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# Going Molecular in Evolutionary Biology: techniques, objects, concepts and theories between 1960 and 1970.

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## Abstract

This paper belongs to the Session On the Expansion of the Modern Synthesis, organized by Richard Burian and David Depew. Participants include John Beatty, Jean Gayon, Richard Burian, Frank Cezilly and David Depew.

In this talk, I review the impact of molecularization on evolutionary biology, emphasizing the wider context of the Cold War era. For this purpose I distinguish between the context relevant to *theoretical* discussions in evolutionary biology after the 1950s and the material and technical context relevant to the molecularization of evolutionary biology. John Beatty (1987) has focused on the first of these, locating the classical-balance debate in the context of political debates about the effect of radiation caused by atomic testing in the late 1950s and early 1960s. Here, I open a different window on the Cold War context.

The Neutral Theory of Molecular Evolution (NTME) was not simply a development of the classical-balance debate, for it arose from a broad array of technical and experimental developments (Suárez and Barahona, 1996). By the early 1960s major new molecular techniques were used to study the evolution of organisms. Protein finger-printing, DNA hybridization, and protein sequencing provided surprising evidence about genetic similarities between species and, in the case of sequencing, about their phylogenetic relations. New objects and ideas followed, including, most obviously, the molecular clock and the supremacy of informational molecules over morphological data. The shocking finding of highly repetitive sequences (using hybridization) is especially interesting. All these objects and concepts were encompassed by the NTME, as formulated by King and Jukes (1969).

No obvious political issue, like that which framed the classical-balance debate, was connected to these developments. However, I will argue that the cybernetic turn in the natural sciences, including the use of computers and a new language, were part of larger social concerns with the development of the life sciences.

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