

MINDWALK: SYSTEMS PRACTICE IN HOLLYWOOD

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Mindwalk is a Hollywood movie which praises systems theory, claims that the contemporary scientific world view is changing and advocates a similar change in thinking by public officials. The film stars Liv Ullmann, Sam Waterston, and John Heard. It was directed by Bernt Capra and is based on Fritjof Capra's book *The Turning Point*. Ullmann plays a physicist, Waterston plays a failed U.S. Presidential candidate, and Heard plays a poet and speechwriter. They meet at Mont St. Michael in France and spend the day discussing the state of the world. The message of the film is the need to change from a mechanistic or early scientific view of the world to an ecological or more modern view and to have this change in perception be reflected in public policies.

In the course of the conversation Ullmann's character mentions by name Ilya Prigogine, Gregory Bateson, and Humberto Maturana. A serious film treatment of systems theory is not something that I expected to see in my lifetime, so I am reluctant to criticize it. However, a serious effort merits serious comment, and in that spirit I offer what I hope is a balanced review.

Ullmann says that researchers agree that economic prosperity slows population growth. This view, called the demographic transition theory, is currently being challenged (Abernethy, 1991). The newer theory holds that fertility declines when people have a sense of limits. That is, when people feel that large families bring benefits, emotional and/or economic, then they have large families. However, when people feel that large families bring mostly costs, emotional and/or economic, then they have smaller families.

The statement, "The secret of life is self-organization," brings a laugh in the film, as well it should. The statement is a perfect example of an "explanatory principle" as discussed by Bateson (1972) in his "metalogue" on instinct. Fortunately, further explanation of the statement follows.

However, the discussion of self-organization perpetuates a confusion in the literature. Is a self-organizing system an organism which exists in an environment (Von Foerster, 1960) or is it the combination of the organism and its environment (Ashby, 1962)? The film uses the term both ways but does not distinguish the two definitions.

The film associates the ideas of Descartes with the mechanistic world view. It then criticizes the applicability of these ideas to the contemporary world, while still insisting that they were an important contribution in their time. Unfortunately the film does not say very clearly what the system of beliefs was that the mechanistic, or early scientific, world view replaced. Mont St. Michael, an example of the medieval world of cathedrals and torture chambers performs this function in a visually stimulating manner but not in a way that provides a completely satisfying description of the medieval belief system.

Using a tree as an example, the characters consider the distinction between reductionism (to understand an object, look at its parts and how they work) and holism (to understand an object, look at its relationships with other objects in its environment). How this philosophical distinction works in practice is covered in a discussion of a gall bladder operation.

The most distracting parts of the film are the opening scenes which apologize for its intellectual nature. In my opinion the apology is unnecessary. Surely a film about the search for understanding, for a morally defensible lifestyle, and for an ennobling career need not be defended amidst so many films about car chases and bank robberies. After all, college students, perhaps the group most likely to view the film, are one of the largest groups of movie-goers.

The plot of the film concerns how each of the three characters is dealing with a mid-life crisis. But the substance of the discussions often seems tangential to these personal concerns. A closer connection between the emotional plot and the substance of the conversation could have been achieved if the discussion of atomic structure had been replaced by a discussion of constructivism or second order cybernetics. But Capra is a physicist, and his explication of atomic structure is captivating.

Nevertheless, the awe and wonder with which the film presents the theories of atomic physics felt awkward to me. The scientists that I know are motivated by wonder in the sense of curiosity, not by wonder in the sense of awe. Physicists generally "humanize" their discussions of atoms with humor rather than with awe. As just a few illustrations, a unit of measurement at the nuclear level is the "barn" (big as a barn). Properties of sub-atomic particles include "strangeness" and "charm." Niels Bohr, upon hearing a presentation by an assistant, asked a colleague, "Is this theory crazy enough?"

The only people I can recall who have used awe in describing science have been Fritjof Capra and Carl Sagan. But since they are two of the most successful contemporary popularizers of science, perhaps they are on to something.

The film is effective not only in discussing ideas but in demonstrating them as well. In accord with current thinking, the role of metaphor in explanation is emphasized repeatedly. By presenting ideas in the form of a conversation the film avoids an "objective" point of view. Hence, the manner of presentation is consistent with contemporary work in epistemology. Many nature films have made similar points about the environment, but they are generally narrated from a single point of view and hence embody an earlier epistemology.

The tension between theory and practice, between reflection and action, is treated in the career decisions made by the three characters. Although the discussions do not probe deeply, the issues are raised, and not as abstractions but rather as existential choices.

The character of the poet is the least well-developed. His function in the film seems to be less to present a humanistic perspective than to prevent a bipolar debate between the scientist and the politician. The fact that the film was made at all and the design of the film illustrate the tension between theory and practice and the value of a humanistic perspective at least as effectively as does the dialogue.

One of my students, Mike Preis, recently asked, when referring to an article by Torbert (1983), "Is it properly called science when the research question is phrased, 'Can human beings in concert develop an attention so active that it simultaneously listens back toward its own origin, sees through the ironies of thought's metaphors, tastes its embodiment, and recognizes the aesthetic effects of its lifetime in the externally visible world?'" The answer, of course, is yes. That is the motivation which has guided the development of systems theory and cybernetics. *Mindwalk* demonstrates this motivation as effectively as any presentation I can recall.

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