Emergence: Contemporary Readings in Philosophy and Science (MIT Press)

From A Bradford Book
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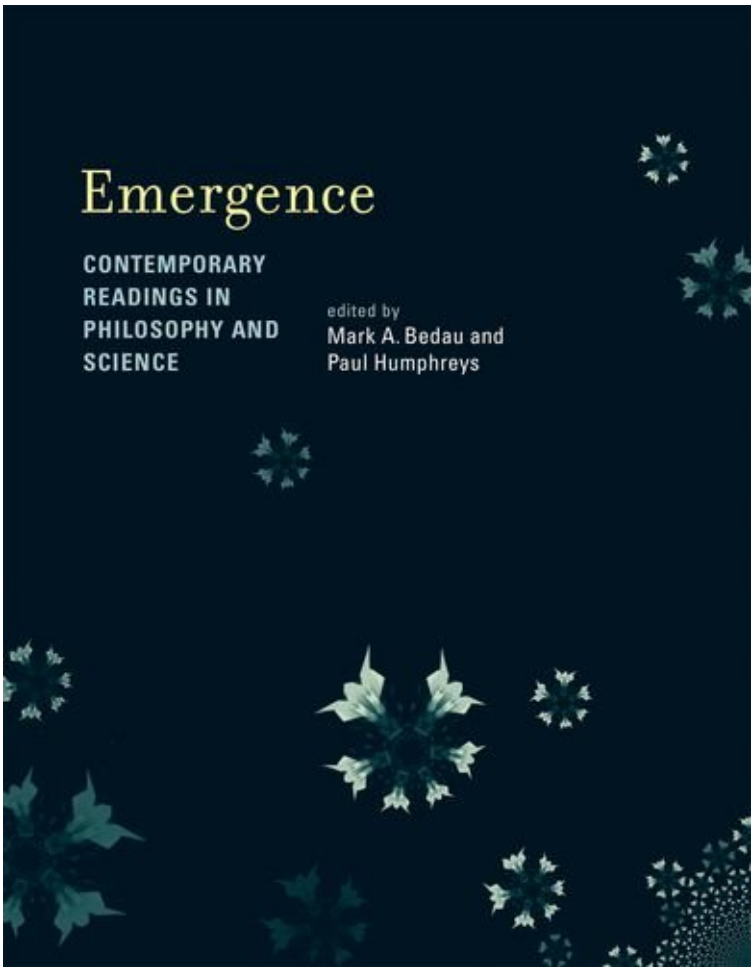

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From A Bradford Book : Emergence: Contemporary Readings in Philosophy and Science (MIT Press) before purchasing it in order to gage whether or not it would be worth my time, and all praised Emergence: Contemporary Readings in Philosophy and Science (MIT Press):

2 of 2 people found the following review helpful. Emergence everywhere and hardly knowableBy Edward BrynesThis book is an anthology of papers on emergence and reduction as the terms are understood in the philosophy of science. Emergentism is a doctrine that began in Victorian England and reached its mature stage in the 1920's. It was an attempt to explain the hierarchy of sciences from physics (the most basic, concerned only with matter and energy) to chemistry, to biology, to psychology (most complex). Considering this great ladder of theories, laws, entities and concepts, emergentists noticed certain stages of discontinuity, where they encountered entities that seemed quite surprising in terms of anything seen at lower levels. A simple example was the periodic table in chemistry. Elementary

students noticed that there was nothing like it in the more basic science (physics) they knew. So here was emergence of chemistry from physics. As they learned more and more science, especially atomic physics, they saw that the regularity in the periodic table was a natural consequence of the gradual filling-in of the vacant spots in the outer shell of electrons in the atom. So now the periodic table, which seemed to be a surprise of chemistry, was accounted for in terms of the more basic science, physics. We don't even need to talk about the periodic table any more. This is an example of reduction,-- in the sense that chemistry has been reduced to physics.Emergentism has gone through a period of death and rebirth. In the nineteenth century, science was advancing rapidly but there were many gaps in knowledge; often scientists did not even know the gaps existed. John Stuart Mill, founder of the doctrine, and his successors postulated substances, forces, and laws that existed only at higher levels. Here was the origin of doctrines like vitalism. By the 1920's the existence of the new entities was beginning to look doubtful; then quantum mechanics came along and explained chemical bonding. Instead of chemistry discovering new entities, physics succeeded in explaining chemistry with its own entities. (The story is well told in the opening essay by Brian McLaughlin.) Even the discovery of DNA did not involve any of the vital forces or elements that emergence postulated, which had to give way to reduction -- the supposed "higher" chemistry being supplanted by (i.e. reduced to) the more basic physics.This book elaborates mainly on the first of these complementary concepts from an abstract viewpoint. At the top of the hierarchy, emergentism retains its plausibility because of our ignorance. There is no reductive explanation for human consciousness, which as far as we can see will remain far apart from the chemical and physiological processes in the brain. (This is the idea behind "Reductionism and the Irreducibility of Consciousness" by John Searle.) There is an alternative concept to reduction, supervenience, which postulates that any change in mental processes must be reflected in a physical change, but the authors do not spell it out with much concreteness. In general the authors attempt to create a greater degree of unity in the sciences by looking for instances where valid generalizations about higher level phenomena, involving human beings, can be reduced to lower-level generalizations about the inanimate world of biochemical processes and atomic particles.Emergentism as a research field recovered after World War II. An essay by Herbert Simon, "Alternative Views of Complexity", claims that the resurgence of interest reflected the much greater complexity of the technical systems developed during World War II. Rather than look for laws involved in emergence, researchers made use of computers to simulate various natural processes occurring in populations. Changes and stresses of a real situation are represented by the computer's random number generator. Some of these simulations are reprinted here. The most interesting to me was Thomas Schelling's "Sorting and Matching: Race and Sex", showing how small racial differences in residential preference can lead to the emergence of large and unpredictable changes in the composition of neighborhoods. An even more interesting example is biological evolution itself. The fact that there is a long-run tendency for more and more complex organisms to emerge as a result of random change suggests an overriding (perhaps divine) purpose, which D. C . Dennett has called "Darwin's Dangerous Idea." There is an essay of his on the detection of patterns.The diverse collection of various kinds of technical subject matter and abstract philosophic concepts makes this a difficult book, but the subject itself is fascinating..

Emergence, largely ignored just thirty years ago, has become one of the liveliest areas of research in both philosophy and science. Fueled by advances in complexity theory, artificial life, physics, psychology, sociology, and biology and by the parallel development of new conceptual tools in philosophy, the idea of emergence offers a way to understand a wide variety of complex phenomena in ways that are intriguingly different from more traditional approaches. This reader collects for the first time in one easily accessible place classic writings on emergence from contemporary philosophy and science. The chapters, by such prominent scholars as John Searle, Stephen Weinberg, William Wimsatt, Thomas Schelling, Jaegwon Kim, Robert Laughlin, Daniel Dennett, Herbert Simon, Stephen Wolfram, Jerry Fodor, Philip Anderson, and David Chalmers, cover the major approaches to emergence. Each of the three sections ("Philosophical Perspectives," "Scientific Perspectives," and "Background and Polemics") begins with an introduction putting the chapters into context and posing key questions for further exploration. A bibliography lists more specialized material, and an associated website (http://mitpress.mit.edu/emergence) links to downloadable software and to other sites and publications about emergence.ContributorsP. W. Anderson, Andrew Assad, Nils A. Baas, Mark A. Bedau, Mathieu S. Capcarrre, David Chalmers, James P. Crutchfield, Daniel C. Dennett, J. Doyne Farmer, Jerry Fodor, Carl Hempel, Paul Humphreys, Jaegwon Kim, Robert B. Laughlin, Bernd Mayer, Brian P. McLaughlin, Ernest Nagel, Martin Nillson, Paul Oppenheim, Norman H. Packard, David Pines, Steen Rasmussen, Edmund M. A. Ronald, Thomas Schelling, John Searle, Robert S. Shaw, Herbert Simon, Moshe Sipper, Stephen Weinberg, William Wimsatt, and Stephen Wolfram.

Emergence is a topic that is multi-faceted and controversial, both in science and philosophy. To help one get to grips with the various issues, this selection of some of the most important articles written in the last few decades is invaluable: not least through the editors' introductions to the book's different parts, and their annotated bibliography. (Jeremy Butterfield, Senior Research Fellow, Trinity College, University of Cambridge)This is a very good and useful book -- as more and more scientists push toward the meanings of life and of mind they will appreciate the articles

presented here, and the introductory material that helps put them into context. (Charles Taylor, Ecology Evolutionary Biology, UCLA) Emergence is paradoxically the most important, yet least understood notion in the sciences of complexity. This book is an excellent collection of the best recent philosophical and scientific thinking on this tantalizing and elusive topic. A must-read for anyone interested in how modern science can and must go beyond reductionism. (Melanie Mitchell, Department of Computer Science, Portland State University)About the AuthorPaul Humphreys is Professor of Philosophy at the University of Virginia.