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# Humberto Maturana: Interview (1997)

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Chile, when he first began to depart from biological evidence by trying to conceive of living systems in terms of the processes that constitute them, rather than in terms of the properties that characterize them. In the early 1970s, Maturana's work can be seen as an alternative into the biological and social domains of Ilya Prigogine's theory of dissipative structures, in the sense that Maturana's theory of living systems is a theory of self-organizing but self-regulatory. Indeed, Maturana's concept of autopoiesis is often discussed in connection with Prigogine's work. At the same time, Maturana's theory of autopoiesis has been compared with Gregory Bateson's ecological and social behaviour which Prigogine can only allude to in the physical world. Bateson's work, like Maturana's, is concerned with the ecology of living systems, because of his focus on dysmorphostasis and therefore, matter and energy. Bateson's concern with the ecology of mind, however, is not always on the normal circuit of the nervous system in terms of its dynamics, and how this operational closure constrains the structural changes that can occur in the nervous system, and how these changes are related to perception and cognition.

Maturana is perhaps best known for having coined the term autopoiesis, which is a neologism that means self-production. Maturana's work in the neurocal Cognition's basic neurophysiologic about cybernetics' strange Autopoietic refers to the self-production of living organisms that are structurally coupled to their environment, and therefore, autopoietic systems are open but, for the structural, withdrawn. Francisco Varela, Maturana's former student, and now a colleague at the University of Chile, has argued that Darwinian would have it Maturana argues that, on the contrary, any structural change in the organism is a result of the organism's structural coupling with the environment, because any changes occurring within the organism are specified by the previous state of that organism, and not by the structure of the environment. Thus, the environment is merely the source of triggering or lateral stimulus. Thus, the environment is merely the source of triggering perturbations, and can trigger structural changes in the organism, but it is the organism's own structure that determines what kind of structural changes. It is only the scientific observer, who has some knowledge of the possible changes that the organism could undergo in different environmental contexts, who can say that the environment specifies the changes.

But this is simply one aspect of Maturana's fascinating contribution to the study of living systems. Maturana's work has been influential in the Dynamics The Organization of the Living (1973), and subsequently utilized in his more recent work, Autopoiesis and Cognition (1980). Maturana's work has generated many academic papers. Maturana is currently retired as a Professor in the Faculty of Science at the University of Chile in Santiago, having returned to his homeland in 1960 after seven years in exile. Like many other Chilean academics

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and intellectuals, Maturana felt the country following the overthrow in 1973 of the Socialist government of Salvador Allende, supported by the US and the American backed Chilean General Augusto Pinochet. Nevertheless, Maturana's years of exile seem to have contributed to a growing international audience for his work, which has spanned fields of biology, psychology, social theory, philosophy, education, and the arts.

I first encountered Maturana's challenging ideas over ten years ago through Varela's Principles of Biological Autonomy (1979), and Autopoiesis: The Organizing Construct (1981). Shortly afterwards, I began reading Maturana's own work, and was pleased and surprised at the clarity of his expression and the breadth of his knowledge, which ranged from biology to philosophy. When I discovered that Maturana was a regular visitor to Australia, I immediately contacted coordinator of his Seminar Andreas Weiner proposed to invite Maturana to participate in the seminar. The following interview is a transcript of that interview.

**Could you begin, Professor Maturana, by explaining the meaning of the term autopoiesis, and the context within which you initially employed the term?**

Certainly. The word has two Greek roots: *bios*, which means 'self', and *poiesis*, which means 'to make'. I was trying to explain what living systems are that I had coined the term, but it seems forlorn! and this word was a good one.

**Do you know the meaning of the word?**

No, I don't. In fact, I didn't know that the word had been used before I invented it in order to refer to the organization of living systems, systems that are autopoietic in the space in which they exist and operate.

**Obviously, autopoiesis is closely bound up with the general dynamics of self-organization in the universe. Ilya Prigogine's concept of dissipative structures, for example, has been used by Gregory Bateson to refer to living systems with cellular structures. It seems to me that Bateson's concern with the ecology of mind, and the dynamics of the nervous system, which you claim operate within the closed circuit of the nervous system, is a kind of ecology of mind closure of the nervous system, which should be more fundamental to our understanding of how perception and cognition work. Do you agree with this, and how do you relate it to your work?**

Well, the evidence could be misleading, for example. If you say that the nervous system is in make-up, in terms of nerve cells, connecting with each other, and that the nervous system is closed, and that it is structurally connected with our medium. At the same time, it is not something that can

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can show, for everything that can be in abstract and constructs from in operations.

Now, we, as our system with which you interact, you can always consider the surface of interaction as an ecology. But this observer who's happening within the system. In the case of the nervous system, I can stand one levels of the nervous system, and I can say that the nervous system is interacting with the medium, that you by not see but the nervous system operates, that is, the nervous system is closed in its operation, and it is structurally coupled.

For example, if you consider the synaptic dimension involved in seeing a color, the synaptic dimension is closed. It is closed in the sense that it is that they can respond to a single pulse. Because you can create an asymmetrical situation in which a person claims to be able to see when a single photon arrives. The synaptic dimension is closed in the sense that it is structurally coupled to the medium, and it is structurally coupled to the medium. So the synaptic activity of the brain of millions of cells. So the synaptic activity of the brain is structurally coupled to the medium, and it is structurally coupled to the energy of the single photon. Normally, the experience of seeing is based on the connectivity of the network. So the photon only triggers something that is connected to millions of cells. So the photon only triggers something that is connected to millions of cells. So the photon only triggers something that is connected to millions of cells

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