

Manifesto

Towards a new generation of Systems Science Societies

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We are living times in which there is a large number of societies around the world *formally* and *explicitly* devoted to Systems Science (or *Systemics*), intended as *corpus* of Systemic principles. They reflect the existence of an archipelago of expressions, concepts and approaches related to Systemics and defined at a very different levels of precision and angles of observation, such as Systemic principles, Systemic approach, Systemic properties, Systemic problems, Systemic, Systems Dynamics, Dynamical Systems, Systemics itself, Systems Theory, Systems Thinking, Systemic View, General System Theory and Living Systems Theory.

Their activity is often based on *generic* assumptions produced by lack of rigour and precise definitions of the concepts used, often defined in very different ways.

This is one of the reasons why there is no comprehensive theoretical *Introduction to General Systems Theory* available in the literature, but, rather, introductions stemming from disciplinary contexts. It would be more appropriate to speak of a *history of systems thinking* and a collection of approaches having some common features, but these are still far from allowing the establishment of a general theory.

Systems societies have thus progressively adopted a *generic* rather than *general* approach to systems, while the challenge was precisely that of developing a theory of generalization.

This is well represented by the focus placed on very old ideas, such as contrasting *soft and hard* approaches, *qualitative and quantitative* in an age of increasing interdisciplinarity (i.e., *same* properties considered in *different* disciplinary contexts). The practice of interdisciplinarity is often confused with *popularizing* and *convincing*.

The use of stereotyped concepts, neither supported nor updated with knowledge of current research, is often used to deal with complex issues in an *incompetent* and superficial way (i.e., without *supporting* disciplinary knowledge), hidden by the pretension of judging the systemic content of a given field. One example is the usage of the concept of *conventional science* to refer to specific disciplinary contexts ignoring how they produced, within their context, several *fundamental* systemic results by using interdisciplinary models and tools. These include the concepts and theories of phase transitions, dissipative structures, Synergetics and emergent computation (subsymbolic) as in Neural Networks and Cellular Automata. Other examples relate to the usage of precise mathematical properties, such as *non-linearity* and *isomorphism* in a metaphorical way with the purpose of making generic considerations sound scientific.

Systems societies often do not keep up with how *disciplinary research* is currently carried out. They assume that disciplines are those of von Bertalanffy's times, which, unfortunately, are still taught in schools.

Dealing with problems of systemics has often been a *way out* of avoiding disciplinary knowledge.

We believe that disciplinary knowledge is a necessary, although not sufficient condition for dealing with systemics.

So-called *reductionism*, the enemy *par excellence* of systems societies, is no longer an oversimplifying and thus ineffective approach based upon the assumption that the macroscopic level can be explained by the microscopic level and thus ignoring processes of *emergence*. Reductionism assumes the possibility of reducing problems of a specific discipline to those of another (not necessarily *simpler*, but at another level of description) such as reducing behaviour to synapses, psychology to neurology and life to molecular biology.

Usage of reductionism only is to be intended no longer as *incorrect conceptual formulation*, but rather as a problem of *ignorance*.

The crucial point is that systemic knowledge (necessary for dealing with processes of emergence) is not based on avoidance of knowledge at the level of partitions as assumed by the observer to study the system. On the contrary, a systemist should have competence at the different levels of description. Competence at the systemic level should not be an excuse for having no competence or no appreciation for the microscopic level.

By not dealing with new scientific, approaches and fundamental epistemological questions, systems societies have often become self-referential, without a cultural and scientific *identity* driving, at the best, towards a generic will to *collect* different approaches.

A robust *theoretical* and thus *general, trans-disciplinary* (i.e., systemic properties are considered *per se*, discipline *independent*) line of research in systemics may consist of dealing with the theoretical problems of *emergence* taking place in different disciplinary contexts. These considerations highlight how **systems societies are not the owners of Systemics, in a situation where systems research is mainly performed outside the traditional world of systemics and within interdisciplinary initiatives.**

In the literature there is a large number of papers and books, as well as conferences and workshops, all related to the activity of systems societies and often all *equivalent*, i.e., without introducing new, even controversial, paradigm shifts, new approaches and views. The systems community may be then considered as *conservative*, using and re-using stereotyped and never reviewed concepts such as “the whole is more than the sum of its parts”. This conservativeness contradicts the original purposes of the founders.

It is time for some fresh air.

On the other hand, there is a very large production of books and papers *outside* the range of influence of systems societies, with intensely innovative systemic content, in almost all disciplinary fields, using interdisciplinarity not as an ideological, pre-established approach, but because of the impossibility of avoiding the interdisciplinary representations of problems and the usage of models and simulations based on the concept of system. The level of complexity is such to call for an interdisciplinary, systemic approach.

The purpose of systems societies should be to *identify* and, where possible, produce contributions to systemics taking place in disciplinary and multidisciplinary research, making them general and producing proposals for structuring and generalizing disciplinary results. Examples of theoretical aspects of such an effort is that towards the establishment of a *General Theory of Emergence, a Theory of Generalization, Logical Philosophical* models related to Systemics and the issue of *Variety* in different disciplinary contexts.