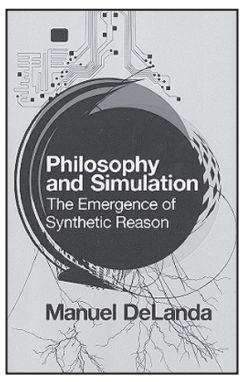
Reviews



Philosophy and Simulation: The Emergence of Synthetic Reason
Manuel DeLanda, Continuum, 2011, 226 pp.
Reviewed by Heather Davis

What causes newness in the world? How do things emerge that weren't there before? How, for example, can the combination of oxygen and hydrogen produce the quality of wetness when neither of these gases is wet in and of itself? In his new book, *Philosophy and Simulation: The Emergence of Synthetic Reason*, Manuel DeLanda sets himself the task of providing a philosophical account of this fundamental problem by providing a theoretical foundation for emergence. He begins by contrasting the physical properties of atoms that collide with and build upon one another without changing states with the emergent qualities of a chemical reaction, where the interaction of two different molecules produces properties that neither originally possessed. This difference provides a basis for a detailed account of emergence itself.

The epistemology of the concept of emergence has undergone a radical historical shift over the twentieth century, but DeLanda insists that it is more important to consider the ontological status of emergence, because it is always fundamentally irreducible; it cannot simply be broken down into component parts, but rather irrupts into the world. This irreducibility, he contends, leads to an immanent materialism where objects are composed of what he terms "universal singularities." Computer simulations provide for him both the testing ground for the emergence of biological and social categories, as well as a case study for emergence itself.

What is most fascinating about the book is the way in which it is written, its form reflecting its content through increasing layers of complexity. DeLanda begins with the basic components of the physical world and then moves through the various stages of evolutionary development: from the appearance of polymers, RNA molecules, bacteria and other simple organisms, to subjective gradients of multicellular organisms, memory and significance in mammals, to primates' complex social structures manifested in tools and manual operations, and finally to language and power in hierarchically stratified societies. With each of these movements, he pairs increasingly complex computer systems as both tools of analysis and as systems that simulate the various scales of emergence. DeLanda moves from cellular automata and genetic algorithms to multi-agent systems, using computer programs that in their increased complexity mirror the chemical and biological evolutionary processes they are designed to research.

The insight and strength of the book lie in its strange intermingling of methodological analysis and a rigorous examination of the concept of emergence. As the book progresses, the increasingly complex individuals (any singular bounded entity, from an atom to an institutional organization, that can be delimited through its particular historical, material and/or social context) are never represented as totalities. Rather, the idea of an assemblage (as developed in DeLanda's other books, specifically *A New Philosophy of Society: Assemblage Theory and Social Complexity*) reflects the way in which these wholes retain both irreducibility and decomposability. He writes, "emergent entities at one scale can be used to compose emergent entities at a larger scale,"[1] but each of these entities is itself irreducible, bringing into existence that which was only virtually contained within the field of possible structures. Significantly, DeLanda performs this argument in the form of the book even as he analyzes the quality of emergence and simulation as its content.

Philosophy and Simulation provides a sustained argument for the objective existence of diagrams of assemblages, as expressed through computer programming and simulation. What will be most interesting to readers whose interests lie outside the domain of computer studies is the way in which these programs reveal an "intimate link between ontology and epistemology." This insight is perhaps the most profound argument for the justification of computer simulation beyond its practical use as prediction models for understanding evolutionary systems (from biological organisms to the development of social systems). The simulations themselves are not representations of that which they simulate; rather, they create their own space of emergence in an act parallel to evolutionary processes. They also act as guides to help us distinguish between what is non-emergent, or rule-based, and that which emerges from the structure of a "possibility space." It is the overlap between the biological world and the mathematically produced possibility spaces that enable simulations to be useful, not because of their direct correspondence, but because mathematical models have the ability to mimic the behaviour of a process within a certain range of values. As DeLanda states, "the computer simulations discussed throughout this book are emergent wholes composed of information existing above the computer hardware that provides their material and energetic substratum."[2] The simulation models examined in the book are layered together to create a relation of part to whole that is also the argument for the book itself.

The synthesis between these two subjects is indeed fascinating, but DeLanda chooses to cleave apart the biological and computational, dividing each chapter into these two components. By doing this he makes the work quite technically specific—more general philosophic implications and conclusions are taken up at length only in the Introduction and Appendix. These chapters serve as a field guide to the broader claims of the book, where each chapter then looks in detail at a particular program and particular category of emergence. DeLanda states that computer "simulations can play the role of laboratory experiments in the study of emergence complementing the role of mathematics in deciphering the structure of possibility spaces. And philosophy can be the mechanism through which these insights can be synthesized into an emergent materialist world view that finally does justice to the creative powers of matter and energy."[3] However, this mutual influence is primarily expressed through the overall form of the book rather than in the content of its individual chapters. The balance of the book is taken up with the material emergence of simulation programs. While this provides considerable detail and a strong theoretical foundation for the argument that diagrams actually exist, it will be most useful to readers who have a specific interest in these computer programs. ×

Notes

1. Manuel De Landa, *Philosophy and Simulation: The Emergence of Synthetic* Reason (London: Continuum, 2011), 23.
2. Ibid., 201.
3. Ibid., 6.

Heather Davis is a researcher and writer from Montreal. She recently completed her PhD in Communication at Concordia University on the political potential of community-based art. She explores and participates in expanded art practices that bring together researchers, activists, and community members to enact social change. In the fall, she will begin a postdoctoral fellowship at Duke University to examine the shifting nature of art institutions under the double pressures of social art practice and neoliberalism.