstrates the disparity between artificial light and light art. The adept handling of phantom aspects of light, or the development of an intentional appreciation of light reality and our physiologically determined subjectivity are achievements that can only be attained through our struggle for the veracity of light. Light art can be the result of this. On the other



Figure 4.

hand, it cannot be attained by the desire for show and spectacle.

Apparent shadow is the result of cursory observation. With limited time for viewing, the zebra pattern of the carpet (see Figure 5) can also be perceived as being the shadow of the stair railing. Our sense of vision is preconditioned with specific



Figure 7.

expectations and in this respect is inevitably prone to illusion.

These expectations, linked to that which is already known, help us to recognise what is correct, even in cases where appearances themselves only have an illusory

effect upon our vision. The profile of a face backlit with a sunset has no plasticity. The glare robs us of the ability to recognise fine gradations of luminance on the surface of the face. All parts of the face appear to be uniformly dark and the viewer is presented with a vision of shadow. His only defence against the chicanery is knowledge of reality.

Interpretations and intimations of shadow

We can assure ourselves with a high level of certainty that the importance of shadows is attributed more to the perception that they elicit as such, rather than the particularity of their manifestation. Shadows draw attention to the protective nature of a roof, or render a sense of homeliness to spaces for living. Their effect is related to the entirety of our existence and not only to our sense of vision.

Shadows are the benefactor of art in black and white. Without them, the art of shadow puppetry and its richly inspired successors, including the animation films of Lotte Reininger (see Figure 6), would hardly be possible. The figures in black are flat and, in relation to the light, equally important. Racism and colour barriers have no place in a world of art dictated by shadows.

Cinematic works of the film noir category (see Figure 7) use shadow for conjuring up a sense of the mysterious. Shadows compel the audience to ponder. Firstly, the steps of a man are heard ascending the stairs, then we are able to see the first traces of his physical presence, a shadowy fragment. We await his arrival. Shadow therefore takes on the role of an elementary phase of the story, making it compelling, giving it a sense of suspense.

What we are able to admire most though is the effortlessness with which shadow enters our lives, its boundless softness that enables the assumption of an enormous diversification of forms within a short

space of time, and of course the fleetingness of these forms according to the direction of light and the orientation of the surfaces that accommodate them.

A representative example of such an application is the projection of the poet for the cultural capital of Europe for 2006 (see Figure 8) upon a climbing staircase. At its upper end the shadowy figure gradually disappears into the gloomy heights.

Shadows serve to educate our sense of perception with the most varied manifestations of light. Their most important contribution to the development of a lighting designer lies therefore not in the availability of a tool for design, but more in encouraging our proficiency in the art of observation, and to make ourselves more aware of the polyvalence involved in the perception of shadow; in fact, how indulgently we see things.

The lighting designer endowed of a finely-tuned sense of shadow acquires the skill to interpret his visual environment after having tamed his initial reactions and spontaneous impressions, and conscientiously questioning the latter.

This is why it makes sense in this age of communications to reinvestigate the role of shadow in modern lighting theory.



Figure 8.