Capra Course

Summary of Lecture 5:
Mind and Consciousness

(with references to the corresponding sections in the textbook *The Systems View of Life* by Capra and Luisi)

In this lecture I discuss one of the most important and most radical philosophical implications of the new systemic understanding of life: a new conception of the nature of mind and consciousness, which finally overcomes the Cartesian division between mind and matter. Ever since Descartes called the mind a "thinking thing," scientists and philosophers thought about mind as some kind of intangible entity, and they could not imagine how this mysterious "thinking thing" was interacting with the body.

The decisive advance of the systems view of life has been to realize that mind and consciousness are not things but processes. This novel concept of mind was conceived by Gregory Bateson, and was developed into the so-called Santiago theory of cognition by Humberto Maturana and Francisco Varela. (*Section 12.1*)

The central insight of the Santiago theory is the identification of cognition, the process of knowing, with the process of life. Cognition is the activity involved in the self-generation and self-perpetuation of living networks. In this way, life and cognition become inseparably connected. Mind is immanent in life at all levels. For example, the relationship between mind and brain, which has confused scientists and philosophers for centuries, is now very clear: it is a relationship between process and structure.

This is a radical extension of the concept of cognition and, implicitly, the concept of mind. In the systems view, cognition involves the entire process of life — including perception, emotion, and behavior — and does not even necessarily require a brain and a nervous system. (*Section 12.2*)

In the Santiago theory, cognition is closely associated with the concept of structural coupling, which I discussed in Lecture 2. Living systems respond to disturbances from the environment with structural changes in their own autonomous ways, and they also decide which disturbances from the environment will trigger those changes. This is the key to the Santiago theory of cognition. Each structural change is an act of cognition; and by specifying which disturbances from the environment bring

about changes, the system specifies the extent of its cognitive domain; it "brings forth a world," as Maturana and Varela put it. (*Section 12.2*)

Hence, cognition is not a representation of an independently existing world. It is a continuous process of bringing forth a world through the process of living. The interactions of a living system with its environment are cognitive interactions, and the process of living itself is a process of cognition. As Maturana and Varela write, "to live is to know."

In the Santiago theory, cognition is associated with all levels of life, whether or not organisms have brains. Consciousness — that is, conscious, lived experience — is a particular type of cognitive process that emerges at a certain level of complexity that requires a brain and a higher nervous system. The central characteristic of consciousness is the experience of self-awareness. (*Section 12.3*)

In the lecture I review recent results in consciousness studies, which is a new and very lively scientific discipline. These include the distinction between two types of consciousness — two types of cognitive activity that emerge at different levels of neural complexity. The first type, known as "primary consciousness," provides the organism with a transient sense of self. We share this experience with all mammals, and maybe with some higher vertebrates. The second type of consciousness, known as "reflective consciousness," involves more elaborate self-awareness — a *concept* of self, held by a thinking and reflecting subject. As mentioned in Lecture 4, it emerged with the evolution of the great apes, or "hominids," around 4 million years ago, together with language, conceptual thought, tool-making capabilities, and organized social relations. (*Section 12.3.3*)

In the lecture, I discuss several theories and models of consciousness in some detail. These include the school of neurophenomenology, founded by Francisco Varela, and the theories of consciousness by Humberto Maturana, Gerald Edelman, and Antonio Damasio. I conclude with the observation that, in my view, the main achievement of modern cognitive science has been the gradual healing of the Cartesian split between mind and matter. (*Section 12.3.8*)

Mind and matter no longer appear to belong to two separate categories, but can be seen as representing two complementary aspects of the phenomenon of life. At all levels of life, mind and matter, process and structure, are inseparably connected. For the first time, we have a scientific theory that unifies mind, matter, and life.