Klaus Krippendorff

On Systems Thinking

Pp. 13-21 in Paul Broholm and Nic van Dijk (Eds.).
Systems Thinking and Social Science,
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I. Asking "What is a system?" defines a decision or identification problem that should be answerable with "This is ....." or "This is not ....."

The question often results in a struggle over definitions, a useless struggle. A better question is: "Which criteria do we want to use to define a system?"

a) Logical criteria (true or false). These tend to be ignorant of linguistic relativity, of the social roles of definitions, etc.
b) Social argument (agreement - consensus type criteria). This argument recognizes the arbitrariness of definitions, but rarely the consequences of adopting the definition.
c) Purposive argument (means-to-an-end type criteria). This argument is unaware of reification (that definitions may become true as they are applied) as the controlling agent of intellectual work.

My preference:

d) Interactive argument (to be discussed later).

The struggle over definitions is also found in less ambiguous settings, for example when one tries to answer
What is a social group?
What is an organization?
What is society?

II. Rather than taking a definitional approach, a better question (leading to interactive arguments) would be:
Why does an observer approach an object (her object)?
The answer to this question has several aspects.
1) There are preconceptions: a) cultural definitions of what is.
b) abstract theoretical commitments of how to see reality.
c) detailed, culturally-coded knowledge about the object.
2) There are unknowns and uncertainties which appear within the pre-

2) There are unknowns and uncertainties which appear within the preconceptions (1) and which need to be removed.
3) There is interest in the unknown, something is worth knowing according to culturally-approved norms. Curiosity is also approved within certain limits.

We can answer why an observer approaches an (her) object by looking at data collection. The process of data collection is critical to how the object under observation is understood. That is, the understanding of the object affects the process of data collection, which then affects the understanding of the object.

All social scientists (qua observers) collect data, but they differ in how they assemble their data.

1) Historians seek a "coherent picture" of historical facts as transmitted through surviving documents. They search for a single organizing principle (the personality of a hero, national events, the rise and decay of empires).
2) Psychologists are concerned with samples (of subjects, voters, families). They search for statistical regularities within a population of disconnected (independently observed) individuals.
3) Ethno-methodologists or anthropologists bring preconceptions to the scene of their observations, but allow themselves to be modified. The ideal is a description of the conceptions that are indigenous to a culture.

Systems researchers are not satisfied with any of these approaches:

- neither with the historian's network of knowledge that is connected through a single organizing principle;
- nor with the psyschologist's interest in finding properties that are generalizeable to a population of separate individuals;
- nor with the anthropologist's concern with conceptions held by members of a group or culture.

III. All systems researchers might oppose the three preceding approaches on the ground that none assembles the data so that interconnection and dynamic are made clear. (The historian is concerned only with one

aspect of a large system; the psychologist ignores that with which systems researchers start out: the relations between individuals; the ethno-methodologist believes that the system is reflected in its members' heads, and that this is a sufficient explanation).

On the other hand, systems researchers are not so unified in what they consider a system to be. There are different epistemological perspectives which lead to different ways of defining or identifying systems.

Figure 1. EPISTEMOLOGICAL APPROACHES TO SYSTEMS (S = System)

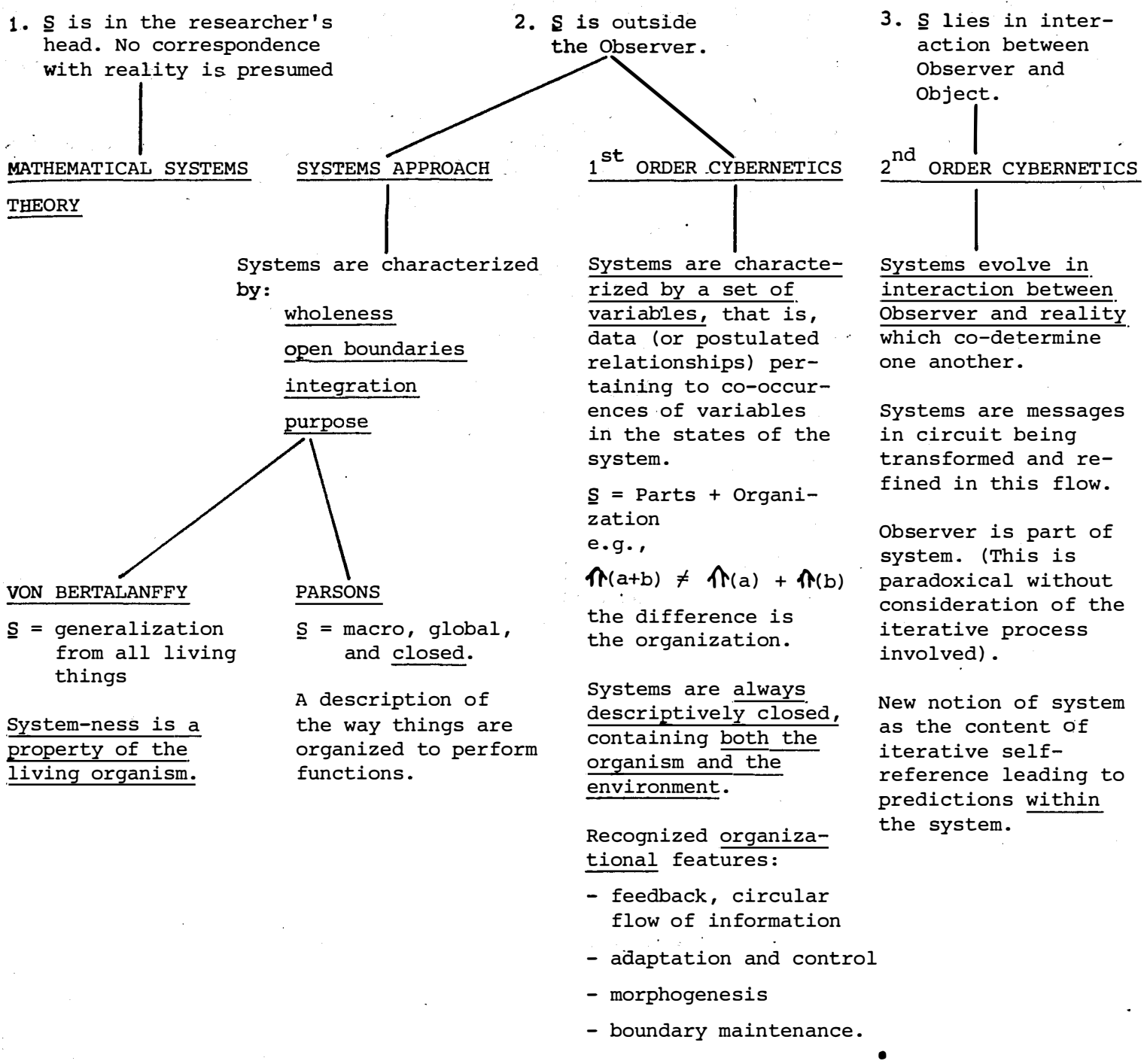
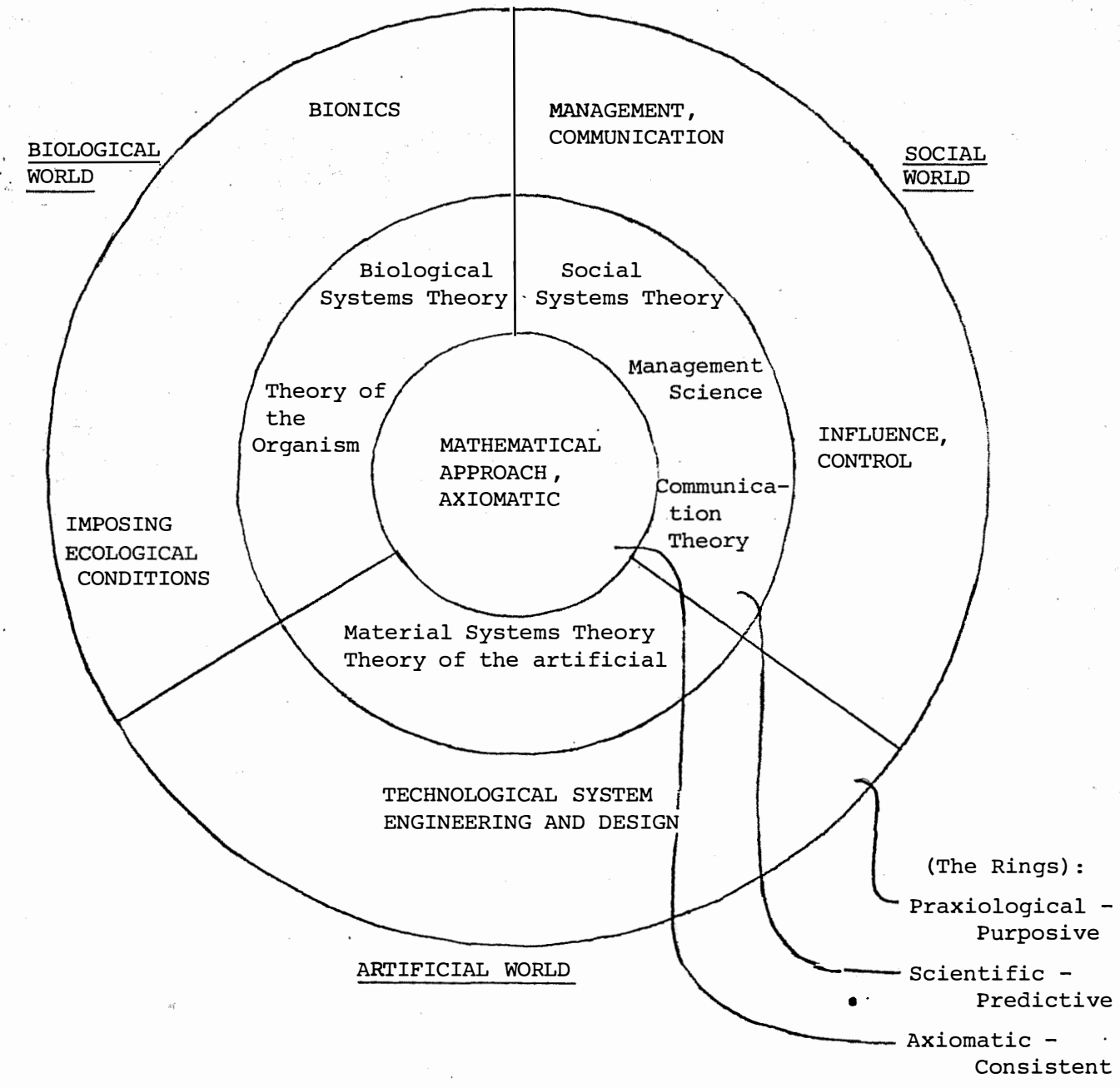


Figure 2A. CLASSIFICATION OF SYSTEMS[1]



[1] Professor Dr. Helmar Frank used essentially these ideas in his overviews of cybernetics, but the diagram is derived from one developed independently by Krippendorff,appearing in "Values, Modes and Domains of Inquiry into Communication", in The Journal of Communication, Vol. 19, June,1969: p. 105-133.

Figure 2B. THE LOGICAL FLOW OF IDEAS

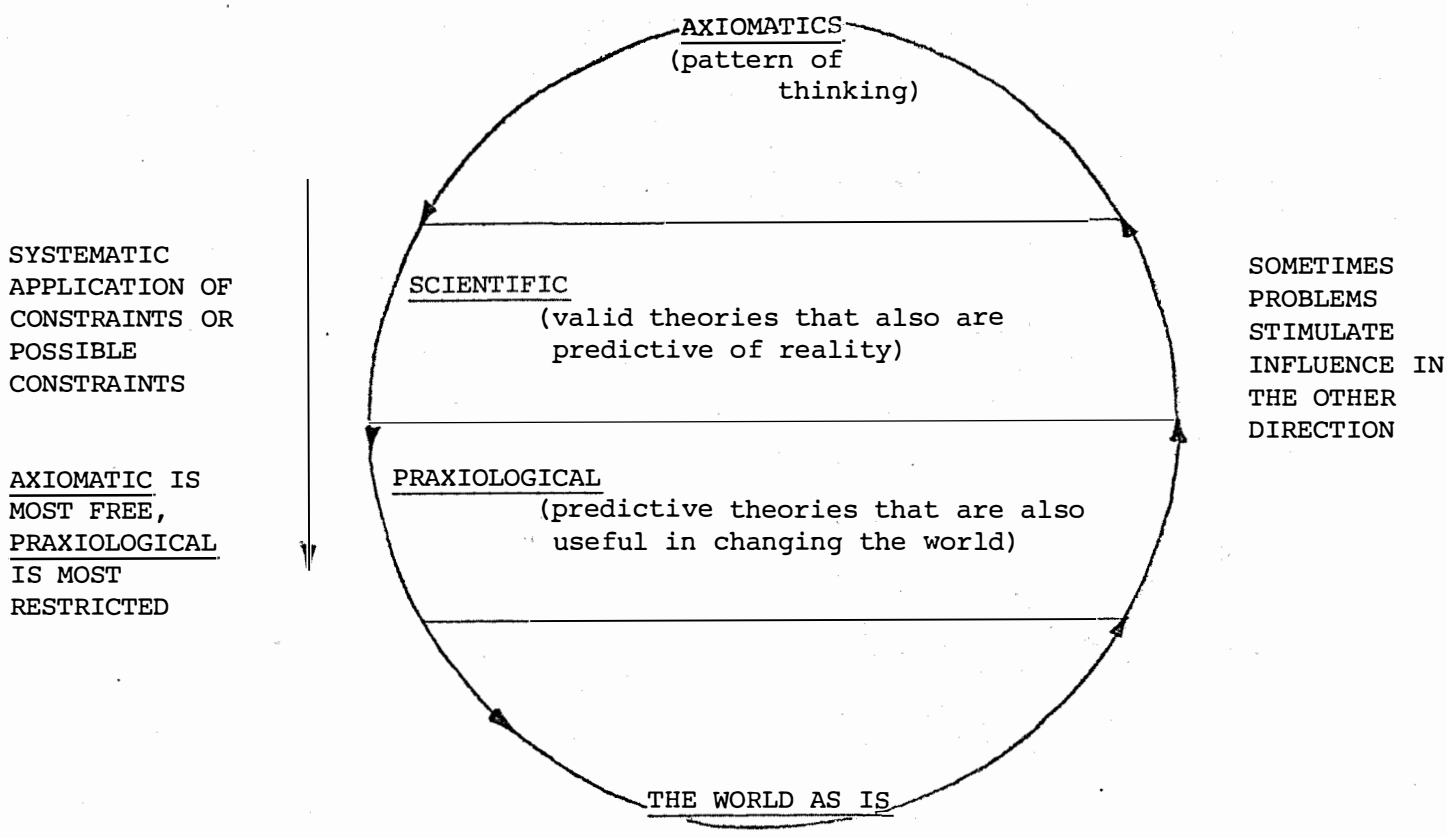
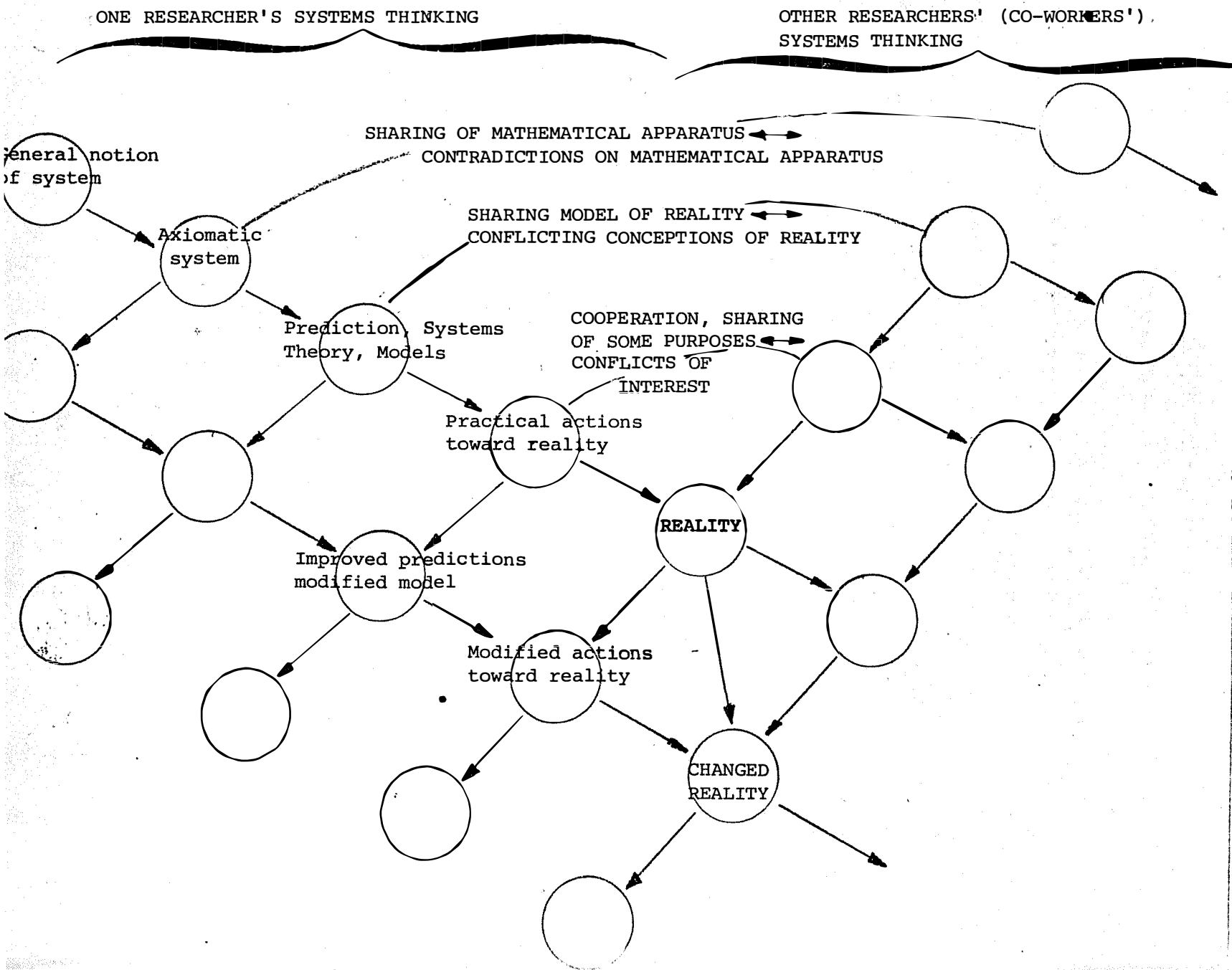


Figure 3. THE GENERAL PATTERN OF THE EVOLUTION OF KNOWLEDGE FROM A SYSTEMS PERSPECTIVE

* There is interaction between observer and reality
* In the course of the interaction, variety (in both observers and reality) is systematically reduced so as to conform with properties that exist on several levels of Systems Thinking; axiomatic; scientific; praxiological.



From the point of view of 2nd order cybernetics, reality is shared through interactions between observers using that reality as a medium. Except through the medium of language purposes, conceptions, and formal patterns of thinking are shared with others only through a feeling that they are consistent with the interactions.

Currently, there exist agreements (sharing) on the general notion of system, i.e., axiomatic system theory. But there is less sharing when it comes to predictive models and practical actions derived from them.

IV. In closing, permit me a few responses to the "Premises of Systems Thinking". [Krippendorff is referring to the "Notes", to be found elsewhere in this report, Eds.].

1. WHOLISM.

It is no problem to show differences between a whole and its parts. Praxiological approaches may impose wholism on reality, but scientific approaches should not. They should regard wholism as a special and testable case.

2. OPEN-CLOSED SYSTEMS.

One should note that boundaries are always chosen by an observer to separate what is inside and what is outside. Once the boundaries are drawn the explanation is restricted to what is within the boundaries. If you add something, you change the boundaries. Hence all systems are observed as closed. (They are descriptively closed).

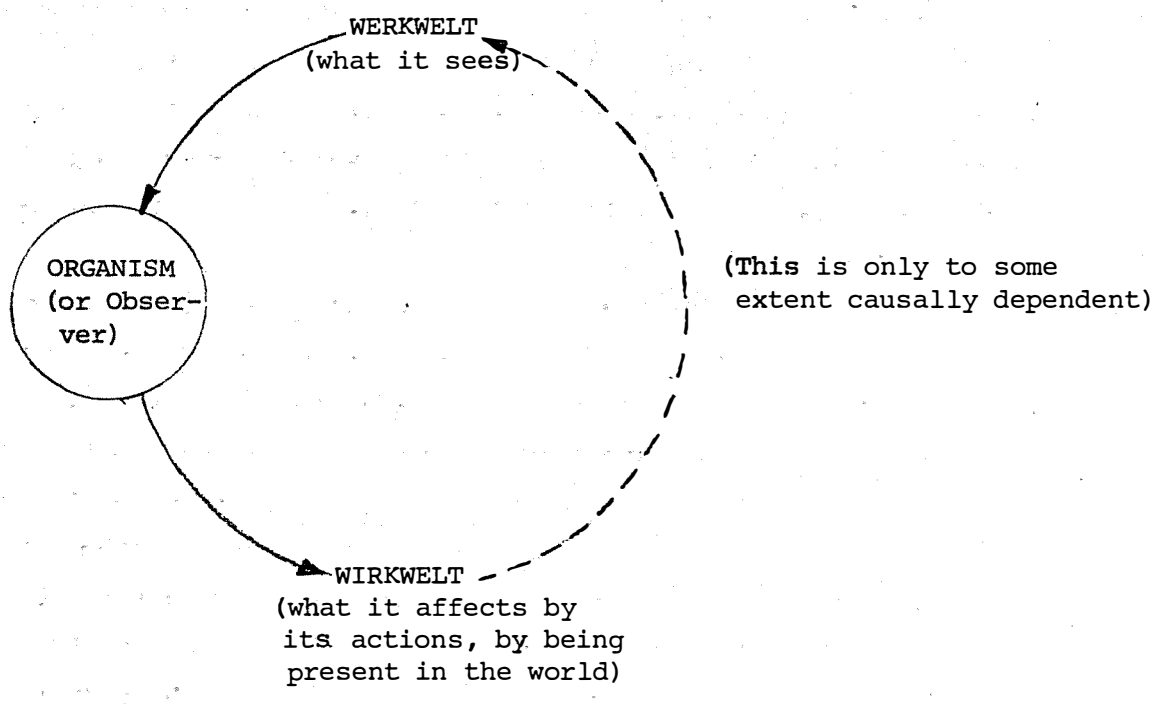
3. HIERARCHY.

Hiearchy is usually imposed by the observer onto a portion of reality. It is a property of our brain to think that way about the organization of the universe, social reality, or biological systems.

But the imposition of hierarchy is not always accurate. Look at the human organism. There are many centers or "tops" of the hierarchy besides the brain: the heart, the liver. Actually, every vital organ can be thought to be on top.

Most of these premises [in the "Notes"] arise out of separating the observer from the observed object. I prefer to look to Von Uexküll who described biological organisms' interaction in the world in the following way (see Figure 4.).

Figure 4. THE ORGANISM *IN* THE WORLD (After Von Uexküll[2])



Back to systems theory and concepts.

- Were there no systems before Systems Theory?
- Are we creating systems by describing a portion of the world in that way?
- Are we responding by conceptually approximating a reality?

By putting these together and saying they are all true we have the perfect, self-reinforcing cycle within which systems are realized in continous interaction with the world. Systems are in the circuit of interaction.

[2] Jacob von Uexküll
Umwelt und Innenwelt der Tiere, Berlin, 1921.
Bedeutungslehre, Streifzüge durch die Umwelt von Tieren und Menschen, Frankfurt, 1970.