
Microevolution on microscales: shifting views of the temporal and spatial scales of evolution in British genecology

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Abstract

Session: **A comparative history of evolutionary theories in the mid 20th century**

Among plant ecologists interested in intraspecific variation – especially those involved in the interdisciplinary field of experimental taxonomy, or genecology – working in Britain in the decades following WWII, the answers to two closely related questions were in flux: First, on how small of a spatial scale can populations of organisms diverge in their evolutionary trajectories, becoming adapted by natural selection to their local environments? And second, just how rapidly can such adaptive evolution occur? By the middle of the 1960s, many ecologists had come to believe that adaptive evolution could occur on temporal and spatial scales commensurate with ecological processes such as succession. This conceptual shift has been implicated as a central factor in the emergence of the field of evolutionary population ecology in the 1960s.

So what accounts for this shift in thinking about the temporal and spatial scales on which divergence and adaptive evolution can occur, and what were the consequences? I will use the ideas and research activities of plant ecologist Anthony David Bradshaw (1926 - 2008) during the 1940s- 1960s as a lens into the shifting conceptual and methodological framework of post-war British experimental taxonomy (or genecology). Drawing on archival sources, I will describe how Bradshaw's ideas about the temporal and spatial scales of adaptive evolution changed, enabling a reconceptualization of the evolutionary significance of phenotypic plasticity (the ability of individual organisms to respond morphologically, physiologically, or behaviorally to changes in environment). Using methods from digital and computational HPS, I will situate Bradshaw within the shifting landscape of British agricultural research, and consider what this might imply about the complex relationships between agriculture, ecology, and evolutionary theory in Britain in the middle of the 20th century.

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