

performance. Luminance technology can also be regarded as a step in the right direction; the expansion of the design analysis from the visual task to the entire space and the development of zone-oriented lighting design all make for progress, and in turn have a positive effect on the quality of the lighting.

Even if lighting solutions can be achieved using quantitative processes that are acceptable within the broad spectrum of visual adaptability, it does not mean to say that lighting has been designed that will comply with all essential perceptual requirements. Both quantitative lighting design and luminance technology remain at the level of purely physiologically oriented design, which does not provide any reliable criteria apart from the isolated consideration of visual tasks. Luminance technology is equally not able to keep both promises – the designer's prediction of what the visual effect will be and the creation of (perceptually speaking) optimum, "stable" lighting situations; it is therefore not realistic to lay down a set of abstract criteria for brightness distribution that do not relate to a specific situation.

3.1.3 The principles of perception-oriented lighting design

The main reason for our dissatisfaction with lighting concepts based on quantitative lighting design or luminance technology is the fact that they adhere strictly to a physiologically oriented view of human perception. Man is only seen as a mobile being for processing images; his visual environment is reduced to the mere "visual task", at the best to an overall perceptual understanding of "table" and "wall", "window" and "ceiling". Seen from this angle, it is only possible to analyse a minor portion of the complex perceptual process, which comprises the eye and an abstract comprehension of the world around us; no attention is paid to the person behind the eye and the significance of the perceived objects.

Only when we begin to go beyond the physiology of the eye and take a closer look at the psychology of perception can the conditions required for the processing of visual information be fully understood and all the factors involved in the correlation between the perceiving being, the perceived objects and light as a medium for allowing perception to take place be taken into account. In a concept that understands perception as more than a process for handling information, the visual environment is more than just a configuration of optically effective surfaces. In this way both information content and the structures and aesthetic qualities of a piece of architecture can be analysed adequately. Man is no longer seen as merely recording his visual environment, but

as an active factor in the perceptual process – an acting subject, who can construct an image of a visual environment based on a wide variety of expectations and needs.

Only when two main factors are correlated – the structural information provided by a visual environment and the needs of a human being in the given situation – does the so-called pattern of significance of a space develop. Only then is it possible to analyse the ranking of importance which relate to individual areas and functions. On the basis of this pattern of significance it is possible to plan the lighting as the third variable factor in the visual process and to design it accordingly. The need for orientation aids varies radically depending on the type of environment – light applied for guiding people through spaces can be of prime importance in a congress centre with constantly changing groups of visitors, whereas this task is considerably less important in familiar environments. The decision whether to graze the surface structure of a wall with light depends on whether this structure presents essential information, e.g. about its character as a mediaeval stone wall or whether such lighting will only reveal the poor quality of the plaster work.

Perception-oriented lighting design, which is directed at the human being and his needs, can no longer be directed in primarily *quantitative* terms relating to illuminance and the distribution of luminance. To achieve lighting that is suitable for a given situation it is necessary to develop a set of *qualitative* criteria, an entire vocabulary of terms, which can describe the requirements a lighting installation has to meet and comprise the functions of the light with which these requirements can be fulfilled.

3.1.3.1 Richard Kelly

A significant part of this task – a basic description of the various functions of light as a medium for imparting information – was developed in the fifties by Richard Kelly, a pioneer of qualitative lighting design.

Kelly describes the first and basic form of light as *ambient light*. This is the light that provides general illumination of our environment. It guarantees that the surrounding space, plus the objects and persons in it, are visible. This form of overall, uniform lighting ensures that we can orient ourselves and carry out general tasks. It is covered to a large extent by the ideas underlying quantitative lighting design, except that ambient light in the Kelly sense is not the aim of a lighting concept, but only a basis for further planning. The aim is not to produce overall lighting of supposedly optimum illuminance, but differentiated lighting that can be developed taking ambient light as the basic level of lighting.

To achieve differentiation, a second form of lighting is required that Kelly refers to as *focal glow*. This is the first instance where light becomes an active participant in conveying information. One important aspect that is taken into account here is the fact that our attention is automatically drawn towards brightly lit areas. It is therefore possible to arrange the mass of information contained in an environment via the appropriate distribution of brightness – areas containing essential information can be emphasized by accent lighting, information of secondary importance or disturbing information toned down by applying lower lighting levels. This facilitates the fast and accurate flow of information, the visual environment, with its inherent structures and the significance of the objects it contains, is easily recognised. This also applies to orientation within the space – e.g. the ability to distinguish quickly between a main entrance and a side entrance – and for the accentuation of objects, as we find in product displays or the emphasizing of the most valuable sculpture in a collection.

The third form of light, *play of brilliance* is a result of the realization that light not only draws our attention to information, but that it can represent information in itself. This applies above all to specular effects, such as those produced by point light sources on reflective or refractive materials; the light source itself can also be considered to be brilliant. This “play of brilliance” can lend prestigious spaces in particular life and atmosphere. The effect produced traditionally by chandeliers and candlelight can be achieved in modern-day lighting design through the purposeful application of light sculptures or the creation of brilliance from illuminated materials.



Richard Kelly, one of the pioneers of modern lighting design. In projects designed by leading architects, e.g. Mies van der Rohe, Louis Kahn or Philip Johnson, he developed the basic principles of differentiated lighting design, influenced by stage lighting.