

**Innovation in Cultural Systems**  
**Contributions from Evolutionary Anthropology**

**edited by Michael J. O'Brien and Stephen J. Shennan**

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## Preface and Acknowledgments

Innovation has long played a significant role in the social sciences in structuring arguments about how and why human behavior changes. Certainly innovation was implicit in the nineteenth-century writings of ethnologists such as Edward B. Tylor and Lewis Henry Morgan, as it was in the mid-twentieth-century work of Julian Steward and Leslie White. For these cultural evolutionists, the appearance of cultural innovations was almost a pre-programmed process, which kicked in whenever a cultural group “needed” to overcome social- or physical-environmental problems. Archaeological explanations of cultural change, too, have long centered around the introduction and spread of novelties. American culture historians of the twentieth century routinely looked to diffusion and trade as a source of innovations, in the process adopting, often without comment, the models of their ethnological colleagues as to how and why the innovations arose in the first place.

With the renewed interest in evolution that became noticeable in the social sciences, particularly ethnology and archaeology, in the 1980s, researchers began to reconsider the role of innovation in the evolution of cultural systems. Importantly, modern evolutionary research in the social and behavioral sciences is being geared toward identifying innovation not only as a product but also as a process. In that vein, a recent workshop at the Santa Fe Institute, New Mexico, centered on the issue of innovation, building on the work of Austrian economist Joseph Schumpeter, who made the distinction between invention—the creation and establishment of something new—and innovation—an invention that becomes economically successful and earns a profit. This distinction had been made previously in biology—introduction of a novelty versus long-term success of a species—but not in the social sciences. There, the long-held belief that humans were somehow exempt from Darwinian processes such as natural selection ensured that the only brand of evolutionism discussed was of the unilinear Tylor–Morgan–White brand.

To build on the growing body of work on cultural innovation, we organized a workshop at the Konrad Lorenz Institute for Evolution and Cognition Research (KLI) in Altenberg, Austria, in September 2007. We adopted something of a similar topical approach to the Santa Fe workshop, but our emphasis was decidedly on innovation and its role in the evolution of cultural systems. All 17 participants had extensive experience with

researching innovation and had made significant contributions to the literature on the subject. We assembled what we believe to be an impressive list of participants from a number of different disciplines—anthropology, archaeology, evolutionary biology, philosophy, and psychology. We asked the participants to prepare and circulate papers before arriving in Altenberg, which allowed us to move ahead with meaningful discussion once everyone was assembled. Additionally, we asked various individuals to concentrate on select aspects of innovation so that we achieved wider coverage than we might otherwise have gotten.

By all measures, the KLI workshop was a success—a point hopefully underscored by the content of the chapters included here. The book consists of a general introduction and three sections. The introduction documents the role that innovation has played in the explanation of cultural phenomena from roughly the late nineteenth century to the present. Ethnologists working early in the twentieth century paid particular attention to what typically were termed “culture traits,” using them as a means of linking related cultures together. Archaeologists did the same. Rarely, however, was there consensus on what a culture trait entailed and at what scale it should be examined. Beginning in the 1980s there occurred an emerging interest in applying evolutionary principles to the study of culture, and one area in which considerable advance was made was the study of cultural inheritance. As interesting and valuable as these studies are, there remain areas that need in-depth research, especially with respect to the production of cultural innovation and the scale and tempo at which it is produced.

Part II, “The Biological Substrate,” offers detailed discussions of innovation from several standpoints—epistemology (André Ariew), animal studies (Kevin Laland and Simon Reader), systematics and phylogeny (Jeffrey Schwartz), phenotypic plasticity and evolvability (Daniel Larson), and EvoDevo (Werner Callebaut). One thing becomes clear after reading the papers in this section: It no longer is sufficient to think of selection as “tinkering” with subtle variations, slowly effecting change over long periods of time. Rather, there are times when innovation appears as larger packages, the product of emergent human behaviors at fairly large scales.

Part III, “Cultural Inheritance,” documents the relevance of modern insights into innovation, including the simulation of cultural innovation in the laboratory (Joseph Henrich; Alex Mesoudi), the characterization of innovation using the random-copying (neutral) model (Alexander Bentley), the demographic analysis of culturally inherited skills (Adam Powell, Stephen Shennan, and Mark Thomas), evolutionary advantages of noninnovation (Craig Palmer), and variation in diffusion and rates of cultural change (Anne Kandler and James Steele).

Part IV, “Patterns in the Anthropological Record,” presents case studies that have examined cultural innovation in the archaeological and ethnographic records. Topics include technological innovation, developmental trajectories, and modes of social organization (Valentine Roux); the study of cultural variation from a behavioral perspective

(Michael Schiffer); and innovation as a social institution (Todd VanPool and Chet Savage).

We are extremely grateful to the KLI for funding the workshop. Our hosts—Gerd Müller, Werner Callebaut, Astrid Juette, and Eva Karner—went out of their way to make the event memorable. We also thank the fellows of the KLI, who added substantially to the discussions during and between sessions. Professor Müller, who along with Professor Callebaut is an editor for MIT Press’s *Vienna Series in Theoretical Biology*, guided us through the proposal process with the press. Finally, we thank Bob Prior, executive editor of MIT Press, for his unflagging support of the project, Susan Buckley, and Katherine Almeida, our editor. Melody Galen redrafted the figures into a common format, and Carla Schlink helped edit early versions of the chapters for consistency. Regina Gregory edited the final version.