Essays on Complexity:

1. Life and Humanity

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Introduction: The goal of this book

The understanding of complex interactions and complex behaviors will surely be a dominant theme in the science of the coming century; and inputs from many different sciences are likely to be needed as such studies develop. As just one illustration of this, consider some of the most fundamental problems of human biology: How does the human genome encode directions for building and operating a body? How is the correct folding of proteins managed? How are sensory inputs processed and filtered so as to become intelligible to the brain? How are memories and thought processes encoded? Such questions involve understanding on the molecular level, where considerations of information, entropy, and energy within a quantum mechanical framework probably play an important role. In seeking answers, biologists will surely need help from many other sciences, such as chemistry, physics, mathematics, and computer science.

This book, and its companion volume "Essays on Complexity: the Mathematical Sciences" make no attempt to attack such basic problems; they have a much more modest aim. The goal was to play a small part in encouraging cooperation between the sciences by presenting a broad survey of a number of different ideas and ways of thinking, centering around different forms and concepts of "complexity". Far too many of us are trained in just one field, and have a great deal of difficulty in understanding scientists in other areas.

* * * to be continued * * *