

Humberto Maturana on Time: Zero-Time Cybernetics

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The American Society for Cybernetics (ASC) awarded Humberto Maturana the Norbert Wiener Medal in 2008. Since he could not attend in person, Maturana sent a letter to the ASC in which he proposed a zero-time cybernetics. After offering some personal reflections on our interactions with Humberto, the authors of this paper engage in an exchange of ideas on time, zero-time and zero-time cybernetics. Our hope is that Humberto Maturana's letter and our thoughts might inspire more discussion and conversation on these topics within the cybernetics community.

Key Words: Humberto Maturana, zero time, structural dynamics, languaging, conversation, zero-time cybernetics, presence-oriented consciousness, biological/cultural matrix, biology of love

Introduction

Both authors of this paper (Jude Lombardi and Larry Richards) have a positive history with Humberto Maturana. While we each had a different relationship with him, we came to admire him as a thinking, caring person who made huge contributions to biology and cybernetics. We wish to honor him and his contributions with some personal reflections and an exchange of thoughts and questions on one of his papers, in particular, a letter that he sent to the American Society for Cybernetics in 2008 upon receipt of the ASC Norbert Wiener Medal, awarded for lifetime contributions to the field of cybernetics. In his letter, Humberto offered some thoughts on the concept of time, specifically invoking the idea of zero-time (or no-time). We think this topic has obvious and profound implications for philosophy. However, he offers it in the context of science, especially biology and what he has called the biological-cultural matrix, where we think it represents new and hitherto unexplored territory. We will let the letter speak for itself in that regard. We decided to focus our back-and-forth exchange on implications for cybernetics in general, drawing on his earlier paper "The Nature of Time" (Maturana, 1995), to help in sorting out the many issues and nuances of Humberto's insistence on *zero-time* and his proposal for a *zero-time cybernetics*. We make no claim to understanding all the issues and nuances of Humberto's intent; rather, we devote our attention to identifying some questions and responses in the hope of engaging others in this exploration of new directions in science and life.

Humberto Maturana's (2008) Letter to the American Society for Cybernetics

First of all, I wish to thank you for the distinction that you wish to bestow on me. It is several years that we do not see each other, but your friendship is dear to me. Now as an act of appreciation and

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respect to you I wish to say a few words in relation to what I would have liked to present to you if I had been able to come. And I would like to speak about a notion that I and my colleague Ximena Dávila Yáñez have been developing since we created together the Matriztic Institute in Santiago the year 2000, and that is called “Biologico-Cultural Matrix of Human Existence”. I shall not develop this notion in full in this short note, but I shall speak of it referring to its conceptual-operational roots.

All the work that Ximena and I are now doing entails the understanding of the biology of cognition and the biology of love, and I shall synthesize this understanding with the presentation of three systemic laws:

Systemic law 1: “Everything said is said by an observer to another observer that could be him or herself.” The observer is a human being or some other being operating as a reflective human being in language.

Systemic law 2: “Whenever in a collection of elements some configuration of relations begin to be conserved, a space is opened for everything else to change around the configuration of relations being conserved”. This is the spontaneous manner of arising composite entities.

Systemic law 3: “The result of a process does not ever participate in its genesis”.

Systemic laws are not ontological assumptions, nor are they definitions; they are abstractions that the observer makes of the configurations of operational coherences that he or she distinguishes in the different operational-experiential domains [in] which he or she operates in his or her living. So, they apply everywhere in the cosmos that the observer brings about with his or her living. Indeed, in this respect Systemic Laws are not different from any other law of nature since they arise in the same way and apply in the same cosmos.

At the end of the year 1999, Ximena (who worked then as a family consultant) approached me saying: “Prof., I have made a discovery; I have discovered that all the pain and suffering for which one asks relational help, is of cultural origin in this patriarchal culture in which we live.” And then she added: “Moreover, as the consulting person tells me of her or his pain, she or he unconsciously reveals to me the moment in the cultural relational matrix of her or his living where the pain and suffering that she or he is now living originated; and in the same process she or he unconsciously reveals me also the path out of such pain and suffering in the cultural relational matrix that she or he is living now”. And in the flow of our conversations along the months she showed me that the pain arose in a moment of denial of love in the past but was not of the past because it existed in being continuously conserved in the present. This was a remarkable assertion that I did not take lightly. When Freud introduced a social view in his study of hysteria, he spoke of trauma and of repression; Ximena spoke of the negation of love in the cultural domain, and spoke of conservation of pain in the present.

We human beings exist in the present, in a continuously changing present, the past and the future do not exist as such, and they are manners of being now, in the present. The cosmos that we generate in our living occurs, exists, as a continuously changing present. The past is a way of explaining the present being lived arose in its continuous change by proposing a generative mechanism that would have given rise to it if the operational coherences of the now being lived were conserved. The future is a manner of living now in the proposition of what would happen if the operational coherences of the present being lived now are conserved in the continuously changing present being lived. Autopoiesis, living, occurs as an in a continuously changing present: living occurs in no time, in zero time. But what is time, then? Is it not time one dimension of the physical space? What are we saying when we speak or talk about regulation and control?

These questions lead me to the following reflections and conversations with my colleagues of the Institute:

When we speak of regulation and control, we intend to relate logically processes that occur in non-intersecting domains and which can only be correlated historically through the memory of their repeated but independent observation. In these circumstances, our ancestors using memory as an operational referent, invented time as an imaginary spatial dimension that would allow them to connect semantically otherwise not related events that result in the historical structural change of a system. Let me use a pressure-cooking pot as an example to illustrate what I mean. It is usually said that in a pressure-cooking pot the “rider” that is placed on an opening on top of the lid of the pot, operates as a valve that lets the steam out to regulates the temperature of the water in it. What actually occurs is that the pressure-cooking pot with water in it and under the fire, has a dynamic architecture whose structural changes result in some independent events occurring in several non-intersecting operational domains that an observer is able to correlate, and then put together in what seems to be a logically coherent causal story in the domain of cooking by saying that the rider regulates the temperature in the cooking process. The observer can do this only after inventing an imaginary spatial dimension that would allow him or her to connect through his or her memory as a single event process that he or she has lived (or has imagined to have lived) in different presents that are otherwise unrelated.

I do not say that our ancestors reflected as I am doing now when they invented time. It was not necessary for them to do so, they just languaged it in their living together as a particular coordination of doings in the flow of their recursive coordinations of coordinations of doings as they lived together as languaging beings. Moreover, in doing so they generated time in the same spontaneity as they generated each one and all the things, entities, notions concepts, ... of the worlds that they lived as they live together their languaging human living.

Time as an imaginary spatial dimension transformed the human operational-conceptual world as other imaginary notions like imaginary numbers have also done. I think that the invention and use of time as an imaginary new dimension of space in the three-dimensional present in which our non-languaging existence occurs, permitted us cultural human beings to conceptually and operationally connect not-connected processes and events occurring in independent domains by creating the operational domain of descriptions as a manner of living in the flow of events in their succession in “time”. The semantic notions that the imaginary dimension of time permitted to introduce in the description of the operation of systems became an operational dynamics connecting process that occur in domains that do not intersect because they occur in different presents. The use of semantic notions seemed to facilitate the understanding of the operation of systems by treating processes that occur in non-intersecting domains as if they occurred in our daily life which is where semantic notions operate.

The beauty of using the imaginary dimension of time in the description of what we do, we think, or we see in the flow of our living, is that it permits us to propose connections in the present that we are living with whatever we imagine that we are living or that have lived, regardless of whether they occurred in the same or in non-intersecting operational domains. The use of the imaginary spatial dimension time permits us to reflect on what we do and feel as if we were, without knowing it, in a shadow theater, relating things that we do not see that cannot be related because they occur in different non-intersecting operational domains. To do this, though has had an undesired additional consequence, namely, it has obscured our understanding of the architectural dynamics, which as a flow of structural change in the continuous changing present of existence, gives its historical unity to a system that in the flow of its own existence occurs without past and future as a continuous now. The most usual and difficult trap that comes from such blindness on the structural dynamics of systems is resorting to reductionism in an attempt to escape the realization that past and future are cultural manners of living in the present.

We human beings cannot live as cultural human beings without time, but we live our biological continuous changing present without time, that is in zero time, as all living beings do even when we use the notion of time as a physical dimension, forgetting that it is an imaginary explanatory spatial dimension invented to bound the beginning and the end of systems in their operation as discrete entities. The cosmos that we bring about as cultural human beings exists in time, but all the process that we describe as occurring in by themselves in it occur in zero time. Organisms operate as discrete singular entities, or totalities, in a continuously changing present, and they exist as totalities bounded by borders generated through their own operation, without end or beginning because they occur outside our description in zero time. It is we cultural humans that exist in time who want a temporal closure for organisms and wish to see them with beginning and end. But to do so we have to use time leaving out for a while semantic explanatory notions or semantic connections and look at the organisms as dynamic architectures and see them as a continuously transforming structural dynamics in the present. If we manage to do so in our imagination, we shall indeed see organisms as self-bounding four dimensions autopoietic totalities with the form of a sausage that is beginning at its conception, and that is ending at its death.

This can be illustrated with a drawing of a vertical sausage of processes to be looked through a slit that moves from its beginning to its end (or birth and death in an organism). [See illustration and instructions below – Ed.] If we do this, we will see at every moment as we look through the sliding slit a changing present disconnected from all other moments of changing present that we have already seen or that we think that we will see later. If all that we see in our living is a slice of our continuously changing presents, the imaginary spatial dimension of time offers us two basic possibilities to interconnect the separated presents of our living. One is to interconnect them with a thread of semantic notions such as control, information, purpose, or regulation, that are semantic notions that we easily use in our daily life in occasions where memory helps us not to confuse the description of a process with the process itself. The other basic possibility is to orient ourselves to see the changing dynamic architecture that the organism, with everything else in the cosmos or worlds that we bring about in our cultural living is. I consider that this second possibility is the one that will lead us to the understanding of our existence as cultural human beings because it will lead us to see how not-intersecting relational-operational domains arise continuously with what we do, as the recursive dynamics of the spontaneous generation of intrinsic novelty in the cosmos and worlds that we bring forth with our cultural living. Indeed, non-intersecting domains arise as we do distinctions, reflections, recursive operations, and we mostly do not see this because we usually treat what we do as if they were happening as part of the totality of our doing. As this happens to us, we usually correlate the independent processes in the not-intersecting domains without being fully aware that they do not intersect, and we propose logical relations between them which do not apply under the form of ad-hoc semantic relations. When we attend at the dynamic architecture of what we are doing we do not confuse domains and do not treat correlations as if they were logical relations resulting from their occurring in the same operational-relational domain. And finally, if we attend to the dynamic architecture of systems, we will also realize that as they exist in a different domain than the domain of existence of their components, they affect each other through the operation of their components if these exist in the same domain. Much of the confusions and misunderstandings in relation to the use of notions such as language, consciousness, or mind arise from the use of semantic notions that obscure the vision of the changing dynamic architecture of the systems and the worlds that we generate in our human cultural existence.

We cultural human beings use in our daily living many imaginary explanatory notions, but whatever these may be, they operate through the realization of our living as autopoietic organisms in a space with four dimensions, one of which is imaginary time. But it does not matter that time should be an imaginary dimension, autopoiesis, living, occurs as a changing dynamic architecture, and as a result of that, all that we human beings do, regardless of whether we do what do as biological or cultural beings, occurs in one single domain, in the flow of our realization as autopoietic beings. We, cultural human beings, as all living beings, live as valid all that we live, and this is how we live in the same

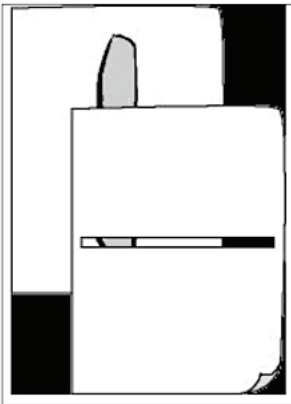
manner both imaginary and not imaginary spatial dimensions. That is, as autopoiesis occurs in a domain of three spatial dimensions plus one imaginary that is time, and all that occurs in and with living systems, and particularly all that occurs in and with us occur in the realization of our living, all other imaginary relations that we create in our cultural living become valid for our living in zero time that we are living, whatever their historical consequences in other zero time in the flow of the cosmos that we bring forth with our living.

My colleagues and I in the Institute are using the understanding of the changing dynamic architecture in our living to understand the actual operation of systems without introducing semantic notions to explain what happens in them and with them. And in particular to understand how does the past that we generate as an explanatory notion in an imaginary dimension, operates in the zero time of the present conserving cultural pain and suffering.

In the course of our living we have just published in Spanish a book called “Habitar Humano, en seis ensayos de Biología-Cultural.” The title in English will be: “Human Habitats, in six essays of Cultural-Biology”.

Many thanks,

Humberto Maturana Romesín (May 2008)³



The ‘sausage and slit’ illustration can be demonstrated using two pieces of paper.

On one is a picture of a vertical ‘sausage’- shaped figure representing the organism’s totality in four dimensions (including time). The ‘beginning’ is toward the bottom and the ‘end’ is toward the top.

The second sheet of paper has a narrow horizontal slit through it.

Moving the slit sheet over the figure sheet illustrates (a) the limiting scope of the instantaneous present and (b) how the ascribed ‘future’ and ‘past’ (‘sausage’ portions visible above / below the slit sheet) lie outside this scope.

Sausage and Slit Illustration (Maturana, 2008, p. 5)

Personal Reflections

Larry Richards: I first saw Humberto give a presentation at a Gordon Research Conference in New Hampton, New Hampshire, in 1984. I would see him many times again at conferences of the American Society for Cybernetics (ASC) and other organizations and had a chance to interact with him on some of those occasions. During the time I served as President of the ASC (1986-1988), he presented at five conferences that I attended. I struggled with the ideas he was presenting, at one time telling my ASC colleague, Rodney Donaldson, that I did not see the significance of these ideas to anything in which I was interested. Rodney, to his credit and with my

3. <https://asc-cybernetics.org/2008/HM-08WienerComments.pdf>

gratitude, would not give up on me. We had many conversations, and I came to have a great appreciation of Humberto's contributions, not just to biology, but to the human enterprise in general and our lives in it.

One encounter stands out for me. At the ASC conference in Victoria, British Columbia, in 1988, Humberto made three comments that stuck with me and still today gnaw away at my brain.

- A couple of us happened on Humberto and Gordon Pask having dinner and asked if we could join them. At some point, the topic of language came up. I suggested that the phenomenon that Humberto called languaging was similar to the phenomenon that Gordon called conversation, to which they both immediately responded "No." This was an important moment for me, as it helped clarify both concepts. Languaging is about coordination, specifically, the consensual coordination of the consensual coordination of action. Conversation is not about coordination, even though it happens in language and some coordination might be useful or necessary. Conversation arises from frictions (that is, asynchronicities) among the participants and proceeds as an intimate interaction as they work to resolve their differences. Conversation is the converse of control.
- During his conference presentation, Humberto was asked what he would recommend to mitigate the cruelty and violence so prevalent in human societies today. His response was something to the effect that we should let biology work. His argument was based in part on what he calls the fundamental emotion of mammals in general and humans in particular, namely love. The cruelty and violence we witness in the world is a consequence of the denial of love that characterizes much of the day-to-day systems in which we work and play. Does this imply, I thought to myself, that we shouldn't do anything about poverty, oppression, environmental degradation, and so forth, but rather just let it work itself out? Not necessarily, but perhaps the setting of goals and seeking of solutions contribute to the very phenomena we are trying to avoid.
- In private, I asked Humberto about how he addresses in his formulations the concepts of time and history. Certainly, biology and science in general depend on these concepts, yet they are abstractions that we take for granted in our everyday lives. I do not remember his exact response, but I seem to recall that he indicated that time was a human invention and that history was a necessary concept for explaining the world. However, all we know and all we do is right now, in an everchanging present. The past explains what is now; the future explains what is not now. It was this interaction that led me to the idea of the cybernetician as a craftsperson in and with time (Richards, 2020).

Jude Lombardi: Conversation as the converse of control entails letting go and letting biology work.

Your statement “Conversation is the converse of control,” reminds me of Humberto’s comment in his 2008 letter regarding a relationship between time, control and regulation. All of which, he claims, are external notions that require the invention of an imaginary spatial dimension. He further suggests that our ancestors did not likely do this intentionally, but that in the flow of their living together as languaging beings, in their particular flow of their recursive coordinations of coordinations, such notions emerged out of necessity. Our human need for order is met by the necessity for time?

I too realize time is a necessary human invention and that models of consciousness that are purpose oriented and goal directed are necessary, but also limit our doing in certain domains, particularly the domain of dynamics where biology is a happening. Biology, in this context, is not about the study of life but a study in living. Human living always takes place in the relational space of humanness where culture and biology intersect. We humans exist in zero-time in the continuous flow of our changing conversational presence. So as Humberto said: “Your present changes your past changes. Your present changes your future changes” (Maturana, 1992a, quotation starts at 1:50 min). How hopeful.

Larry: What is your history with Humberto?

Jude: I first met Humberto Maturana along with Herbert Brün (both served on my doctoral committee) at my first American Society for Cybernetics meeting in 1992. The conference took place on a small, isolated island in Seabeck, Washington state. It was organized by then ASC president Rodney Donaldson and entitled “Language, Emotion, the Social, and the Ethical, An In-depth Exploration of the Cybernetics of Herbert Brün and Humberto Maturana.” I had no idea what I was getting into and would soon find out.

I knew intuitively, they were saying things radical and unique that I needed and wanted to hear and yet I could not comprehend. It was also during the 1992 conference that I emerged as a video ethnographer. I videoed much of the conference which allowed me to view the lectures over and over again, learning more about these radical ideas with each view.

Recursion: Always Back on Self Yet Never Quite the Same.

At the 1992 ASC conference, both Brün and Maturana offered me what I was searching for, healthy models for understanding and explaining human thinking and doing. Back then I was a social worker, working with severely “emotionally disturbed” children. My particular specialty was the de-escalation of behavior. I had first heard the term *cybernetics* while attending a training by Allen King Cooper who was hired by the state of Maryland to educate childcare professionals in how to talk kids down without violence. Cooper’s ideas led me to create *behavioral cybernetics*, which eventually led me to the ASC in 1992.

During the 1992 conference, I clearly remember Humberto drawing his closed circle, representing the autopoietic system, in a relational medium, with an observer.

(Maturana, 1992b)

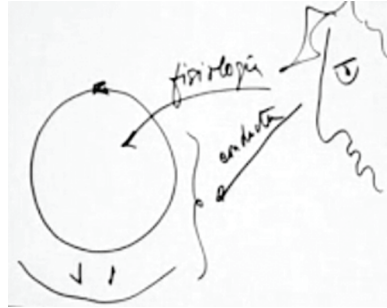


Image from video of Maturana's presentation "Relativity" (Maturana, 2012; <https://www.youtube.com/watch?v=5WgpP0MFHXc>; image appears 18:44 mins)

I thought his explanation was more natural than any of the others I had ever experienced. During his presentation he pointed at a variety of dynamic/relational explanations for living. I will focus here on three fundamentals that orient my thinking 30 years later. They are:

- I. His cybernetic starting point regarding humans as observers observing.
- II. His biological explanation of living beings as fundamentally emotional beings.
- III. His claim that the biology of love is the fundamental emotion of all living beings.

I. His cybernetic starting point. Observers live immersed in language. It is our living immersed in language that generates us as observing beings. This makes humans unique and also allows us to articulate what makes us similar to other living systems. "We human beings happen in language, and we happen in language as the kind of living systems that we are. We have no way of referring to ourselves, or to anything else, outside it. Even to refer to ourselves as non-languaging entities we must be in language. Indeed, the operation of reference exists only in language, and to be outside language is for us as observers, nonsensical. For these reasons it is essential for understanding the observer as a human being, to explain language as a biological phenomenon." (Maturana, 1992b, p. 22)

II. His biological starting point. All living creatures are molecular autopoietic organisms immersed in a medium at every moment of their living. It is in this biological cultural matrix of humanness where an observer observes body dispositions that emotioning emerges.

Emotioning: any and all body dispositions observed in the relational space of humanness.

It is emotioning that constitutes living. No emotioning, no living. Emotioning is a dynamic all living systems share. We humans live in a dynamic emotional/relational space of humanness.

Maturana spoke often about emotions, moods and emotioning:

The Western culture to which we modern scientists belong, depreciates emotions, or, at least considers them a source of arbitrary actions that are unreliable because they do not arise from reason. This attitude blinds us to the participation of our emotions in all that we do as the background of bodyhood that makes possible all our actions and specifies the domains in which they take place. And this blindness, I claim, limits us in our understanding of social phenomena. Let us reflect upon this matter: (i) All animals have different domains of internal operational coherences that constitute dynamic body postures through which their actions and interactions in their respective domains of existence take place. (ii) The observer distinguishes different emotions and moods through the distinction of the different domains of actions in which the observed organisms move. Thus, all animal behavior takes place in a domain of actions supported and specified at any moment by some emotion or mood. Indeed, all animal life takes place under a continuous flow of emotions and moods (emotioning) that changes the domains of actions in which the organisms move and operate, in a manner that is contingent to the course of their interactions. We human beings are not an exception to this. Moreover, in us human beings emotioning is mostly consensual, and follows a course braided with languaging in our history of interactions with other human beings. (iii) The observer distinguishes different emotions and moods through the distinction of the different domains of actions in which the observed organisms move. (Maturana, 1992b, p. 27)

I spoke with Humberto in 1994, when he clarified for me his use of the words love and aggression.

Love: The domain of those behaviors through which the other arises as a legitimate other in coexistence with oneself.

Aggression: The domain of those behaviors through which others are negated as legitimate others in coexistence with oneself.

III. He goes on to claim that when observing the relational space where human living is happening, not only is emotioning a fundamental feature but that love is the fundamental emotion of all living creatures—in the domains in which they exist.

The biology of love: the domain of behaviors in which the other arises as a legitimate other in coexistence with oneself.

At the 1992 conference, Humberto told the story of a spider and a human and their relationship as an example of the biology of love across species (Lombardi & Maturana, 2021).

I consider these three fundamentals extremely important when exploring ways to address our asynchronicities without violence. In this context, it is important to articulate a distinction between Maturana's definition of *conversation* and your definition, Larry, for *conversation*, since I find them both useful in certain situations. By the way, I choose to use the term languaging to describe the braiding of emotioning with language that emerges through the domain of behaviors in the relational space of humanness.

Maturana describes conversation as a human interaction that entails the braiding of languaging and emotioning in recursive coordinations of coordinations of consensual behaviors. He also claims that all human activities take place as networks of conversations and that closed networks of conversation generate culture (Maturana, personal communication, 1996).

I also cling to your interpretation of the term conversation. What I call *deep conversation* which emerges when observing asynchronicity that evolves into synchronicity. As you have said, three categories for the word conversation are useful: a conversation we have with ourselves, a conversation we have with another, and a conversation we have with society. In each case, the *we* is a role or perspective temporarily taken (Gordon Pask's p-individual). In each case, the dynamic is similar—a back-and-forth interaction in a language starting with an asynchronicity moving toward synchronicity. (Richards, 2010). For me, this is when the concepts of zero time or no time become invaluable.

Larry: I tend to use the word “conversation” in the way you might use “deep conversation”. Sometimes, I will speak of the cybernetic version of conversation to distinguish it from common usage: what I would call polite cocktail conversation or chit-chat (which can, of course, also be useful). The cybernetic version of conversation requires a conflict, disagreement, friction, inconsistency, that is, being on a different page or out of synch with the other. However, it also requires a preference on the part of the participants for recurrent interaction, that is, a desire to continue the conversation and pursue some insight into mutual differences.

And yes, I claim that conversation, as a dynamic, happens in zero-time, not in the past or in the future, but right now, everchanging. When a conversation gets recorded as a dialogue (as in a written transcript), it is no longer a conversation. What gets recorded is the content; what does not get recorded is the dynamics. While a writer can give clues about the dynamics, and a reader can imagine a dynamics, the dynamics of the original conversation is unique to that moment. Furthermore, as an avenue to a form of participation that requires no ability to cause things to happen, this perspective is essential. Every moment I am in a conversation I make a difference in the world.

Jude: Yes, every moment in conversation I makes a difference. One possible triadic model for maintaining one's cognitive equilibrium: adaptation, assimilation, accommodation (Glaserfeld, 2003). Maybe deep conversations invite participants to accommodate rather than assimilate.

Assimilating is when what I hear fits with my established epistemological and structural dynamics at that moment. Whereas accommodating requires a deep shift in my current epistemological and structural stance and the necessity for generating a new scheme. So maybe deep conversations provoke deep epistemological shifts in one's knowing and doing?

I tend to think of conversation as a description, an abstraction, of our doing. Whereas zero-time, always in a presence, is indescribable. Our biology is such that we do the only thing we can do, always in a present. And as observing beings we operate while living immersed in languaging, which allows us to construct and explain our experiences. There are at least two phenomenal domains for observing: the domain of experience which is dynamic thus unexplainable, and the domain of explanations, using the language of logics and causal relations.

Being *in* zero-time is unexplainable. I wonder, if there is a possible distinction between zero-time and zero-time cybernetics?

Zero-time, a momentary phenomenon that entails an observer in their present niche. "Performance, sharing your presence" (Herbert Brün in Lombardi, 2021; quotation starts at 36:25).

Zero-time cybernetics, transdisciplinary explanations for embracing zero-time. Hence, instead of offering an epistemological stance for a consciousness that is purpose oriented and goal directed, cybernetics offers one that is also presence oriented and process directed.

Zero-Time Cybernetics

Larry: I think the last time we saw Humberto in person, Jude, was at the 2012 ASC meeting in Asilomar, California. He gave a presentation there called "Fundamental Relativity" (Maturana, 2012).

I think it was one of his colleagues at the Matriztic Institute who also gave a presentation that included a reference to zero-time, which I could not attend. Since I had missed the presentation, I decided to send Humberto an email asking about it. He replied, indicating his continuing interest in this idea of zero-time (or no-time), implying that he was focusing much of his attention on it. He attached a draft paper that was a slightly expanded version of his letter to the ASC in 2008 except he now used the term *zero-time cybernetics*.

As an example of the expansion, he had added a fourth systemic law: "Everything that happens occurs in the instant that it occurs as it occurs, not after or before" (Maturana, n.d.). Hopefully, we can exchange some thoughts and/or questions on this idea.

Jude: Zero-time cybernetics offers a model of consciousness that is present oriented and process directed in the here and now, which is all there is anyway. This reminds me of Annetta Pedretti in two ways. First, at the 1993 ASC meeting in Philadelphia, Pennsylvania, Annetta talked about the possible consequences of a temporal

dimensionality when trying to describe language. “When I am weaving this thread, when I am following the thread, it becomes possible at any moment in that continuity to say the next thing. It’s only a question of how I get there. It’s not a question of what things are. It is a question of how I learn. It is a question of when I can say something As we become confident of that, we stop being these outside observers, we stop being these controllers and we start swimming in something which flows There is a sense in which I can trust that if you cut my thread even that can become the thread that I can pick up again and make it possible to say the thing.” (Pedretti, quoted in Lombardi, 2021)

Secondly, her idea that as a society we are running out of clockwork, so we have more time for artwork. “To make things work is the work of art” (Pedretti, quoted in Seaton, 2021).

Larry: In the brief email exchange I had with Humberto following the 2012 conference, he seemed to imply that this idea of zero-time (or no-time) was what he was devoting himself to and wanted to get others involved. I was not, and still am not, sure what to do with it, except that I have had an obsession with the idea of time as far back as I can remember, which motivates in part my continual interest in cybernetics (Richards, 2016). I speak of the cybernetician as a craftsperson in and with time, implying that time is not external or given and that it can be manipulated. This is not how science treats time. I claim, as does Humberto, that time is a human invention, a concept needed in order to connect phenomenal domains that would otherwise be incompatible or opposing, and so avoid inconsistency, paradox and/or contradiction. I regard Humberto’s distinction between the domain of dynamics (experience) and the domain of explanation (relations) to be a contribution, the significance of which has yet to be realized, in biology, science, policy-making, design and everyday life. So, yes, I would like to see the cybernetics community take up Humberto’s proposal for a zero-time cybernetics.

Jude: Yes! A braiding of the domain of experience (dynamics) where our structural determinism is an autopoietic happening, and the domain of explanations (relations) where our languaging generates a biocultural matrix of doing.

I think zero-time cybernetics is not only important but revolutionary in that it requires letting go of notions such as control, regulation and purpose when interacting with other living (autonomous) systems. Yes, we need an external notion for time. We also need to embrace zero time as a matter of our living as autopoietic biological cultural beings doing the only thing we can do at any instant of our living. Maybe this is also something we share with other living organisms?

What do you think about the importance of the notion zero-time cybernetics?

Larry: Maturana starts with the idea that living happens in the moment, not in the past or future, but rather in an everchanging present. Hence, in no-time. He then seems to suggest that many (even most) of the concepts/explanations/descriptions we language

into being depend on a concept of time (although there are significant differences across cultures). Time has become so embedded in our cultural lives, and our relation with the world, that we cannot live without it. The cybernetic ideas of goal and regulation, for example, depend on time. He suggests that, if we were to set the idea of time aside and focus on the structural dynamics of human experience, we might arrive at new insights into the human condition, while recognizing that we cannot just stop living in the world of time that we have. Perhaps, we go back and forth between the two domains, retreating to the dynamics of our being (and our conversations) when the violence of the world seems too overwhelming to address in the usual, purpose-oriented (and time-oriented) way. This seems to be related to your idea of a consciousness of presence, as opposed to the consciousness of purpose that dominates how humans tend to address problems of the world. However, if I am living in the moment, with no past and no future, there are no objects, no problems, no solutions, only dynamics. Can I even think about an everchanging present without moving to the domain of relations?

Jude: Maybe our traditional use and need for the notion of time is why wicked problems are wicked?

Larry: For me, the question is: How does the way of thinking that guides our behavior shift when we acknowledge the two domains, and especially when we acknowledge our structural dynamics in zero-time? If we take the view of an everchanging present, how can we think of change without a concept of time? Doesn't change happen over time? What if change was taken as fundamental—not object, not entity, not matter or energy or even information, but change? What world would we bring forth if the logic of the world was a logic of change and only change, in the moment? Since all currently best available knowledge is formulated with time as a given phenomenon, we perhaps have no choice but to address the problems we face with that knowledge and in the context of time. Hence the dilemma: needing to address the problems of the world in time (because that's what we know and live) while recognizing that the sources of those problems may be in how we think of ourselves and our world as dependent on a time that is external and given. What does a shift to a consciousness of presence do for us and our world? That's the question for cybernetics.

Jude: I feel like I, we, just came full circle—how cybernetic. I am beginning to see where no-time might fit for me.

I think the implications of living with awareness of the possibilities of zero-time cybernetics are magnificent. This conversation takes me back to my comment about when I was first exposed to cybernetics and my co-construction with childcare workers and teachers of behavioral cybernetics, about how to de-escalate a situation without violence. This requires that one access both their relational and dynamic cybernetic ways of thinking, being and doing in order to be an effective change agent (Lombardi, et al., 1993).

Larry: Yes, without time, there would be no problems. We would just do what we do when confronted with obstacles or threats, like all living systems do. However, we humans also live in a culture, in the context of time, and so must deal with wicked problems as a human undertaking. Jude, do you have further thoughts on the potential significance of the idea of zero-time cybernetics? I am still trying to wrap my mind around the idea and its implications.

Jude: In his 2008 letter Maturana mentions his partner Ximena's discovery that the suffering her clients were experiencing could be traced to moments in their living where the biology of love had been negated in their biocultural matrix. Furthermore, it was through the flow of their conversations that a path toward recovery emerged. I suggest this process of flowing in conversation in zero-time cybernetics while in the biology of love is fundamental. That is, being in moments where time as an invention disappears. *How* is the question.

Concluding Questions

Larry: How can we live in the world of time and language day-to-day while recognizing that this idea of time is an invention? How do we address the issues of the world we live, like climate change, for example, as individuals and communities, such that biology is allowed to work? Do we act differently from how others are acting? How do we stay in the moment knowing that as soon as we step into the world of time and language we face a situation that appears already doomed to global disaster? How do we avoid or change the apocalyptic vision? Do we retreat to the moment? Do we stay optimistic about technological innovation? These are questions for the cybernetics community.

Jude: Sounds like a great set of questions for a cybernetic conference. As Pedretti said:

These conferences each time regurgitate stuff and the next time it will be possible to say different things. The sentences in which these ideas were originally formulated were very contorted. And over time, they became easier to say So, the sense in which the language or the culture of our cybernetic language developed is the way in which our way of drafting things developed, is the way cybernetics developed. There is no distinction. I'll leave it there. (Pedretti in Lombardi, 2021, quotation starts at 48:55 min.)

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