

The Biology of Business: Transformation Through Conservation

Humberto Maturana and Pille Bunnell



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In this series of essays, I reflect on the biological background on which rests the concern for how we conduct our business affairs. In doing so, I show how we may avoid the kind of blindness that makes even the best management systems fail. I do not offer solutions; I offer vision. To evoke reflection and vision, I speak about human history and the history of the earth, about living systems and human organizations. I speak about language, emotions, freedom, ethics, and beauty. You will see that all these factors indeed have to do with business.

In this first essay, I look at how conservation has to do with change. Usually, we see conservation as a polar opposite to progress and change; we do not see that these two dynamics are inextricably linked. We do not see that what we choose to conserve determines what is free to change. Thus, conservation also has to do with preferences: Evolution and change have to do with preferences. This concept does not mean that we can control what will happen, but that is the topic of another essay. However, what we choose to conserve makes possible one kind of future—or another.

History Explains the Present

Everything that we do occurs now. Although we speak about the past and the future and live in the ideas of past and future, we exist in the present. We belong to a history that runs in a continuous changing present. Thus, history is something that happens in the present, so what we call *history* has to do with how we live in the present.

We can claim that everything began with the Big Bang. However, notice that this Big Bang is an invention of a history to explain the present. We use the coherences of the present to invent a Big Bang such that if it had taken place, the present that we live now would be the case.

I propose an image that conveys this notion of inventing a history to explain the present. Consider what happens when a pebble is dropped in a still pool and a wave begins to expand. The expanding wave-front occurs wherever it is: It is a continuous "now." If a couple of points are selected on the wave-front, an origin for it can be invented, but the wave-front itself exists now. Similarly, an origin for the universe can be invented from observations we make now. In the same way, when we propose an origin for the living systems on earth, what we are proposing is the origin of the historical wave-front of living beings that is the biosphere now.

What is interesting is that we do find coherences that are adequate for inventing an origin in a way that remains consistent with other observations we make now. The image of the little pool helps to explain this, too. Consider various bits—leaves, little sticks, seeds—floating here and there on the surface of the water, some of them touching one another. If we look at the movements of these floating bits, we shall find that they have two kinds of coherences, some of which are historical, others that have to do with nearness, and still others that have to do with other influences. When the pebble makes a

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wave, all the little bits that the wave encounters move simultaneously. They are coherent because the movements on the wave-front have to do with the history of the wave-front, in the sense that the wave-front has a coherence that has to do with its history. Other coherences have to do with nearness (e.g., when one leaf touches another). Still other coherences have to do with other wave-fronts that intercross the original wave-front. Imagine, for example, what would happen if the wave-front from the pebble triggered a floating seed to pop so that it started a new wave-front.

What we have in this image of a pool is not only an evocation of our existence in the present but an image of the coherences among ourselves and in the world in which we exist. Some coherences are of a historical nature (i.e., they exist because we belong to the same history). Others exist because we are making this history of a changing present through the interactions we have now with what we encounter (i.e., through nearness).

Transformation Through Conservation

Whenever we want to explain the origin of something, we make a computation according to the coherences of the present. We propose what happened such that this is so. We propose a history. And what is history? History is a process of transformation through conservation: History is a process of transformation based on what is being conserved. Noticing this is interesting because usually we do not pay attention to what is conserved, only to what changes.

We can speak about anything being historical precisely because it is a story of conservation. If conservation stops, history ends. If we want to make a historical connection through a change, we have to show that something has been conserved through the hiatus and did not end when something else ended. We may wish to say that a process, an idea, or a relation was conserved, such that although something ended, something fundamental was conserved. The story has to contain a continuity.

When in a collection of elements some configuration of relations begins to be conserved, a space is opened for everything to change around what is conserved. All systems arise in this way: Something begins in the moment a configuration of relations begins to be conserved and ends in the moment that the configuration of relations that defines it stops being conserved. We know this in our daily life; yet, stating it explicitly is interesting. For example, when we say that a particular company has existed since 1893, we mean that something has been conserved; it could be the name, or it could be a particular configuration of relationships of how people interact with each other, or it might be what the company produces: whatever we claim constitutes the identity of the company. The same is true in the history of living systems: Some life forms disappear, others go on, and new forms arise. What is conserved in this history? Living. How did living begin? Any explanation of the origin of life is based on the coherences of the present that allow us to invent an origin and a progression of happenings from that origin.

We are one of these millions of life forms living on the wave-front that is the present of a history of the conservation of living. We call this wave-front the *biosphere* and, because we are part of it, we find ourselves coherent with it. Indeed, we find it beautiful because we are coherent with it. Further, we are coherent with it because we belong to the same history and to many local coherences.

Conservation and Preferences

If you think about your personal history, you will discover that everything in your life has happened so that you are here, right where you are in this moment, reading this article. Everything—where you were born, who your parents and friends are, where you went to school, what language you speak—everything leads to this moment. You can make a trace from now into the past in a way that shows that ev-

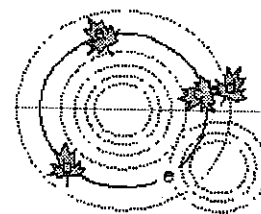


Figure 1 The expanding wave-front made by a pebble dropped into a pool represents the present moment. If we see a picture of such a wave, we can invent an origin. Further, all the floating leaves encountered by the wave move coherently; either because all are connected to the same history—in this case, of a pebble dropping (a, b, and c)—or because they are touching each other (c and d). This image can become rich as one expands it with the notion of intersecting wave-fronts (e).



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ery turn you took, every choice you made, brought you here. So, it seems that you were destined to read this article today.

The beauty of this silly little exercise is that it shows us that if one looks at a history this way, it appears that everything is predetermined or fated; but it is not. Your entire life was not directed at reading this article; you resulted here. That is the nature of biological history, the way any living being lives. What happens is constructed moment by moment by the character of one's living, always going in the path of well-being, a choice of comfort, desire, or preference. An animal may prefer to go one way and, in doing so, it happens to be eaten by a predator. If it had chosen another way, it might not have been eaten. Did it choose based on the consequences? No, it chose according to its desires in the present, because living is in the present. Even when our desires include the future, we live them in the present.

What we choose to conserve has different consequences. No particular way mandates where we are supposed to go with this. In this process of evolution, nothing matters; no direction, purpose, or intention prevails. The cosmos does not care, the earth does not care, the biosphere does not care what we do. The entire history of the biosphere is a history of tremendous alterations and massive waves of extinctions. Much has disappeared, and new things have appeared. In this sense, if we modify the earth so that we create total ecologic disaster and disappear as a species, it does not matter. However, for us it matters; rather, for us it may matter.

A History of Preferences

If we want to invent a human history, we will have to show a path of conservation that would lead to the path we follow now. And what path do we follow? We follow the path of our desires, because desires define what we conserve. This point is not trivial, and fundamentally we all know this. When we are concerned about what we are doing, we are concerned with conserving that which we desire.

Human history does not follow the path of resources or opportunities; rather, it follows the path of desires or, in more general terms, the path of emotions. In the history of living, every moment, every change, whether it resulted in survival or extinction, has arisen along a path of preferences. This is how the course of evolution has taken place. Usually, we speak of evolution as a process of natural selection and, in so doing, confuse the outcome with the process. The outcome of following different paths of preferences is differential survival. When we call this differential survival *selection*, we evoke the notion of a force as the active agent doing the selecting; but this is not what happens. Selection is the result of a differential survival generated through preferences, not the process that generates differential survival.

We move around seeing different things, wanting different things and, according to our desires, we consider these things resources, or opportunities, or something else that has to do with what we want. If we do not want to have them or use them, things are just there, being whatever they are for themselves. Something is a resource if one wants it, if one desires it. Similarly, something is only an opportunity if one desires it. So, it is our desires that define what becomes what: what is conserved and what disappears in our living.

Businesses for Finite Backgrounds

In our businesses, usually we wish to conserve production, efficiency, and success. All these entities rest on a background at which we usually do not look but which sooner or later appears in front of our nose. This is the background in which what we do is possible: the systems in which we are embedded.

Whenever we identify a system of some kind, it is embedded in another system. If we think of ourselves as a system, we see that we are embedded in a community or a family or an organization in which we work. This system then is embedded in another system. That outcome does not mean that each system acts as a passive container for those inside it but that the smaller system is embedded in a flow of interactions and modulations between itself and the larger systems. The larger system determines what can and what cannot happen in the embedded system.

The background in which we humans are embedded and with which all human activities are eventually involved has no presence in human concerns unless we consider it as being there. As we humans live in language, we are different from other living systems because we can be aware of the element in which we are embedded and of what we wish to conserve. Our awareness changes what we do conserve. Thus, although we are embedded in the biosphere, the biosphere exists for us only if we see it, and only if we see it can we conserve it.

We have lived long in the assumption that the background in which we are embedded is infinite. This attitude has resulted in many losses of what we call "resource depletions" because we wanted what was lost: wood, minerals, or fish. Most businesses live in the assumption that the background of consumers is infinite. As long as consumers remain an infinite possibility, a company can prosper through growing on an expanding base of consumers. However, what happens if consumers are not infinite? What will happen depends on what has happened with our desires by the time we become aware that the system that contains us is not infinite.

The main problem that we face as business persons—if we wish to face it—is that of creating activities for finite backgrounds.

So What Does Biology Have to Do with Business?

Commentary by David Meador

Dr. Maturana's works, including *The Tree of Knowledge*, are not on the required reading list for most of the nation's MBA programs. Why should we, as business people, pay attention to a biological approach to handling business dilemmas?

Business today is changing faster than ever before. Competition is fierce. What is the common business response? We reorganize, redesign, reengineer, and ultimately reimplement. We try over and over again to implement new ideas and methods because prior efforts failed. Why is it that a high percentage of change initiatives, such as reengineering and activity-based costing, fail in American business? Usually, the answer is linked to the challenges of dealing with organizational transformation. The bind is that if we as business people do not try the new tools and methods, we will not become more competitive and, on the other hand, many of the initiatives fail.

I believe that Dr. Maturana's paper is rich with applications for the business community. If you compare any business to its competitors, what makes one organization different from another? Many buy their equipment, tools, supplies, and raw materials from the same supply base. Usually, the difference is in the people.

Dr. Maturana's thoughts on conservation versus change speak to current reality in business. If you go into any company, you will find it's share of "change initiatives" led by "change agents." I wonder, if we had a conservation department, what its focus might be? One example might be on maintaining core beliefs and values.

Another area that requires more exploration is that of implications of language in business. To remain competitive, we constantly are looking for innovation, process improvements, and quality enhancements. Again, what is at the core of that activity? Usually, people are. Dr. Maturana's thoughts on the coordinations of coordinations of coordinations of behaviors is relevant. Sometimes, I wonder whether the business community has focused on the high leverage point of the system. All of us are aware of failed initiatives, quality failure rates, rework, and marketing fiascoes. We also can find examples of extraordinary results in teams and business units. What is the difference? I would advocate that the latter included effective coordinated action and that language played a large role.

In business, we continue to look for ways in which to create environments wherein people can be inspired, motivated, excited, and passionate about their contribution to the organization. Dr. Maturana helps to explain some of the elements required to move in that direction. These elements include respect, lack of aggression, reflection, emotional intelligence, acknowledging the intelligence of others, and relaxation.



David Meador

For me, Dr. Maturana reconfirms some of my learning journey. I am reminded that if I want to lead transformational change in an organization, it happens one person at a time, but it starts with me. Tools and such skills as inquiry, deep listening, and reflection are relevant leadership skills. If I am to lead transformational change, I must hold deep respect for the individuals in the company and must honor diversity. I realize that in doing so, I can expand the creativity of the organization. What does biology have to do with business? Everything!

What Do I Wish to Conserve?

Commentary by Dennis Sandow



Dennis Sandow

In this first article of the Biology of Business series, Maturana and Bunnell have offered us a vision. This vision invites us to consider our history as an unfolding conservation of those things, relations, and emotions that we desire. The clarity of this vision is not enhanced by the creation of an abstract model but instead by how we see the living of our daily lives. I am very honored to have been asked to comment on this article and will offer my personal history as an example.

Maturana's biological theory of cognition fundamentally changed my perspective on the world. As a research assistant at the University of Oregon, I had compartmentalized my life. These were tidy organizers. My work had been to view others from a detached point of view based on hypotheses generated by other researchers in other universities. At NEC America in Hillsboro, Oregon, my colleagues and I studied a group of workers supporting a co-worker named Karen with developmental disabilities. While working, the NEC workers would talk about how they might help Karen. Supportive social interactions created a support network, which created new support interactions, and so on. This network of support for Karen was self-producing. The social support network not only created support—it created itself. From the process of supporting Karen, a support network was created.

This experience at NEC was personally disturbing. I realized that while doing the business of NEC, employees simultaneously supported disabled employees. This situation led to my questioning what I was creating while doing the business of the University of Oregon. This question led me to reflect on my own social network of coordination of activities and, as a result, I called on a close friend at Wacker Siltronic in Portland. Through my relations with Wacker Siltronic employees and others, Ken was hired in 1990.

Ken also was a person with a developmental disability. Unlike Karen, he had spent most of his life locked in a state institution. He was told that he could not survive socially outside the institution. Once again, Wacker employees created a support network that supported Ken in his new job. Ken now lives in Portland in his own condominium. He no longer is on welfare or public subsidies but instead is a taxpayer. The State of Oregon has saved hundreds of thousands of dollars. All of this came from a group of employees who not only did the business of Wacker Siltronic but also wished to support Ken.

Maturana's vision has caused me to reflect on how I do what I do from day to day. What is it that I wish to conserve, and how do I go about doing so? What is being conserved in my network of networks? I have studied the social conservation of support for children, people with disabilities, and wetland prairies. The ordinary daily life in business has become extraordinary, as in the examples of Karen and Ken. Is the conservation of these and other desires to serve people and the earth transformative, as claimed by Maturana? I can answer only for my own life: Yes!