Review of: "Self-Replication, Spontaneous Mutations, and Exponential Genetic Drift in Neural Cellular Automata"

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This is an exciting and topically interesting question posed in a model system that raises solutions to the central problems of genetic drift in evolving live organisms.

Since the books published by C. Waddington up until his passing in the early 2000's, many have doubted his views that genetic drift leads seamlessly on to adaptations that have catered for the enormous variety both of species and strains within species. Brian Goodwin, his brilliant PhD student, carried these theoretical ideas forward, both on a mathematical modelling basis and by demonstrating, in strictly controlled experiments that function stems from and is perfected by adaptive forces over generations, e.g., even in many unicellular eukaryotes and in the patterning of higher orders of animals like the stripes in zebras and skin patches in leopards.

I remember BG lectures where he stressed that the emphasis on the rules and sequences of the nucleic acids goes a bridge too far, and that in the presence of physical forces both chemical and electrical, the maintenance and inheritance of form does not require special machinery but comes as easy as 'falling off a log'!

This proposal takes these themes to a higher level and is well in the tradition of several pioneers of theoretical biology. It is well written in straightforward language and with helpful diagrams.