Book Reviews

Consciousness and Behavior

The Mind of Robots. Sense data, memory images, and behavior in conscious automata. James T. Culbertson. University of Illinois Press, Urbana, 1963. xiv + 466 pp. Illus. $10.

Only on page 364 of this book are we given the first clue about a very critical assumption upon which the author bases much of his case. Prior to that we are promised an explanation of how consciousness can control behavior and, in effect and to some extent, replace a limited number of neurons. But the mystery has only deepened.

There are, in fact, two critical assumptions, the second rather prosaic. The first is the principle of "historical causality." The author remarks, and no doubt correctly, that previously this principle has not been seriously considered in science. Historical causality is to be contrasted, on the other hand, with instant causality, the classical form of causality assumed in 19th-century physics and there considered to be universally operative. On the other hand, historical causality is contrasted with quantum probabilism. The notion of historical causality seems to mean this: in the equations of motion of a dynamical system the derivatives of the six Newtonian coordinates for each element may depend not only upon the instantaneous values of these coordinates but, for a complete specification, may require knowledge of their values in the past. It is suggested that if two apparently identical microscopic particles behave differently, under identical circumstances, the difference may be due to a difference in the past histories. Or to illustrate at a partially macroscopic level, the fact that one has studied German may not show up, even in principle, in the biochemical, structural, or other aspects of the organism, although it makes itself evident in terms of the behavior that is affected by this aspect of the organism's history.

The second critical assumption is stated even later, on page 391. It is the "law of use." It is stated in terms of probabilities, but it amounts roughly to saying that use of a neural pathway lowers its threshold. This, of course, is by no means novel or revolutionary. And, however repugnant the doctrine of historical causality may appear to current philosophical prejudices (and I find it greatly so), it may be well to recall the reluctance with which the notion of "action at a distance" was entertained in an earlier age. Ultimately, a vehicle for this action was developed, but only after people had almost forgotten that they wanted it. However, at the moment, a vehicle for action across a time lapse seems hard to imagine.

In the first portions of the book the author attempts to explain consciousness in terms of a structural theory of neural events. This is, of course, a four-dimensional structure. Also (again of course!), it is the four-dimensional structure of a "conscious" robot, since the structure of living organisms is largely unknown. Specifically, certain aspects of the structure are identified with sensory qualities, since sensation is considered to be the basic stuff of consciousness. But, however convincing this report may (or may not) be, a gap remains and it is by no means closed by "historical causality" and the "law of use." Epiphenomenalism is disposed of quite cogently and succinctly. If consciousness is a mere epiphenomenon and has no influence on behavior, then how could its existence or effectiveness even be discussed? And yet, despite all the author's efforts, consciousness remains a mere epiphenomenon, or, at best, it acquires an adjectival existence, a quality possessed by structures of a certain type and degree of complexity. One gets the impression from promises made earlier, that somewhere consciousness will emerge and, at least in part, take over. But this never happens. If anything, the doctrines of historical causality and use usurp any prerogatives that might have been reserved for consciousness as such. We are then left with a mechanism for which the question "Is it conscious?" may have poetic or religious relevance, but it has no scientific significance whatever.

One might suppose that consciousness is to be that vehicle which carries the causal influence across time, but this cannot be the case. The author is not trying to persuade us that all memories are conscious memories, which remain always at the conscious level. Quite the contrary, he writes at some length about mechanisms for bringing memories to consciousness.

He appears to be attempting to reconcile a thoroughgoing materialism (he is giving a "physical theory of sensory experience, perception, and more generally 'consciousness,' " all of which are "built up out of neuron impulses") with a strict Cartesian dualism. Here the main departure from Descartes seems to be that consciousness acts, not at the pineal gland, but at multitudinous points within the neurons. And whereas we are told at one point that consciousness is "built up" out of physical entities, we are told at another that when consciousness makes its appearance it can somehow do the work of an unspecified number of additional neurons which need not be there. But to the extent that consciousness is doing the work of physical entities that are not there, its processes are not explained by the entities that are there. At that point the physical theory is discarded and the theory is of the dynamics of the supraphysical entity "consciousness" and of its interactions with the physical world.

Along with the philosophical issues, Culbertson develops a theory of the physical basis of sensory experience and attempts to describe, at least in principle, how the theory can be tested scientifically. This is much too elaborate to permit a brief summary. But even here one feels that it would be much more profitable to attempt to design robots to match human beings in behavior rather than in subjective experience. Indeed, it seems clear that the purpose of the book is philosophical rather than scientific. Hence, the book should be judged in terms of its success in providing a physicalistic theory of consciousness.

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