Process and Product Concepts of Natural Selection and Genetic Drift

Charles Pence*[1]

[1]University of Notre Dame, Program in History and Philosophy of Science – 453 Geddes Hall Notre Dame, IN 46556, United States

Abstract

Are natural selection and genetic drift best thought of as processes, as products, or as some hybrid of the two? While this is a well-known issue in the interpretation of evolutionary theory, it has seemed in the last several decades to have both made relatively little progress and not often enough connected to actual biological examples. In this paper, I lay out this problem, diagnose the reasons that it might have been difficult to resolve, and indicate the direction in which I believe a solution can be found. Of course, since process and product notions of selection and drift are intended to be definitions of the same concept, their extensions – the individual biological instances that they mark out as selection and drift – will be nearly identical. But their intensions – the conceptual structures that they propose for evolutionary theory – are quite different. The fact that this stark choice between interpretive frameworks in evolutionary theory is not mirrored by equally stark consequences for our classification of biological cases, I claim, can help explain why this debate has been intractable. How, then, should we expect to move forward? While the extensions of these differing concepts are nearly identical, they are not *precisely* identical, and it is here that we can make progress. There do exist (even plausibly empirically relevant) biological cases that these definitions of selection and drift classify differently, and it is here that we can hope to determine which of these conceptual frameworks is correct. I close by laying out a few examples and offering some indications for future research.

*Speaker