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Heinz von Foerster and the
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Blunting the Edge of Second-Order Cybernetics: The Heritage of Heinz von Foerster

Stefano Franchi ◊ Texas A&M University <franchi@philosophy.tamu.edu>

In his prologue to an interview with Heinz von Foerster I conducted several years ago, Francisco Varela (1995) wrote that “As the dust settles with time, the role of Heinz von Foerster in contemporary science becomes sharper and more vivid.” Although Varela meant those words as a homage to the scientist who – as he recounts – played a decisive role in his professional and intellectual development, I think we could and should wish a different fate for his work. Since its inception and long after its eventual and perhaps provisional demise, second-order cybernetics had the gift of producing sharply divided opinions about the scientific relevance of its theories and results. Against the undivided enthusiasm of the participants in von Foerster’s intellectual adventure – his students and collaborators, the visitors and fellows at the BCL, etc. – stood the hostile skepticism of the vast majority of the scientific community. Whereas some hailed him as one of the greatest minds of the century, others dismissed him an intellectual fraud. The heritage of second-order cybernetics needs *less* sharpening – it needs to be brought into a blunt confrontation with the disciplines it helped create and those it antagonized. It needs a broad and far-reaching discussion of its assumptions and history, its conceptual tools, and its implication for current work in cognitive science as well as all the discipline pertaining to the explanation, simulation, and potential replication of cognitive abilities.

The collection edited by Albert Müller and Karl H. Müller is an excellent step towards this goal. Its aim is to provide a two-fold access to von Foerster’s legacy and his work at the *Biological Computer Laboratory*, the institution he founded and directed at the University of Illinois at Urbana-Champaign from 1958 to 1976. The first approach is biographico-historical. The first half of the book presents a historical portrait of BCL through a collection

of nine interviews and personal recollections from several of von Foerster’s former colleagues and students in Urbana (Maturana, Beer, Inselberg, Umpleby, Weston, Martin, Glanville, Pangaro). These contributions provide an excellent reconstruction of the intellectual atmosphere at the BCL and its leading problems, as well as the manner in which the problems were addressed. It prepares the terrain for the second, theoretically oriented part of the volume. It is here that we find an extensive assessment of von Foerster’s legacy, a historical analysis of the eventual institutional failure of BCL, and a sustained effort toward extending its insights to the present scientific situation. The most interesting essays are contributed by the editors, who are alone responsible for more than half of the second part’s content (4 out of 9 essays, or 136 pages out of 240 in total). The historical contributions by Albert Müller shed much light on the accomplishments of the BCL and, especially, on the circumstances that brought it to its eventual demise in 1976. In spite of their relative brevity, the essays are invaluable. To my knowledge, this is the first time that BCL’s history has been dealt with at this level of detail. Even the (relatively few) book-length accounts of cybernetics’ history – such as Steve Heim’s and Jean-Pierre Dupuy’s – say relatively little about the topic. Although one of the two pieces – the brief history of BCL – had already appeared in German, its re-publication with the new, original contribution about BCL’s end puts it in a new perspective and provides a very powerful account of BCL’s role within the scientific paradigm(s) of the 1960s and 1970s. These two essays are completed by the excellent historical contributions by Peter Asaro and Karl H. Müller. Asaro provides a detailed description of the main “monsters” produced by von Foerster’s group (to use Andy Pickering’s apt metaphor) in the context

of the contemporary biological and bionic cultural environments. Müller's essay is a brief but fact-filled review of the scientific landscape in the years immediately preceding the birth of BCL.

The final article by Karl H. Müller is the longest and the most theoretically ambitious of the whole volume. Müller tries to provide, on the basis of von Foerster's work, a general theoretical account of the fundamental components of second-order cybernetics. He then investigates the possibility of revitalizing and extending it into the 21st century, thus completing the unfinished revolution von Foerster started. Although Müller recognizes that second-order cybernetics was more of a vision than a theoretical framework guiding empirical research, he declares quite confidently that it "possessed all the ingredients of a revolutionary trans-disciplinary research program not only across biology, the cognitive neurosciences, cybernetics and the social sciences, but also across the conventional roles of scientists, objects of discourse and self-reflexivity" (p. 409). Perhaps out of implicit respect toward the prevalently empirical and engineering work carried out at BCL, Müller's formulation of his main thesis inverts the proper logical order. As the narrative organization of the article makes clear, the first step towards revitalizing second-order cybernetics is necessarily provided by the philosophical disciplines, which will have to work out a new grounding for the empirical and formal sciences. As Müller repeatedly emphasizes, the ambition of second-order cybernetics is to provide a new *Scienza Nuova*. However, his linguistic prudence prevents us from seeing how relevant (and perhaps unexpectedly so) von Foerster's work is to philosophy *tout court*, how much it can contribute to it and how it can benefit from an extensive dialog and confrontation with it.

At the end of his discussion of the various possible conceptualizations of the observer-observed relationship, Müller states that he has sketched a perhaps "unusual epistemological position." The terminology is misleading, because the problems raised by von Foerster with his second-order cybernetics (SOC) are not epistemological at all. Or, to put it better, they are not *primarily* epistemological – they belong to the realm of ontology and only secondarily to epistemology. SOC was concerned with the role of the observer observing an

environment and (possibly) extracting/constructing information from/about it. This science-oriented terminology of observers and observed, however, prevents us from seeing the real scope of the problem at issue. In von Foerster's mature writings, this newly-fangled "observer" is none other than the good old-fashioned *subject* considering *properties of objects in the world*. Thus, the problem of SOC is the problem of the subject/object relationship. In other words, it is the problem of metaphysics, or the problem of *being*, as recent philosophers often call it, and the issue raised by SOC – namely, the problematic relationship between the subject and its sometimes passive, sometimes active, sometimes constituting relationships to the object – has always been at the core of Western philosophy since the pre-Socratics. Once it is put this way, it is easy to recognize among the various alternative views of the observer/observed relationship sketched by Müller some of the suggestions advanced by philosophers in the last century. I will just mention that the claim about the necessary context-dependence of any "objective" feature (Müller's second form of self-reference) could easily be translated into the first-Heidegger/late-Husserl notion of the world as the necessary referential horizon of significance underlying any statement and interpretation. Besides being aligned with Müller's claims about the intrinsically trans-disciplinary character of SOC, this reformulation of its basic problem into the language of phenomenology would allow it to enter into a more fruitful dialog with the phenomenological literature. For instance, Müller defines as "radically deconstructive" the extreme form of observer-dependency (p. 420). The use of the term "deconstruction," however, is misguided if not altogether wrong, especially when the ontological position it is supposed to summarize is in fact a form of subjective idealism closer to Bishop Berkeley's theory than to Derrida's. The main goal of classic deconstruction (i.e. the approach practiced by Derrida in the 60's and early 70's) was exactly the opposite: namely, to show that the "observer" (or subject) is neither the author nor the inventor of properties and information as much as the *product* of a field of forces (or *differences*, as Derrida liked to call them then) which are always caught in unstable configurations and which are constantly about to move forward, as it were. Derrida was keen to

point out that being can never be reduced to either subject or object (observer/observed) or to a neat partition between the two, because there is always a remainder, an inevitable supplement to any neat categorization of the world, and it is precisely this supplement that contains the seeds for the ever present possibility of a radical overturning of a specific configuration. Derrida's was, in other words, a theory about the status of the world (or "context," in Müller language), its dynamic structure, and its provenance. It would be very interesting to bring second cybernetics's insights, and its much closer relationship with the empirical sciences, into close contact with the results achieved by deconstruction.

These few remarks are meant to stress how stimulating Müller's ambitious essay is, and how representative of the general tone of the volume it is. It should be said that the exposition is very terse. Given its very ambitious and broad theoretical agenda, the text should probably have been two or three times as long to be properly argued, and we are looking forward to reading the book of which this essay is undoubtedly a condensed extract.

The remaining contributions come from the von Foerster lectures delivered in the years 2002–2004 by Siegfried Schmidt, Dirk Becker, and Ranulph Glanville, plus an article by Ernst von Glasersfeld. Although interesting in their own right, the content of the lectures tends to be slightly tangential to the main focus of the book, as the lecturers – as it is their right to do – are more keen in developing their own versions of second-order cybernetics than in expanding or assessing von Foerster's insights. It may be said that they are closer to Heinz's spirit than the present reviewer, who would have preferred to see more of the historical and theoretical analysis pursued by Asaro and the Müllers. My preferences notwithstanding, this volume represents a precious contribution for the understanding of BCL, a crucial but still not properly understood chapter in the history of cybernetics and, more generally, of cognitive science. It is greatly recommended.

Reference

- Varela, F. J. (1995) Heinz von Foerster, the scientist, the man. *Stanford Humanities Review* 4(2): 285–288.