Henry Plotkin
Evolutionary Worlds without End.
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Plotkin's synthesis is a gem of a book, but a flawed gem. His vision of how evolutionary theory promises to serve as the general explanatory theory for all biological phenomena—from organisms, through culture, all the way to science—at times induces vertigo with its depth of vision. Yet, problems—both avoidable and unavoidable—detract from the overall impact the book has upon the reader.

Plotkin's aim is truly grand. He compares the theory of evolution to the synthesising power of physics, and does not find it wanting. The thought, of course, is a common one among those who have sought over the last few decades to apply evolutionary theory to social phenomena, among many other things. Plotkin moves beyond programme-setting platitudes, however, and tries to spell out precisely what it is that this multidisciplinary fundament must include. Most important, he believes, is the theory of selection, which serves to explain adaptation without the need for any intentional design—a point whose significance Plotkin points out not just in the case of animal and plant life, but also in the case of human-made institutions. Plotkin argues that this must be supplemented, at the very least, with proper appreciation of the two-way pull between organism and environment that the recently-developed theory of niche-construction provides an account of, with cultural examples such as language again playing a major role. Finally, Plotkin adds the need for an account of the hierarchical organization of biological systems, with theories of multi-level selection and of major transitions serving to fill this need. According to these theories, human society or culture in all its complexity sits somewhat precariously atop all the other levels in the big picture.

Plotkin is well aware that the story he is spelling out is far from set in stone. In many places he draws attention to the lack of concrete evidence for even vital details of his story. In other places, it is evident that he, himself, is not altogether certain of the way forward and is testing the ground. But such is the experience of exploration: a long struggle through trackless rough country can as often lead to a dead-end as to a breathtaking vista. It is a testament to Plotkin's skill and knowledge that he so often guides us to worthy insights. Both in terms of the ideas scattered throughout the book and in terms of the overall approach, this is a work that richly rewards the reader. Anyone pursuing the same general agenda as Plotkin—which this reviewer unashamedly shares—will find much here that will help in developing their own thoughts on the subject. Plotkin has made an effort, in fact, to make the book approachable to a more general audience. Yet, I think that the territory covered may be too challenging for any but the most determined of neophyte readers, as Plotkin has not quite had the patience to lead

his audience through the many difficult stretches of his book, making some prior familiarity with the lay of the land necessary. However, there are difficulties with the book that don't necessarily stem from its path-blazing character.

A most surprising problem is the number of minor spelling errors that seem to pop up every other page or so. One would not expect that from a publisher like OUP. Unfortunately, the effect is quite disturbing when reading what is already a difficult text. Indeed, in a number of places, the result is that the same phrase must be read several times in order to discern the intended meaning. The need for some extra attention from the editor is underscored by the more significant problem that the line of argument that Plotkin is pursuing is all too often lost in the undergrowth of words and examples, interesting though they may be. In exploring the exuberant diversity provided by the study of biology taken in the broadest sense, it is all too easy to wander. Indeed, Plotkin would have done both the reader and the topic an injustice if he did not display some of that diversity. Because of that, however, the book would have benefited from a greater than usual amount of sign-posting. Its absence here leaves the reader suspecting that the guide, himself, may be 'momentarily geographically embarrassed' at times.

Beyond such problems of exposition lies what seems to be a most enigmatic lacuna in the book. In many places Plotkin makes clear the degree to which his own thinking has been shaped by the work of Donald Campbell and Herbert Simon. To those who are familiar with the work of those two twentieth-century polymaths, this is highly commendable. Campbell and Simon managed to sketch some of the fundamental issues relevant to extending the evolutionary paradigm to social phenomena at a time when few others were even considering the possibility. All too few of those who have followed have had the ability to make adequate use of the paths blazed by Campbell and Simon. Yet, Plotkin is far from alone in trying to do so. The enigma is that he almost completely fails to draw upon the work of the others who in following Campbell and Simon are, one would think, closest to his approach. Indeed, apart from mention of Gerd Gigerenzer, it would seem that he is either unaware or dismissive of this work. Either possibility is shocking when, for example, one considers that Simon's research on the organization of complex systems has been greatly extended by Bill Wimsatt, whose *Re-engineering Philosophy for Limited Beings* would greatly assist Plotkin in his discussion of the hierarchies of biological systems. Even more surprising in this context is Plotkin's decision to rely upon Searle's anodyne account of function, which runs counter to the whole tenor of Plotkin's work due to Searle's subordination of it to the 'uniquely human property of intentionality'. Plotkin could have made use of any of a number of accounts that trace the roots of function, and intentionality, to general biological and evolutionary considerations and which, thereby, much better suit his overall approach. Just one such account is provided by Mark Bickhard, who was a long-term collaborator of none other than Donald Campbell.

For those who are interested in extending evolutionary explanations to a very

broad range of phenomena that include human culture, these are very exciting days. We are seeing a flood of fascinating experimental results as well as rapid development in the underpinning theories. One could well say that we are witnessing a major transition in how humanity understands the world and itself. Plotkin's book could be a significant part of this process. Yet, when the history of these times is written, this book will most almost definitely appear as a Tiktaalik—a transitional species that showed much promise but which was not the ultimate ancestor of the various forms that will come to dominate the new intellectual terrain.

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