

System explained by Humberto Maturana

Humberto Maturana's understanding and use of the term 'System'

Speaker 1, Humberto Maturana:

SPEAKER 1: Humberto, I'd like to welcome you here to England and to this conversation.

HUMBERTO MATURANA: Thank you.

SPEAKER 1: In your work, Humberto, you refer a lot to the term systems, and whilst I recognize that you are not a systems scientist, that you are principally a biologist and a neurobiologist, nonetheless, you often refer to living systems or to poetic systems, biological systems, structure determine systems. Would you care to describe in what sense you use this word system in your work?

HUMBERTO MATURANA: Yes. I use the word system to refer to any collection of elements that, through preferential interactions between them, generate a boundary with respect to other elements with which they can also interact in such a way that a totality results from this boundary that arises through the preferential interaction between the elements that constitute the system.

SPEAKER 1: How do you use these distinctions in your daily life?

HUMBERTO MATURANA: The notion of system is necessary certainly to deal with living systems, living beings, because biological phenomena take place with the realization of individual living beings. But in relation to living beings, you have to handle something else, which is change in a very dramatic manner that you can observe in movement for example in growth and things of this sort. And you have to handle change and at the same time stability. Somehow you say it's the same system that has grown. My child has grown so much or something of the sort.

So, you have to have a way of dealing with what is conserved and what changes. And that requires a view of this collections of molecules, in the case of living systems, which

constitutes the unity which is the living system. And it is through that that I have been involved with the reflection on systems in general and not living systems in particular.

SPEAKER 1: Does your understanding of systems and the way in which you bring systems to your work have a history? Would you care to talk a bit about the history of that?

HUMBERTO MATURANA: Yes, well it has-- the history is the following, the teaching about the origin of living systems and the medical school in 1960, I was confronted with a question by student who asked-- the question is not exactly but essentially in the following terms, sir, you say the living systems began 3 and 1/2 thousand million years ago. What began 3 and 1/2 thousand million years ago so that you can say now that living system began then?

And I could not answer this question immediately. But I took this question as an invitation to reflect not only about the origin of living system but about how could one say that something begins. In what moment a system begins? How do you know that it is there and was not there before? How can you speak about change?

Well, this led me in this reflection on the one hand to say something about living systems in particular and at the same time to say something about systems in general. And to eventually to make the distinction, which I make, between organization and structure. These words, of course, have a longer history than my use of them but I have come to use the word organization to refer to what remains invariant such that one can say my child has grown so much. So, it's the same person that has grown. The sameness of the person has to be referred by something that is conserved and constitutes the identity of this person.

And structure, I use it to refer to the components, to the elements that realize the system such that this organization can be conserved through them. So, in general terms, I would say that the organization is the configuration of relations that define the class identity of a system. And it is as long as the system conserves its class identity is invariant, or better as long as it is invariant, the system conserves its class identity.

If that configuration of relation is not conserved anymore, the system disintegrates, something else appears. And the structure has the elements and the relations which could you realize the system as a particular system. So, the structure has more dimensions than the organization, and can change in the history of a system while the organization cannot change.