

Editorial 19.2

Facts and Fancies: Can we do better in the future?

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Several of the papers featured in this issue concern the questions of how to think, to plan and to act in a complex world in which uncertainty abounds. This is something that the modern world still has difficulty in accepting. For many, the advance of science implies that we can expect to know the future more and more clearly, and therefore make better and better strategic decisions. But, for those of us working in the world of complexity science, this is in fact a mistaken belief, because we now know that complex systems evolve over time both quantitatively and qualitatively. The latter events imply that new 'dimensions' of the situation get turned on and there will be emergent characteristics, problems, mechanisms and issues during such 'instabilities'. And even what we consider to be a problem or a success may change. Not only that, but the levers and impacts of decisions and plans already made may have unexpected consequences and implications for the future. Our difficulty in accepting the potential 'openness' of the evolution of our system and situation comes from the seeming success of science itself. But this success has mostly concerned our scientific knowledge of closed physical systems.

Increased knowledge has been the basis of our actions and decisions, and Science has been the basis of knowledge for several centuries. For physical objects, we can do 'repeatable experiments' and thus keep checking that the 'laws' we thought existed are still valid. In other words, 'knowledge' is really based on the regularities and responses that we have found to exist previously. Not only that but we have been able to weave a whole series of natural laws which fit together from the microscopic to the macroscopic and which give us confidence in the overall conception and laws of the physical universe.

But despite our fervent wishes to extend these principles to 'living' and more particularly to 'human', systems, we find that we are not at all in the same situation. Can there ever be a real 'science' of social systems, for example? Popper describes science in terms of a process of falsification of theories by experiment. In other words, theories and ideas are put forward and 'tested' through experiments. Those ideas that have not yet been proven false provide the current scientific explanations. But of course, those that are not yet proven false, may still not be true. Scientists would say that our current scientific views are those that have not been falsified by any experiment so far. But we are always ready to accept that they might be, if some new experiment were proposed. And here, we come to the issue of 'repeatable' experiments. If I can devise an experiment, get a result and then telephone to others round the globe asking them to repeat my experiment, this provides a check on the original result. If there is agreement, then we may say that, for the time being, this result is believable. But this would imply that we had an identical problem and situation being tested, with internal and systemic elements which are the same as in the original case. Knowledge must be based on shared, reproducible results from a series of tests, and this is manageable for physical systems. Although all scientists would be happy to accept that current knowledge is temporary, and could be potentially reversed in some new experiment.

But in social science and biological experiments it is much more difficult to define 'repeatable' experiments, because individuals differ in their genetic makeup, in their cultural backgrounds and in their experiences so far. This means that the underlying elements of any experiment (soils, plants, insects, animals, people, culture and history) could possibly vary for different experiments. These are not strictly 'repeatable' experiments, and therefore the knowledge arising from them is not at all as 'solid' as for closed, physical systems.

As is pointed out in several of the articles in this issue, although we increasingly expect leadership and management to base themselves on knowledge, we cannot necessarily assume that the level of ignorance or of non-knowledge may remain unchanged. What you do know may be good for current operations and profit, but it is perhaps what you don't know that will get you! Managerial self-limitation may be crucial in the development of a 'management of non-knowledge' to complement evidence based management. Another of the articles here, looks at the experience of the Korean Government in using the future to motivate changes in the present. However, because changes actually occur that were not part of the future visions, over time it is clear that at the frontier of socioeconomic change, there is great uncertainty. It is therefore important to bring complexity and emergence thinking into the 'strategic foresight' processes and consider the identification of new opportunities in the present. South Korea has now 'caught up' with existing ideas and knowledge and therefore can no longer rely on catch-up and benchmarking for their vision. It now needs to focus on complex, emergent systems that are rich in unforeseeable novelty, making imaginative connections and possible issues and outcomes as a basis for potential actions. In other words, it is important to develop and use complex systems thinking to help better imagine possible futures and strategic plans for these.

Another paper looks at how Teams within social and organizational frameworks operate, embedded in hierarchical and knowledge networks, with the aim of accomplishing a common task. Social interactions are the means through which team members exert their mutual social influence, change opinions, and converge to a common understanding. Broad simulation analysis is made in environments characterized by different levels of uncertainty. The simulation results allow the identification

of the best organizational structure that should be adopted to improve the consensus outcome.

Clearly, the emergence of complexity science itself provides us with a new understanding of the real 'limits to knowledge' that we (at last) know we face. Because of constantly evolving internal structures, interacting learning elements, and systemic structures, we now see that we cannot easily claim provable, repeatable experiments for social and even biological systems. Hence our likelihood of anticipating what the future will turn out to be, is much smaller than we thought. We must think of people having 'beliefs' rather than 'knowledge' and for social science to be a much more tentative than for simple physical science. In making decisions about future plans, decisions and actions we need to have a much more plastic and imaginative view of what might happen. Emergence, structural change and evolving morphologies mean that new issues, opportunities and possibilities can arise, and we need more imaginative complex systems models to help us escape the confines of the past. A model based on previous trends and changes will lead inevitably to creating plans and actions that are mere extrapolations of the past. The current interest in 'big data' modelling, can be very informative, but the information needs to be used within an 'imaginative' future oriented model, where possible structural and morphological 'instabilities' could be explored.