Preface

The Abisko workshops have been organised in the far north of Sweden since the beginning of the 1980s at a high international level. The common theme has been various aspects of complexity, implying that systems analysis issues in their many shapes often have been on the table. Sometimes there has been a focus on topics such as "mind and matter" or "man and the machine". Common for all these topics has been the broad interdisciplinary approach where we have wanted to illuminate the chosen issue from many angles. Several of the workshops have resulted in internationally recognised books on various topics.

The gathering of a set of renowned international scholars mixed with some hungry younger researchers at a remote place among the mountains in the wilderness of northern Sweden for a week has provided the possibility to probe further into issues of common concern, often with an interesting interdisciplinary blend of personalities. Normally, an Abisko workshop gather around 25 specially invited persons. The facilities provided by the scientific station at Abisko, owned by the Swedish Royal Academy of Sciences, provide a congenial setting in the wilderness for these events. This includes the (almost) midnight sun in the month of May when spring is just hanging in the air in this sub-arctic area. This sets a frame which encourages undisturbed intellectual dialogue.

In 1999, the topic of the Abisko Workshop was the emerging importance of the meso-scale in addressing issues of systems complexity. Here we concentrated on the scaling issue and put special emphasis on the level "in between", i e the "meso-scale" where the influences from the macro and from the micro meet. We discussed these problems from a variety of realms of scientific experiences devoted to understand complex phenomena, e.g. those related to different forms of hierarchisation.

We had a strong centre of gravity in biology, but did not exclude other

realms of expression like economics or physics. The reason to have biology as a major starting point was that many of the interesting topics we focused upon this time were so nicely illuminated by examples in the interface area of neural processes, population dynamics and general adaptive processes. The possibility to frame some of the problems of scale in mathematical language was also an interesting starting point and a challenge. It also meant that the workshop was not a meeting on theoretical biology, but used the knowledge in those domains as an important input to better understand the more general micro-meso-macro relational issues.

In the year 2000, we followed up on these concerns, by giving focus to the stability and instability of different systems and their capacities to "recover" after different forms of shock treatment. The workshop name was "Systems Shocks – Systems Resilience". We probed these destabilisation-recovery, or "resilience" properties, from many angles. The idea was to explore issues of resilience using examples from different kinds of systems. Examples of resilience phenomena may come from natural systems, such as various ecosystems. The interplay with societal phenomena introduces other aspects. Economical systems may also expose dynamic features of stability/instability including disruption and irreversibility. The same holds true for technical systems of different kinds. Our aim was to gather a sufficient number of cases in order to probe further the nature of fragility and plasticity of systems, especially facing changes due to pressures and shocks. In so doing, we looked at mathematical descriptions, as well as more qualitative features of these phenomena.

The structure of systems expressing their micro-macro features is closely connected to resilience issues. Our analysis of the vulnerability of systems to shocks, thus has provided a wide array of exemplifications.

We want to convey our warmest thanks to the participants of the two Abisko workshops in the years 1999 and 2000. We also owe thanks to the Abisko Scientific Research Station and to the Royal Swedish Academy of Sciences (KVA), which gave us the permission to use these excellent facilities in their wonderful natural setting. Furthermore, we thank Agora for Biosystems, an inter-disciplinary research centre under the auspices of KVA, which was involved in the organization of the two Abisko meetings that this book builds upon. Several persons should be recognized, in addition to the authors of this book, notably Per Aronsson, Gabriel Liljenström, and Berit Örnevall for their crucial assistance in making these workshops operational as well as laying the foundation for this publication. In this context, we are also grateful to Fredrik Snellman for the technical editing of the book.

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