

# Preface

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The aim for this book is to offer stimulus to those wishing to engage with the concepts and tools provided by the emerging paradigm of thought on complexity and at the same time to foster new debate on co-evolutionary issues within the social sciences. The book reflects the growing attraction for social scientists of investigations into the nature and evolution of complex dynamic processes, particularly as they affect human societies in a variety of environments, social, political and economic. More specifically, it identifies the need to move beyond the abstruseness of the current complexity discourse to explore real world applications through a set of empirical examples that demonstrate the connections between abstract issues that have received mainly formal mathematical treatment and the problems faced by decision makers in the contemporary world. The wide variety of representations and explorations presented here – from archaeology through urban evolution, from industrial decline to the dynamics of innovation – suggests potentially fruitful directions for future research into the evolutionary and often counterintuitive behaviour of socio-economic systems.

This book has its origins in the NEXSUS project, a Priority Network funded by the ESRC over a period of four years (2000–2004). The research concerned the broad application of complex systems thinking and approaches to increase understanding on the general theme of sustainability in socio-economic systems. At the core of NEXSUS were six research projects involving the participation of five UK universities (Cranfield, Manchester, Sheffield, UCL and Cambridge). While each project was designed to tackle a different issue, the aim was to try to create interdisciplinary bridges across these problems, leading to common understandings and integration in methodologies. Some of these commonalities are examined in the first introductory chapter and Afterword. In addition to these research aims, NEXSUS has developed a national and international network and fostered the Complexity Society to link a broad-based community of researchers and practitioners concerned with issues of sustainability of socio-economic systems, decision-making in uncertainty, adaptability, the development of networks and the application of evolutionary complex systems.

The contributors to the book show that complexity issues do not reside in some remote corner of science, accessible only to a limited group of

cognoscenti. Terms such as ‘self-organization’, ‘phase transitions’ and ‘path dependence’ have entered mainstream usage and the underlying principles involved are essentially simple, involving above all, a change in orientation from the reductionist and static to the systemic and dynamic. They can help generate tractable solutions to a variety of socio-economic questions. For these reasons the complexity perspective has important consequences for managers and policy makers in a variety of fields. But what the contributions also show is that there are no invariable sets of rules or short-cuts by which the human conundrums created by complex dynamic processes can be tackled. Each problem set must be addressed on its own merits and an appropriate methodology devised to which insight can be offered by the tools and conceptual orientation of the complexity perspective. Herein lies the contrast with the normative scientific approach that pursues universalist methods of analysis and interpretation. The complexity perspective acknowledges above all the importance of non-reductionist, pluralistic approaches to interpretation.

We would like to thank the volume authors not only for their cooperation in its making, but for fulfilling the cross-disciplinary aims of NEXSUS and producing thought-provoking contributions. We would also like to thank Simon Ford, the volume’s Editorial Associate, and Jane McCarthy and Rosemary Cockfield, who have provided invaluable coordination for the project. Professor Peter Allen was the inspiration for the research programme as a whole.

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