

# *Preface*

Do we really need system theories? Their claim to be part of a universal science has evoked criticism: a 'theory of everything' has no real content and must of necessity be superficial. However, to be honest, the attempt to gain more abstract and general comprehension must sometimes be made at the expense of concrete and particular exposition. But it is also true that the most general theory, which explains the greatest range of phenomena, is the most powerful and the best; it can always be made specialized in order to deal with simple cases.

The more science becomes divided into specialized disciplines, the more important it becomes to find unifying principles. What we need to understand is not the behaviour of individual parts but rather their orchestration. Often, our goal must not be to understand what things are made of, but rather how they are compounded and work together in integrated wholes. We can call this systems science. This science looks for system properties applicable to all collection of parts, regardless of size or nature.

The why and how in defence of Systems Theory is presented in the following chapters. When applied sensibly, this theory will make us conscious of the far-reaching interconnections and complexity of our existence. It will show the consequences of adopting solutions that are too spontaneous and too simple and should help us to speak in terms that are understandable in fields as remote from each other as agriculture and astrophysics. Furthermore, it should be recalled that systems theory and its applications emerged out of a need to solve real world problems.

All who attempt to solve problems, make recommendations and predict the future, need theories, models and, as a starting point, concepts, which represent the backbone of the task. Theories introduce order and meaning to observations that may otherwise seem chaotic. Good theories should provide a simplified presentation of complex ideas by establishing connections between hitherto

unrelated phenomena. They enhance a growing understanding and help us to guide future research. Those searching for useful ideas among these pages must however realize that the benefit of a certain theory has nothing to do with whether it is 'true' or not — 'truth' is a quality that is undefinable. What we can define is usefulness in relation to our need; different needs obviously demand different theories.

The book is divided into two parts. The first is devoted to the historical background of the systems movement and presents pioneering thoughts and theories of the area. Basic concepts of general systems theory with well-known laws and principles are offered as well as related topics like cybernetics and information theory.

The second part deals with some of the common applications of systems theory within systems science like artificial intelligence, management information systems, informatics and some other associated topics. Finally, an attempt is made to predict the future of systems theory in a world apparently going to be at the same time both fragmented and integrated.

"In times of change, it is the learners who will inherit the earth, while the learned will find themselves beautifully equipped for a world that no longer exists".

Lars Skyttner  
University of Gavle, 2005