Brief Overview of the Behaviour Paradigm

Commentary

The behaviour of a living being is the part of its activity that manifests itself to an observer. The behaviour of animals, human and non-human, can be described as the set of actions and reactions (movements, physiological modifications, verbal expression, etc.) of an individual in a given situation. Animal behaviour is controlled by their endocrine and nervous systems. The complexity of an animal’s behaviour is closely related to the complexity of its nervous system. The more complex the brain, the more elaborate the behaviours can become and thus be better adapted to the environment. Although living beings without brains are perfectly adapted like bacteria. The origin, function and development of behaviours depend on interactions with the environment and on the phylogenetic heritage of the species. The main fundamental behaviours are eating, sexual, maternal, social, aggression, defence or escape and inhibition of action when fighting or fleeing is impossible. Ethology is the science that studies and describes human and animal behaviour, but “behavioural psychology” puts it at the centre of its studies, in particular through physiology and neurobiology, which study the biological phenomena that cause these behaviours. Behaviours can be described as innate or acquired, conscious or unconscious, and voluntary or involuntary, automatic or controlled, etc. The study of economic behaviour is the subject of a specific field of research called behavioural economics [1-3].

The term “behaviour” refers to the actions of a living being. It was introduced into French psychology in 1908 by Henri Piéron as the French equivalent of English American behavior. It is used in particular in ethology (human and animal) or scientific psychology. It can also be taken as the equivalent of driving in the psychoanalytical approach. [4-7]. The first step in developing a definition is to identify and characterize what makes it necessary to create that definition. A major characteristic of some living organisms is the ability to move, which allows them to interact actively with the environment. An important aspect of this ability is that movement is not an incidental effect (such as the movement of a branch in the wind), but the result of a specific organization of the body. The primordial factors of life that are directly related to this capacity for movement are: organization, movement, limit and organism. Organization is an essential and fundamental factor of life: every living being is a highly organized structure. Disorganization causes death. Movement is another essential factor of life: almost all the elements of a living structure are in perpetual motion. Stopping the movement causes death. Limit is also a key factor in living things: all living beings have external limits and often many internal limits. The removal of boundaries causes death. The organism is a living structure only through the existence of limits and organized movements [8,9]. Unless it is only a random brain activity, without organization or particular objects? For the time being, neuroscience makes it easier to formulate these hypotheses than to verify them. The synthesis of all the elements presented above makes it possible to develop a definition of the concept of “behaviour”, based on the primordial structural and functional biological characteristics, and which is valid for all living organisms.

It is observed that organized movement within the body (enzymatic reactions, intracellular transport of molecules, protein pumps, endocytosis, cellular migrations, blood circulation, etc.) is an absolute vital necessity for all living beings. On the other hand, the movement organized for the outside of the body (locomotion, gripping, etc.), which corresponds to the notion of “behaviour”, is optional. It exists mainly only in the protist and animal kingdoms. Based on this synthesis, the definition of the concept of “behaviour”, valid for all living organisms, is all movements organized to act outside the organism [8,10,11]. This concept often has clinical and visible manifestations, like sleep disorders. Like Etindele Sosso et al demonstrated recently, if slow sleep seems to be well involved in the process of memorization, paradoxical sleep would not be left out: it constitutes the major part of the sleep time of newborns and young children [12-14]. And disrupting or
suppressing it causes brain architecture disorders in the rat. More and more data allow us today to attribute to it a growing role in certain processes of memorization, and in particular those of the declarative or conscious memory [5,7,9], via an increased presence of senile plaques. The link between sleep and the behaviour seems very philosophical but, this definition, which is more technical and precise than the general and usual definition given in the introduction, makes it possible to identify all behaviours unambiguously: external and objective observation of the movement of an organism (or part of an organism) is a behaviour if there are biological structures specifically organised to produce this movement; for example, the movement of mammalian eyes is not the indirect result of head movements, but results from neural control (ocularmotor rings III, IV and VI, etc.) of the ocular muscles: so there is an ocular behaviour [15-18]. An egg and chicken problem in short, which is not unique: epidemiological data also suggest a link between sleep and behaviour or environment, but which comes first [19]? Mammalian behaviours can be very complex. They are carried out thanks to specialized, highly organized structures and organs: articulated skeleton, muscles, and especially a specialized nervous system (spinal motor neurons, pyramidal and extrapyramidalal motor system) [20]. It appears that the individual in a group or in a society, formal or informal, loses more or less a large part of his autonomy of thought. He then tends to align himself with the thought and behaviour of the group or mass, and thus behave differently from what he would do if he were isolated. Individuals who receive stimuli can change their behaviour [21,22].

References