

Preface

*This is, therefore, the intensest rendezvous.
It is in that thought that we collect ourselves,
Out of all the indifferences, into one thing:*

*Within a single thing, a single shawl
Wrapped tight round us, since we are poor; a warmth,
A light, a power, the miraculous influence.*

*Here now, we forget each other and ourselves.
We feel the obscurity of an order, a whole. . .*

Wallace Stevens, 1950, Final Soliloquy of the Interior Paramour

Within the past decade we have seen on the one hand the majority of the world's population come to reside in urban areas for the first time in world history, while on the other we have seen a dramatic rise in average global temperature widely thought to be mostly due to the economic activities humans carry out in those urban areas. Nonlinear complex dynamics are profoundly involved in both of these related developments. This book will open with considering the historical forces behind this rise of cities, including some critiques of certain recent ideas of "new economic geography," and will conclude (except for a mathematical appendix) with a consideration of the science and economics of global warming and how to deal with it in the face of the uncertainties arising from these nonlinear complex dynamics, which will reflect the unique perspective of this author having been involved with climatological research for more than 35 years. In between there will be discussions of broader regional economic dynamics, the foundations of evolutionary theory, and the dynamics of ecologic-economic systems. A deep theme is that in all of these areas, nonlinear complex dynamics can result in discontinuities, such as sudden changes of urban growth patterns or the sudden crashes of biological populations harvested by human beings. These discontinuities can appear with little warning and can serve as the basis for the theories of unexpected events such as "black swans" as proposed by Nassim Taleb (2010).

This book has been many years in the writing, having been contracted for originally over a decade ago by Kluwer, which was bought out some years later by Springer, who is publishing it now. It was originally supposed to be the second volume of the second edition of my 1991 book, *From Catastrophe to Chaos: A General*

Theory of Economic Discontinuities, published by Kluwer. That book was rejected by 13 publishers before Zack Rolnick at Kluwer took it up, after which it did quite well for such a monograph, leading to the contract for a second edition. Originally written as a critique of standard economic theory, after it came out it came to be viewed by many as a kind of reference work for nonlinear dynamics in economics. It was with this in mind that it was decided to break up the second edition into three volumes, given that I was thinking in such terms. It was in this vein that the first volume of the second edition was written and published in 2000 by Kluwer, expanding on the material in the first eight chapters of the first edition. I wrote the Preface for that book on September 9, 1999, exactly 11 years ago from my writing this Preface on September 9, 2010.

As it is, this book does fulfill in many ways the original intention of being that second volume, expanding on Chapters 9–14 of the 1991 book, which in fact are reproduced essentially directly in this book as, respectively, Chapters 1, 3, 4, 6, 8, and 10. In turn, the final chapter, Appendix A, which serves as a Mathematical Appendix here, is the second chapter from the first volume of the second edition from 2000. The remaining chapters are brand new, with each generally expanding on the chapter that precedes it.

Despite this, for various reasons this book does not carry the originally planned title. This is really a result of how long it has taken me to complete it, having gotten distracted by other projects and responsibilities during most of the past decade. One reason is that there has been such an explosion of literature in the areas of interest of this book that making this a reference book for all this has simply become undoable, at least as originally envisioned. Thus, the topics of urban-regional and evolutionary-ecological economic systems have been approached by focusing more on specific matters of particular interest in connection with the deeper themes of the original book, without attempting to be fully comprehensive.

There is also the matter that most economists now understand much better and are more open to the nonlinear complex dynamics mathematics that was the focus of the 1991 and 2000 books. Thus, there is less need to emphasize in this book an exposition of the mathematical techniques involved. This reinforces the idea of shifting more to focus on the issues of the topics themselves, even as nonlinear and complex dynamics continue to be an ongoing theme, including the original focus on discontinuities in economic systems. In any case, the relegation of the purely mathematical chapter to an appendix at the end symbolizes this shift, which fits with the change of title for this book.

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I dedicate this book to my three lovely and loving daughters: Meagan, Caitlin, and Sasha. More than any other book I have written, this one is concerned with the future, their future, and that of their children and their childrens' children, on and on, hopefully.

Harrisonburg, VA
9/9/10

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