

Heinz von Foerster and the Mansfield Amendment

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Heinz von Foerster was the founder and director of the Biological Computer Laboratory (BCL) at the University of Illinois in Urbana-Champaign. BCL existed from 1957 to 1976. In 1976 Heinz retired and moved to California. One revealing story about Heinz and the Biological Computer Laboratory concerns the Mansfield Amendment, which led to the closing of BCL. I was a graduate student at the University of Illinois from the late 1960s until 1975.

Cybernetics, as a field, originated in the late 1940s and early 1950s during a series of ten conferences sponsored by the Josiah Macy, Jr. Foundation. The conferences were held in New York City and were chaired by Warren McCulloch. The conferences were attended by people from philosophy, mathematics, engineering, neurophysiology, and social science (Heims, 1991).

In 1956 at a conference at Dartmouth University a split occurred. The engineers felt they had made significant progress in programming computers to emulate some aspects of human intelligence. They preferred to proceed on the basis of somewhat ad hoc assumptions about the nature of intelligence, human or machine. The neurophysiologists and philosophers preferred to continue their research on neurophysiology. They felt they had much to learn about the functioning of the human nervous system. From this time forward the fields of artificial intelligence and cybernetics developed largely independently in terms of communication among researchers. However, various agencies in the Department of Defense, for example the Office of Naval Research and the Air Force Office of Scientific Research, continued to support both groups. In the 1960s BCL was the leading center for cybernetics research in the U.S. Most of the money came from the Air Force.

In the late 1960s there were protests on college campuses against the war in Viet Nam and against military research being done on campus. The Department of Defense (DOD) funded quite a lot of research on campuses, but most of it was basic research not related to military activities. In an effort to calm the anti-war protests on college campuses Senate Majority Leader Mike Mansfield, a liberal Democrat from Montana, proposed the Mansfield Amendment. This amendment to the Defense Procurement Authorization Act of 1970 required that DOD only support basic research “with a direct and apparent relationship to a specific military function or operation.” (Hauben, 1999) Apparently the intent was to diminish the DOD presence on college campuses.

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During World War II, Heinz had conducted research in Germany, but he had conducted only theoretical research that had no military applications. Following the passage of the Mansfield Amendment each researcher who had been receiving DOD funds was required to explain the relationship of the research to a military mission. Heinz replied to this question that the research at BCL was not related to a military mission. Hence, the people in DOD could provide no further funds to support the research in cybernetics that BCL had been doing.

When faced with the same question the people doing research on artificial intelligence and robotics became creative. They imagined a variety of futuristic electronic and robotic devices on battlefields. These science fiction-like descriptions proved to be quite popular in Washington, DC. The funding agencies within DOD used them to request more research funds from Congress. The members of Congress were favorably inclined. They reasoned that the more automated the battlefield was, the fewer soldiers / voters would be killed or wounded.

In 1971 Congress created a new program, Research Applied to National Needs (RANN), within the National Science Foundation (2003). At BCL people hoped that this program would continue some of the non-military research that DOD had been supporting. There were two problems with RANN. First, it focused on applied research rather than basic research. The interdisciplinary, basic research that DOD had been funding had no obvious place to go. Second, the people in RANN were a different group of people from the people who had been funding cybernetics research within DOD. The new people were not familiar with the previous work that had been done in cybernetics and so lacked the background necessary to evaluate research proposals in this field.

With research from DOD at an end, Heinz applied to RANN for support of the BCL research on cognition and “experimental epistemology.” However, the reaction of the people in RANN was that the people at BCL did not understand the philosophy of science. They held the conventional view that science involved removing the observer from scientific observations, not paying attention to the observer. Hence, the BCL proposal to RANN was rejected. BCL then sought funds from private foundations with some success but not sufficient success to continue the work of the Laboratory. Rather than return to teaching undergraduate engineering courses, Heinz chose early retirement. Ross Ashby and Gotthard Gunter had returned to Europe a few years before. When Heinz left the University of Illinois, BCL and its basic research in cybernetics came to an end. Although the Mansfield Amendment was later repealed (Hauben, 2003), it had had the unintended consequences of curtailing basic research in cybernetics in the U.S. and increasing funding for artificial intelligence and robotics, particularly if the research had a plausible link to a military mission.

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