

## BOOK REVIEW

K. R. Popper and J. C. Eccles, *The Self and its Brain*, Springer International, 1977, pp. xvi-597.

The mind-brain problem is the topic of the book. The two authors (Popper - Part I; Eccles - Part II) examine the issue separately; Part III contains twelve dialogues between the authors.

In Chapter 1 Popper summarizes three main cosmic evolutionary stages: World 1, the world of physical objects (from hydrogen and helium to the living organisms); World 2, the subjective experience (animal and human consciousness); World 3, the products of human mind (tools, human language, works of art, myths, scientific theories). Evolution is described as emergent or creative, i.e. the properties of some evolutionary stages are unpredictable; the appearance of life on earth and of human consciousness are typical examples of the emergent evolution. The holistic properties of the emergent stages of evolution cannot be reduced to lower levels, each level being receptive to causal influences of higher and lower levels: this is the core of interactionism. The self-conscious mind (World 2) is an emergent product of the brain (World 1); World 3 is an emergent product of the mind. The interaction between the three worlds is discussed in Chapter 2.

Philosophical positions differing from interactionism are examined in Chapter 3. Panpsychism (all matter has an inside aspect with a soul-like or consciousness-like quality) is claimed not to be in line with the present attitudes held in regard to evolution: e.g., that memory-like states are an emergent property which does not occur in atoms and in elementary particles.

Epiphenomenalism (only physical processes are causally relevant in respect to later physical processes, while mental processes are causally completely irrelevant, though existing) clashes with Darwinism because consciousness is supposed to exist, but, having no causal effects, lacks survival value.

In the identity theory the mental processes are real and have causal effects upon the physical world, according to the laws of physics; they are "identical" with some physical processes that occur in the brain. However, the two processes are not logically identical: we have knowledge of the mental processes by "acquaintance" (an internal or subjective experience of the brain) and of the physical processes by "description" (an external observation of the brain). So, the main difference between the two processes lies in the kinds of knowledge we can have of them. But if the distinctive feature of mental processes is that they are known by acquaintance, we are prevented from explaining any causal (physical) action of the mind upon the physical world. Moreover, this feature of mental processes does not account for their survival value.

According to psycho-physical parallelism, each mental event corresponds to a definite brain event, in a one-to-one correspondence, and consciousness is a sequence of elementary ideas or of atomic perceptions. Popper's argument against parallelism states that one of the functions of consciousness is to allow us to recognize physical objects when we meet them again; but for recognition we need memory of a previous experience, so our consciousness cannot be simple sequences of experiences.

The materialistic theory of Armstrong (consciousness is the scanning of the brain activity by other parts of the brain) is criticized by Popper because the function of consciousness and of World 3 is not discussed.

Chapter 4 contains some scattered remarks about the self-conscious mind. It is stressed that we actively learn to be selves. From this point of view there is a criticism of the reflex theory of learning, which is regarded as a passive mechanism. The evolution of consciousness is discussed and a vague boundary-line is traced between animal and human consciousness, regarding World 3 as a specific human production.

In Chapter 5 the philosophical and scientific history of the mind-body problem is summarized.

In Popper's section the interactionists' idea is expounded in detail. This point of view accounts for the survival value of consciousness and of World 3 (cultural evolution), in this way agreeing with Darwinism. However it comes up against the difficulty, well known from the time of Descartes, which is common to every dualistic position: how can the physical World 1 and the immaterial World 2 (not-physical) interact?

The impasse of dualism becomes more evident if we consider the issue from a neurological standpoint. According to Eccles (Part II, Chapter 1) the cerebral cortex is organized in columns or modules vertical to the surface, connected to each other by means of the axons of the pyramidal cells. The self-conscious mind is supposed to act upon some modules of the "liaison cortex" producing "a very gentle deviation up or down" of their activity (Chapter 7). More precisely, the mind is conjectured to be active upon the superficial laminae (I and II) of the modules, thus controlling the efferent discharges of the pyramidal cells. The self-conscious mind is conjectured not to be a part of the physical or biological world but as "likely to have different fundamental properties" and "it needs not itself have the property of spatial extension" (Chapter 7). Now, the difficulty of dualistic interactionism is clear.

The primary role of World 2 is explicitly cited by Eccles: the self-conscious mind scans and controls the brain, being connected almost exclusively with the dominant hemisphere. This position has two main implications: the identification of consciousness with human language and the denial of animal consciousness. The former statement, in view of the studies on commissurotomy patients, focal brain-damaged patients and left hemispherectomized

adult patients, is somewhat hazardous. The latter seems not to be in line with evidence from behavioral studies in animals, as pointed out by Popper himself.

In fact, Eccles' argument has already been criticized as being "little more than a desperate rearguard action to safeguard the existence and the indivisibility of the soul" (Zangwill, 1976). This radical criticism seems well-founded, especially considering that Eccles seems to conjecture about the immortality of the self-conscious mind, which cannot be discussed from a scientific standpoint.

Reading this book one realizes how far we are from a solution of the issue. It seems that, at the present state of knowledge, one derives one's own idea also from what Popper calls (Dialogue II) the metaphysical hypotheses (conjectures which cannot, at least at the present time, be either falsified or proven).

*Giuseppe Vallar*

#### REFERENCES

- ZANGWILL, O. L. (1976) *Thought and the brain*, Br. J. Psychol., 67, 301-314.