Computer Simulations of Evolution

A number of computer simulations have been developed that demonstrate the need for intelligent agents to provide the kind of complex specified information that biological systems require. These simulations have been described and analyzed in places like here, here and here.

One of the most well-known evolutionary simulations is the Weasel Program, introduced by Richard Dawkins in his book "The Blind Watchmaker". Dawkins developed the Weasel Program in an attempt to provide evidence for Darwinian evolution, but ironically, the program instead provides support for Intelligent Design. The program shows how the phrase "ME THINKS IT IS LIKE A WEASEL" can be constructed by a process that randomly selects letters in each position of the phrase, and then selects and keeps those letters that fit correctly in each position. Although the program does work, it works only because information has been supplied to it that directs it toward its goal. At each stage in its process, this information is used to decide whether to keep or discard the letters it has chosen. Since the information specifies in advance the ultimate goal, this process does not simulate what Darwinian evolution theorizes. In Darwinian evolution, at each step in the process, natural selection favors a change that is beneficial to the organism at that step. At each Darwinian step, the ultimate goal is unknown.

Another limitation of the Weasel Program is that it is informationally sterile. That is, the information it contains leads inexorably to only a single result. The only way for it to provide a diverse set of outcomes would be to provide it with more information about more types of phrases. But the input of added information requires some form of intelligence, and could never be accomplished with an undirected process. See here for a more in-depth discussion on this.

Other computer simulations of the evolutionary process include Avida by Richard Lenski, and ev by Thomas Schneider. Both simulations purport to show how complex specified information can be generated via random search processes. However, in both cases, the specified information is obtained by knowing the final targets, and by providing active information to the process to move the search closer to the target. So in essence, they are both similar but more complicated versions of Dawkin's Weasel Program. Again, see here for a more in-depth discussion on Avida and ev. See here for an even more technical analysis of Avida, ev, and other evolutionary simulation models.

What about genetic algorithms, which use Darwin's process of incremental change and natural selection to solve mathematical search problems? These

algorithms have been found to work successfully on simple problems with gentle search space landscapes, and on problems where active information can be applied to the search process. They do not work well on complex problems with rugged, highly non-linear search spaces, especially when information is not available to the process on how to direct the search to its final target. Now the search for biologically functional proteins has one of the most complex and difficult search space landscapes. And the search space for integrated protein complexes and machines is even more complicated by several orders of magnitude. And, as we mentioned above, undirected natural selection works only when it finds an advantage at each step of the search process. The final result is never known beforehand. Thus if genetic algorithms are considered as simulations of biological evolutionary processes, they actually serve to falsify the assertion that the Darwinian process can successfully find any functional information for any biological system.