

## **SEMIR ZEKI**

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Semir Zeki held the Chair of Neurobiology at University College London from 1981 to 2008 and has been Professor of Neuroesthetics there since 2008. His primary interest has been in studying the organization of the primate visual brain, which he has shown to consist of many distinct visual areas that process different attributes of the visual world such as form, colour and motion, separately and in parallel but asynchronously. More recently, he has started to enquire, in addition, into the affective states generated in the brain by a visual input, as in the examples of beauty (including mathematical beauty), desire and love. His discoveries are described in specialized scientific papers and in four books. He is a Fellow of the Royal Society and a Foreign Member of the American Philosophical Society.

### **The enigmatic relationship between micro- and macro-perception**

Colour, form and visual motion are visual attributes that are processed in parallel, but separately, in distinct areas of the visual brain. In the world of macro-perception, 300 ms after the appearance of a visual stimulus, these different attributes of an object are perceived to be in precise spatial and temporal registration, making it easy to assign them to the same object.

But in the world of micro-perception, at less than 300 ms after the appearance of a visual stimulus, these separately processed attributes are not perceived at the same time, because they are processed asynchronously. Within such an early time frame, we instead become aware of the colour of an object some 40 ms before becoming aware of its form and 80 ms before its direction of motion. Hence within such an early time frame, colour, form and directional motion are not correctly bound and we do not perceive them in precise spatial and temporal registration, as in the world of macro-perception.

Much as in physics, where the relationship between what regulates particles in the world of micro (particle) physics and quantum mechanics cannot be derived from the laws governing the relationship of bodies in the world of macro-physics, so the relationship between the laws that govern brain operations in the micro-perceptual world cannot be (and were not) derived or predicted from the laws that govern brain operations in the macro-perceptual world. This raises important issues, including issues about visual consciousness, which (I hope) will take a shorter time to resolve than the century-long intensive work which has left the relationship between gravitational physics and quantum mechanics unresolved.