



Guest Editors' Introduction

The discipline of system dynamics was conceived, as is well known, by Professor Jay Forrester and his co-workers at the Massachusetts Institute of Technology in the late 1950s. Forrester's brilliant insight was to realise that the concepts of feedback control theory could, and should, be applied to policy design in all kinds of managed systems. His insight was made reality by the further recognition that the complexity of managed systems was too great for pure analytical methods. What was required, and what Forrester devised, was a unique combination of visual modelling, non-linear algebra and simulation, thus leading to a new discipline and to special computer languages such as DYNAMO as the practical and experimental foundation for the approach.

Since then, there have been extensive applications, numerous research publications, accumulation of academic dissertations and several textbooks. The inter-national System Dynamics Society was established in 1983 and a refereed journal, the *System Dynamics Review* was launched in 1985, building on the original journal, *Dynamica*.

Although system dynamics originated at MIT and still flourishes there, it has spread to many other universities world-wide. The UK has been no exception and the first academic group here was established by one of us (Geoff Coyle) in 1970 at the University of Bradford. The passage of about 25 years of UK effort in system dynamics seemed to call for a special edition of the *Journal of the Operational Research Society* to record a little of that history. But mainly it allowed us to reflect current work from UK practitioners and some continental Europeans. We were pleased to accept an invitation to edit the special issue.

Apart from celebrating the first 25 years of system dynamics in the UK we have sought to provide readers of this *Journal* with an up-to-date image of the field and its impact on policy, strategy and management education. We also wished to show a representative sample of contemporary applications and research. Finally, the special issue provides an opportunity to draw together the UK system dynamics community and to form a UK Chapter of the System Dynamics Society.

This special issue builds on and then extends Geoff Coyle's Silver Jubilee paper which appears immediately after this introduction. From this historical base the special

issue presents a series of articles that demonstrate where the field is now. Each article is written to highlight a positive and substantive project or initiative that also challenges (implicitly) misperceptions of the field. Although there is conceptual, theoretical and even philosophical content, the emphasis is plainly on practical applications that demonstrate theory in action.

In soliciting papers we aimed at four broad themes. The first theme surveys current educational programmes and professional infrastructure in the UK and continental Europe to indicate how the field has grown and matured. The second theme shows how system dynamics is capable of exploring a broad range of policy issues. Illustrative topics include corporate diversification, deregulation, health care and dynamic visioning. The third theme addresses the influence on decision makers of modelling and the modelling process. This theme recognises that a discipline aimed at policy design must be persuasive to those with the power to act and must enable them to develop their own insights and understandings. The fourth theme shows that system dynamics is a vibrant and developing field with its own methodological research topics. We approached this final theme by inviting papers at the leading edge of the field. Some of the ideas are controversial and remain to be tested. Some, indeed, diverge from the classical view of what system dynamics is and does.

From the outset of the project John Ranyard, the *JORS* editor, has strongly supported our desire to seek from authors practical examples and real-world applications of system dynamics. The result from the demanding peer review and editing process is, we believe, a high-quality publication, thought provoking for academics yet pragmatic enough to stir the imagination of practitioners.

We are grateful to the authors and referees who have laboured hard under considerable time pressure to produce this special edition. We believe that they have produced a valuable contribution to the field which will help to make system dynamics accessible to the wider OR community. The project could not have been completed without the endlessly helpful and professional administrative support of the OR Society and Christine Faulkner in particular.

RG Coyle and JDW Morecroft