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Physics and Anthropology: A Personal Account by the New President of the Wenner-Gren Foundation

by Heinz Von Foerster

The Editor has asked me to explain why I—a physical scientist—was chosen to be President of an Anthropological institute—and why I accepted the appointment. The Board of Directors will have to be asked why they selected me for this position. On the other hand, I may be able to explain why I accepted this offer despite my present joint appointment as Professor in the Departments of Electrical Engineering and Biophysics at the University of Illinois—two disciplines which are by no means linked to anthropology in any obvious way. Permit me to go back a bit more than half a century to show that this apparent *mesalliance* is in fact a legitimate affair.

I was born into a delightful, typical Viennese family of mixed Germanic, Slavonic and Jewish extraction, with artists, craftsmen, engineers, peasants, architects, and lawyers as ancestors. As a boy I wanted to become a "Naturforscher," which in my mind was a romantic mixture of Fridtjof Nansen and Maria Curie. Despite this dream of glory, I was always a miserable student who never did his homework: in the natural sciences I felt it was trivial, and I just did not have time for the humanities. There were too many other things to do—skiing, mountain climbing, "working" at night in a jazz combo, and developing great new "illusions" with a cousin of mine in an unsurpassed magic act. College broke up the act, and I went into physics, because if I ever wanted to know anything about nature, I had better study her laws. I was soon captivated by a new kind of magic, that of the "Viennese Circle," a small but vigorous group of philosophers of science. Wittgenstein, Schlick, Menger, and Carnap influenced me deeply, and I began to grasp the fundamental difference between the world as it is, and its symbolic representation in language or equations. I wanted to learn more about the peculiar relation between the observer and the observed, by learning more about the observer.

The war put an end to such high-faluting thoughts. But magic again saved me to emerge unscathed in mind and body. After working during these years in various research laboratories in Germany on plasma physics and microwave electronics, I arrived in Vienna in 1945, with a wife, three

children, and borrowed shirts, pants, and shoes, just in time to help set up the first post-war radio station, whose science and art program I directed until 1949. At the same time I tried to help one of Austria's telephone companies produce dearly needed equipment. These fascinating times of exhaustion, turmoil, and spiritual rejuvenation stimulated me to return to my old riddle of the nature of the "observer." With the encouragement of two wonderful men, the psychiatrists Victor Frankl and Otto Pötzl, I published an outline of a quantum mechanical theory of physiological memory.



HEINZ VON FOERSTER

In 1949, I visited friends in the United States, and I became the man who came to dinner and stayed for the rest of his life. Soon after my arrival I had the good fortune of meeting Warren McCulloch, then professor of neuropsychiatry at the University of Illinois, who not only had the data for my theory of memory, but who also introduced me to the campus in Urbana, where, again, magic opened up a position as director of the Electron Tube Research Laboratory in the Department of Electrical Engineering. Through McCulloch, at conferences about "Cybernetics, Circular Causal and Feedback Mechanisms in Biological and Social Systems" sponsored by the Josiah Macy Jr.

Foundation, I met those people who laid the conceptual foundation for comprehending the behavior of the "really" complex systems, the teleological systems, and the self-organizing systems. Among these people were Gregory Bateson, Julian Bigelow, Heinrich Klüver, Margaret Mead, Filmer Northrop, John Von Neumann, Norbert Wiener, and many more. My English at that time was so poor that the participants in these meetings appointed me editor of the *Transactions* so I could learn this language the fast way.

I was so fascinated by the ideas that arose from these meetings that, after 7 years of research in microwave tubes and ultra-high-speed oscillography, I asked for permission to go on sabbatical leave. Fortified with the honors and support of a Guggenheim Fellowship, I finally set out to learn more of the neurophysiology of my enigmatic "observer." After one year under the tutelage of Warren McCulloch now at M.I.T. and Arturo Rosenbluth in Mexico City, upon my return to the University of Illinois, thanks to the magnanimity of my department, I was encouraged to establish the Biological Computer Laboratory, where we study computational principles in living organisms. Problems of cognition, self-repair, and self-organization led us from the investigation of the structure of organized cell assemblies to the study of the structure of symbolic representations. In these studies I have learned that we cannot understand the single element unless we see it as part of a magnificent whole. Thus if I want to know something about my "observer"—that is man—I have to see him as part of the whole—the family of man.

When the Wenner-Gren Foundation invited me to join its forces, I accepted with enthusiasm. It permits me to associate with people who are at the end of my line of questioning. I sincerely hope that my background can be of some service to this ever-widening, fast-growing scientific community.

Heinz Von Foerster was born November 13, 1911, in Vienna, Austria. He received the Physics Engineering Diploma from the Institute of Technology, Vienna, in 1935, and the Ph.D. in Physics from the University of Breslau, Germany, in 1944. He is married and has three children.

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 Director, Biological Computer Laboratory, University of Illinois, 1958.
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