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News

The Generalized Theory of Evolution Conference, 31 January–3 Feburary

The conference, which took place from January 31st to February 3rd, 2018, at the Center for Logic and Philosophy of Science, Heinrich-Heine University, Düsseldorf, attracted academics from a wide array of disciplines and nationalities to critically engage the subject of evolutionary theory and its generalization.

With seven keynote lectures and a total of thirty-five talks delivered from the fields of Anthropology, Biology, Economics, History, Philosophy, Politics, Psychology, Sociology, and Technology Studies, the conference provided an expanded context for lively and high-level exchange across disciplinary boundaries. Although most of the scholars in attendance seemed broadly united by a common commitment to a Darwinian analysis of cultural phenomena, there also appeared a strong and vocal body of intellectuals for whom a generalization of evolutionary theory entailed not an extension of its prototypical processual characteristics to new explanatory frontiers, but rather an elaboration and formalization of the diverse mechanisms underlying adaptive transformations in biological systems. The defining attribute displayed by the make-up of the conference was unquestionably its profound heterogeneity. The various contributions differed not merely along the axes of experimental and theoretical work, as well as qualitative and quantitative methodologies, but exhibited more fundamental disparities and disagreements between the different outlooks.

The conference was initiated on January 31st with a keynote by world-renowned analytic philosopher Daniel Dennett, presenting on a memetic approach to cultural evolution and the gradual de-Darwinization of human culture. Alex Mesoudi, a prominent voice in the contemporary study of cultural evolution, began the following day with a presentation of experimental data in support of a Darwinian interpretation of cultural transformation. He outlined the possibility of synthesizing the social sciences through a process modelled on the Modern Synthesis, yet also added the caveat that not all cultural phenomena can be described equally well under a general selectionist paradigm. Using insights from game theory, computational modeling, and the mathematics of memetic evolution, Gerhard Schurz, who holds the chair of Theoretical Philosophy at the Heinrich Heine University of Düsseldorf, provided a systematic juxtaposition of the descriptions of nature and culture within a generalized theory of evolution. An inves-

tigation into the spontaneous emergence of meaningful communication using game theory as well as computational and mathematical modeling was offered by Brian Skyrms, Distinguished Professor of Logic and Philosophy of Science and Economics at the University of California, Irvine and a Professor of Philosophy at Stanford University, on the morning of the third day. Ruth Mace's analysis of kinship and residence patterns in Africa and China demonstrated the power of Niko Tinbergen's four foundational questions in ethology for explaining cultural phenomena, drawing on her work as Professor of Evolutionary Anthropology at the University College London. The final day of the conference started with the keynote lecture of Thomas Reydon, Professor for the Philosophy of Biology at Leibniz Universität Hannover, who addressed the requirements for applying a generalized evolutionary theory to a specific domain, focusing on the concept of population within the philosophy of biology. Eva Jablonka, co-author with Marion Lamb of the seminal Evolution in Four Dimensions and a key proponent of the extended evolutionary synthesis, presented an evolutionary-developmental approach to the study of culture—applying Conrad Waddington's concept of an epigenetic landscape to explain the within and across-generational inheritance of cultural characteristics ranging from religious practices to economic disparity.

Many overarching themes threaded through the conference proceedings, forming, if not a concrete and unified whole, at least a set of family resemblance conditions which brought the many keynote and contributed talks together. One such topic of primary importance was a discussion of the benefits, limitations, and applications of a memetic approach to cultural evolution, with both critiques and developments of work by Richard Dawkins, Susan Blackmore, and Daniel Dennett featured in presentations by Michael Schlaile, Martin Boudry, and Steije Hofhuis, and Dennett himself, among others. Another motif, which appeared both visually and conceptually prominent throughout the many keynote and contributed talks, was that of the Darwinian Spaces model—a graphical representation of the multidimensional gradients of evolvability and De-Darwinization, including fidelity of inheritance, smoothness of fitness landscape, and covariance of fitness differences with disparities in intrinsic properties–originally introduced by Peter Godfrey-Smith, and later adapted by Dennett towards modeling cultural evolutionary processes. It was readily apparent from the rhetoric of the conference that the notion of multiple simultaneous modes or dimensions of evolution, as proposed by Eva Jablonka and Marion Lamb, had not only made waves, but indeed shifted the tides within the biological sciences from a reductionist, gene-centric dogma to a more inclusive and pluralistic approach. Lying just below the surface of many of these discussions, though explicitly addressed in few, such as the talk of Çağlar Karaca, were questions relating to the fundamental metaphysical basis of evolutionary theory. Thinkers of the likes of John Dupré and Nancy Cartwright have provided noteworthy historical contributions to these issues, probing the nature of the core ontology undergirding the biological sciences, and the status of process, probability, and causality therein.

The role of self-organization in evolution, a notion which came to prominence in the late 20th century thanks to work of Stuart Kauffman, was made the subject of analyses by Karaca, Yoav Soen, and Nicola Bertoldi. Many also questioned the role of contingency in evolution, a subject which has been hotly disputed among biologists since it was brought to light by the late Stephen J. Gould. A second topic of much contention in the evolutionary sciences is the levels of selection debate, introduced by Richard Lewontin, and renewed by David Sloan Wilson and Elliott Sober, which was also seen to play out in the talks of Alex Aylward, Lorenzo Baravalle, Caleb Hazelwood and Lane DesAutels, and Philippe Huneman. On the centennial of the birth of the modern synthesis, the reverberating impacts of nearly a century's worth of critiques and substantial revisions, lobbied first by Conrad Waddington, later by Stephen J. Gould and Niles Eldredge, and most recently by Massimo Pigliucci and Kevin Laland, were keenly felt. The extended evolutionary synthesis was a prominent focus amongst the contributed talks, featuring in the presentations of Fermín C. Fulda, Mathias Gutmann, Hazelwood & DesAutels, Íñigo Ongay de Felipe, and Francesco Suman. Tensions between various conceptions of organismality and individuality arose during the proceedings, including the distinction between biological individuals, evolutionary individuals, and symbiotic holobionts, a topic broached by Hazelwood & DesAutels, as well as discussions relating to the categorization of replicators and organisms and their respective roles in the evolutionary process, which featured in the talks of Daniel Dennett, Mel Andrews, and Yoav Soen. From the commonality of references to the work of Mary Jane West-Eberhard and Eva Jablonka, and the recurrent motif of Conrad Waddington's epigenetic landscape, it was plain that the role of developmental plasticity in the biological sciences had become elevated to a new primacy within the field. Overarchingly, the successes of the modern synthesis and Neo-Darwinism, and their extension to super-biological domains, were both exalted and interrogated with commendable scholarly rigour. The richness and diversity of the research presented at the conference far exceeded that which may be subsumed under these broader topics, and can be painted only in broad brushstrokes. The contributions varied widely both in theoretical approach, as evidenced by the signalling games introduced in a talk by Rafael Ventura and the use of graph theory for the formalization of a causal interactionist population concept by Karim Baraghith, as well as in the phenomena investigated, from the evolution of dance analyzed by Pedro Atã & João Queiroz, to the witch hunts explained as memetic phenomena by Maarten Boudry and Steije Hofhuis, up to Özlem Yılmaz' presentation on plant stress physiology.

In its very title, the Generalized Theory of Evolution conference alluded to the potential for a unifying theoretical framework of both life and social sciences. Yet the proceedings proved, above all else, a remarkable forum in which to observe the plurality of scientific enquiry. Within the space of four days one saw the scientific process in operation on many simultaneous levels, conducting its explorations with an arsenal of heterogeneous conceptual and empirical tools, and serving manifold purposes, all united under the pursuit of establishing the explanatory scope of evolutionary theory.

Mel Andrews
Tufts University
Elmo Feiten