Contents

Page

2 **1 Review 2011 and Structure of the KLI**

6 **2 Scientific Projects**
- 2.1 Applications
- 2.2 Writing-Up Fellowships
- 2.3 Junior Fellowship
- 2.4 Postdoctoral Fellowships
- 2.5 Senior Fellowship
- 2.6 Exchange Fellowship
- 2.7 Visiting Scientists

36 **3 Meetings and Lectures**
- 3.1 Altenberg Workshops in Theoretical Biology
- 3.2 Summer School
- 3.3 Cooperative Events
- 3.4 Brown Bag Discussions

58 **4 Publications**
- 4.1 Vienna Series in Theoretical Biology
- 4.2 Professional Papers
- 4.3 Forthcoming Publications
- 4.4 Scientific Presentations

76 **5 Further Activities**
- 5.1 Celebration of 20 Years KLI
- 5.2 New Homepage
- 5.3 New Members
- 5.4 Acknowledgment

Review 2011 and Structure of the KLI

The idea of being able to bring people with diverse disciplines but with great minds and much passion together in such a tranquil atmosphere is truly magical.

Mina Bissell,
Lawrence Berkeley National Laboratory

1.1 The Year in Review

2011 was marked by the 20th anniversary of the KLI. The festive events triggered fond memories of the founding of the Institute and its flourishing over the past two decades. It was highly rewarding for the staff and functionaries to receive multiple reactions, congratulations, and acclaim from local and international friends, whom we all thank very cordially for their intellectual and emotional relations with the KLI. Our historical analysis revealed that over those twenty years more than 300 fellows and visitors spent time at the KLI; more than 600 lectures were given as part of the various types of activities; 31 books, 37 journal issues, and over 300 scientific articles were published; 64 workshops, symposia, and seminars were organized. It seems that the intentions of the founders and sponsors of the KLI have been successfully met, and we would like to reiterate our heartfelt thanks for the continued support they have provided. Their wisdom permitted to create the rare, stimulating and free environment for nurturing those keen thoughts that can no longer be entertained at the economized universities of today. We are proud of the liberal intellectual environment that has become the hallmark of the KLI.

A number of significant changes has marked the past year. Here I will only mention three: First, both the content and design of our homepage have been completely revamped. As documented in this report, the KLI has greatly increased its visibility on the Internet. Second, the journal *Biological Theory* has switched to a new publisher, Springer, in an effort to improve its turnover times, production, and international distribution. The first signs are encouraging and indicate that this was the right move. Werner Callebaut, editor-in-chief, who has had to deal with all the downstream consequences of such a major transformation, is greatly thanked for his Herculean effort. Third, and maybe most significantly, the KLI has welcomed a new executive manager, Dr. Isabella Sarto-Jackson, whose presence already has very positive effects. We wish her all the success in her future activities.

As usual, you will find the details of the past year's activities in the following pages, I hope you find joy in reading this report. My thanks go to the fellows, staff, and Board of Directors, whose continued devotion to the goals of the KLI has made these results possible.

Gerd B. Müller
Chairman

1.2 The KLI

The KLI is an international center for Theoretical Biology. The institute commits itself to the formulation, analysis, and integration of biological theories as well as the investigation of their scientific and cultural consequences. The thematic focus is on evolutionary biology, developmental biology, and cognition. The KLI supports interdisciplinary research projects in these areas that aim at generating models of living systems or meta-theoretical constructions of historical, philosophical, or cultural aspects of biological theories. Research at the KLI is supported by fellowships in seven different categories; granting decisions are based on international peer review.

The KLI also pursues its objectives by organizing international workshops, symposia, and lecture series, and by publishing a scientific journal and a book series. Moreover, the KLI runs an open access Internet database that covers bibliographic information related to the most important foci of its research, and hosts the Konrad Lorenz archive that comprises correspondence, photographs, manuscripts, diaries, and awards of Konrad Lorenz. The KLI guesthouse offers visiting fellows and guests an appealing accommodation in the immediate vicinity to the institute.

1.3 Organization of the KLI

Board of Directors

PROF. DR. REINHARD BÜRGER
Faculty of Mathematics, University of Vienna

DR. CHRISTIAN GASSAUER-FLEISSNER
Gassauer-Fleissner Rechtsanwälte GmbH

PROF. DDR. GERD B. MÜLLER (Chairman)
Department of Theoretical Biology, University of Vienna

DR. PRIMUS ÖSTERREICHER
PKF Österreicher-Staribacher Wirtschaftsprüfungsgesellschaft

PROF. DR. FRANZ M. WUKETITS
Institute of Philosophy, University of Vienna

Management

PROF. DR. WERNER CALLEBAUT
Scientific Director and Editor-in-Chief of *Biological Theory*

DR. ISABELLA SARTO-JACKSON
Executive Manager

EVA KARNER
Secretary

Scientific Advisory Board

EMER. PROF. DR. DR. H.C. IRENÄUS EIBL-EIBESFELDT
Film Archive of Human Ethology of the Max Planck Society

EMER. PROF. DR. ERHARD OESER
Institute of Philosophy, University of Vienna

PROF. DR. HANS-JÖRG RHEINBERGER
Max Planck Institute for the History of Science, Berlin

EMER. PROF. DR. PETER SCHUSTER
Institute for Theoretical Chemistry and Molecular Structure Biology, University of Vienna

PROF. DR. EÖRS SZATHMÁRY
Department of Plant Taxonomy and Ecology, Loránd Eötvös University, Budapest; Parmenides Foundation, Pullach

PROF. DR. ALESSANDRO MINELLI
Departement of Biology, University of Padua

PROF. DR. GÜNTER WAGNER
Osborn Memorial Laboratory, Yale University, New Haven, CT

External Faculty

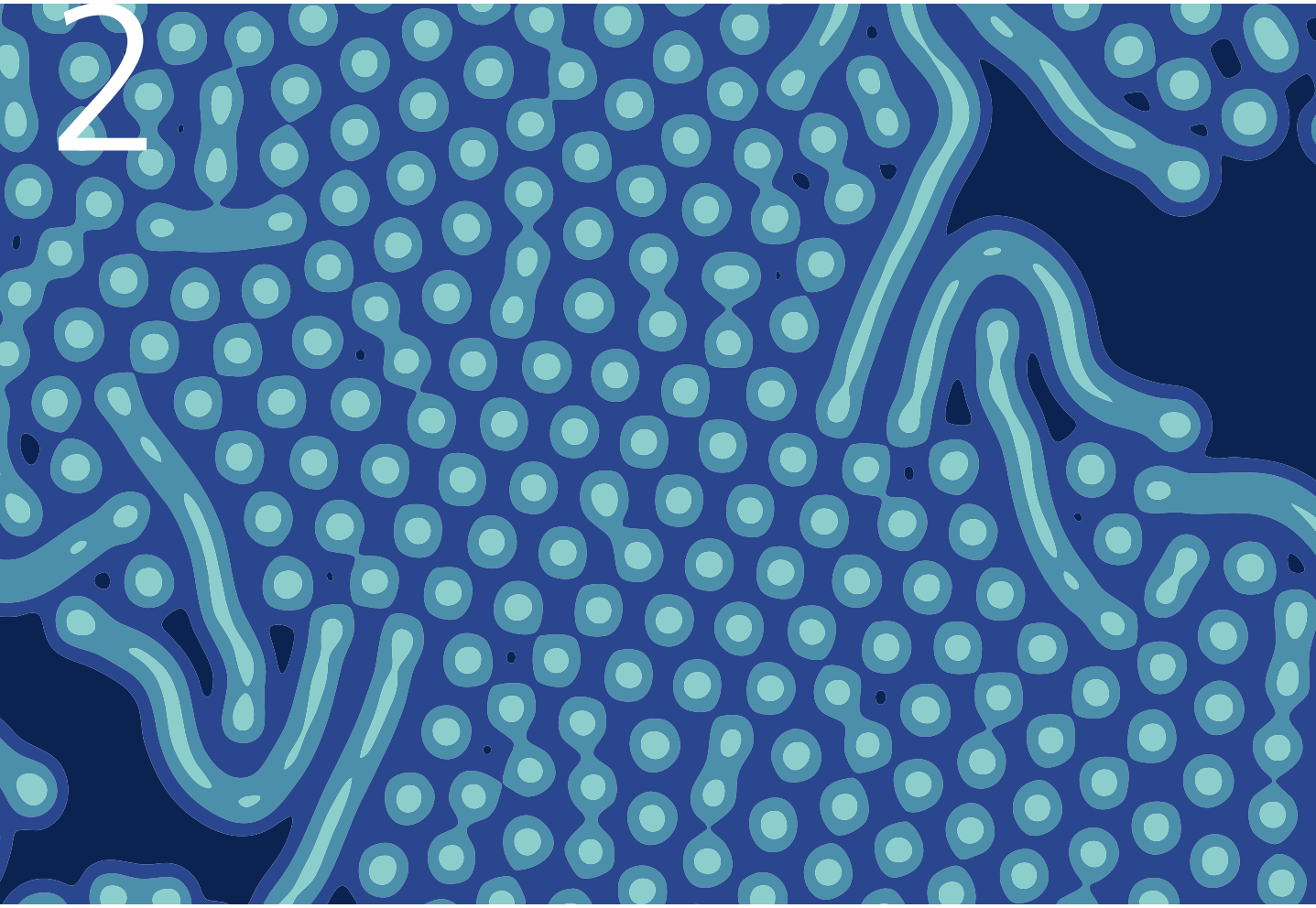
PROF. DR. WALTER FONTANA
Department of Systems Biology, Harvard Medical School, Boston, MA

PROF. DR. MANFRED LAUBICHLER
Department of Biology, Arizona State University, Tempe, AZ; Max Planck Institute for the History of Science, Berlin

PROF. DR. STUART NEWMAN
Department of Cell Biology and Anatomy, New York Medical College, Valhalla, NY

PROF. DR. D. KIMBROUGH OLLER
School of Audiology and Speech-Language Pathology, University of Memphis, TN

Scientific Projects



The KLI offers seven different types of fellowships for students, post-docs, and visiting scientists or scholars in the area of theoretical biology for a period of a few weeks up to two years. All project applications are subjected to an international review process.

2.1 Applications

In 2011, the KLI received a total of 54 applications for fellowships. 15 of these were discussed by the Board, and 11 fellowships were granted for either 2011 or 2012.

	applied	granted
Writing-up Fellowship	1	1
Junior Fellowship	1	1
Postdoctoral Fellowships	7	4
Senior Fellowships	2	1
Exchange Fellowship	1	1
Visiting Fellowships	3	3

2.2 Writing-Up Fellowships

Rachael BROWN
(February 2011 – July 2011)

Rachael Brown completed degrees in Zoology and the History and Philosophy of Science at the University of Melbourne, Australia. She was a PhD candidate at the School of Philosophy Research School of Social Sciences, Australian National University, Canberra, supervised by Kim Sterelny, and obtained a writing-up fellowship from the KLI in 2011. She is also a member of Tempo & Mode: Centre for Macroevolution and, Macroecology, ANU. Her primary research interests lie at the intersection of philosophy, evolutionary biology, and the study of animal behavior.

Understanding Behavioral Innovation, Novelty, and Evolvability

Evolutionary developmental biology has long challenged the view that the supply of phenotypic variation has little evolutionary efficacy. Central to this challenge is the claim that biases and constraints in the supply of variation exist and do alter the outcomes of the evolutionary processes. Among those interested in morphological evolution, this challenge has led to a reconsideration of the role of phenotypic variation in morphological evolution. A new understanding of the evolu-

tion of morphology that takes into account contingency and development has resulted. Interestingly, in behavioral biology very little attention has been paid to analogous issues relating to behavioral evolution. Yet, there is no theoretical or empirical reason for this apparent omission. Motivation for consideration of the role of phenotypic variation in behavioral evolution is even stronger than that available for morphology. There are clear sources of extra-genetic behavioral inheritance that carry with them bias and constraint; for example, social learning, niche construction, and genetic accommodation. The supply of variation is thus central to understanding this evolutionary domain. My doctoral thesis argues for two key conclusions: (1) That there is sufficient empirical and theoretical evidence to motivate the consideration of the supply of phenotypic variation in investigations of the evolution of behavior. A natural starting point for such a consideration is the existing conceptual framework provided by evolutionary developmental biology. And, (2) In considering behavioral evolution from an evolutionary developmental biology perspective it becomes apparent that some sources of behavioral phenotypic variation represent unique ways of affecting the evolvability of a lineage. Understanding these sources of evolvability is an essential element of evolutionary behavioral biology.

Laura NUÑO DE LA ROSA GARCÍA
(January 2011 – June 2011)

Laura Nuño de la Rosa García graduated in Humanities from the University of Alicante, and joined the doctoral program in Philosophy of Science at Complutense University, Madrid, where she defended her DEA thesis, Philosophical History of the Idea of Organismal Form: From Aristotelian Hylemorphism to Cellular Microanatomy, in 2005. She subsequently studied Biophysics at the Autonomous University of Madrid, and obtained a Master´s degree in Biophysics in 2010. Her Master´s thesis on The Origin of Paired Fins, supervised by Prof. Gerd B. Müller and Dr. Brian

Metscher, was carried out in the Department of Theoretical Biology, University of Vienna. She is about to defend her PhD thesis in Philosophy of Biology, on The Problem of Organismal Form in Contemporary Biology: a Philosophical Examination, supervised by José Luis González Recio (UCM) and Jean Gayon (Paris 1-Panthéon-Sorbonne).

The Concept of Organismal Form in Contemporary Biology: A Philosophical Examination

Since Aristotle, organismal form (i.e., the geometrical and topological properties of biological entities at the organismal scale) has had a privileged role throughout the history of biology, reaching its apex in the first half of the 19th century with so-called rational morphology. After Darwin, morphology was transformed into evolutionary morphology, but the prominence of Form progressively weakened due to the mechanistic attacks coming from a twofold front: the physiological approach to development and the populational approach to evolution.

Nonetheless, since the publication of the *Origin* heterodox philosophers and biologists had claimed that many of the classical questions in the philosophy of nature and in natural history had not been solved by neo-Darwinism but just been ignored. In particular, the Modern Synthesis was not satisfying for two of the most important disciplines in the biosciences that have organismal form as their main subject: morphology and developmental biology. Since the early 1980s the increasing dissatisfaction with the 'received view' (in particular the questioning of genetic reductionism and adaptationism) has brought with it new biological disciplines and new conceptual approaches in theoretical biology and the philosophy of biology that vindicate the return of organismal form.

Taking into account the historical roots of morphological questions, my thesis investigates the current research programs dedicated to the study of the nature, generation, and evolutionary transformation of organismal form with the goal of clarifying the philosophical implications of the renewed concept of Form in contemporary biology.

Joeri WITTEVEEN
(November 2011 – April 2012)

Joeri Witteveen obtained his liberal arts undergraduate degree from University College Maastricht, the Netherlands, in 2006. He took courses towards his degree at the University of California, Berkeley. In September 2007 he finished his work on theories of cultural evolution for the MSc in Philosophy of the Social Sciences at the London School of Economics and Political Science. He is currently pursuing a PhD in History and Philosophy of Science from the University of Cambridge.

Rethinking Typological versus Population Thinking: A Philosophical Examination of a Disputed Dichotomy

The problem my doctoral research focuses on is the discord between communities of historians of biology, philosophers of biology, and practicing biologists in interpretation, use, and evaluation of the distinction between 'typological thinking' and 'population thinking.'

In the years since biologist Ernst Mayr introduced this dichotomous distinction, it has spread through textbooks, articles and anthologies in different disciplines. Some take the distinction to be no more than a rhetorical device, others think it brings out fundamental metaphysical and/or epistemological differences that are relevant from a historical perspective or in contemporary scientific practice.

The widely divergent interpretations of the meaning and relevance of the distinction come together in the philosophy of biology. There the distinction is invoked in a variety of discussions on conceptual issues in evolutionary biology, without there being much uniformity in its interpretation and deployment. To mitigate polysemy within the philosophy of biology and to promote communication between historians, philosophers, and evolutionary biologists it is important to put the distinction on a firm footing.

Reassessing and continuing recent work in the history and philosophy of biology will help us to acquire a better understanding of what the distinction between typological and

population thinking is a distinction between, what its relation is to other long-standing conceptual issues, and what its relevance is to topical issues in evolutionary developmental biology and systematics.

2.3 Junior Fellowship

Jan VERPOOTEN
(January 2010 – December 2011)

Jan Verpooten obtained his MSc in Biology from the University of Antwerp, Belgium. He studied the social behavior (conflict management) of spider monkeys in the wild in Yucatán, Mexico, as a research assistant of Prof. Filippo Aureli, John Moores University, UK. For some years now he has collaborated with Prof. Mark Nelissen of the University of Antwerp (Behavioral Biology) in developing an evolutionary approach to human artistic behaviors. He is preparing a PhD on this subject.

Sensory Exploitation and Artistic Behavior

Aesthetic and artistic behaviors (producing and experiencing paintings, sculptures, dance, music, story-telling, ...) are human universals: they appear stably across human cultures. Evolutionists generally assume that universality of a trait indicates the presence of some underlying evolutionary process that causes its persistence. However, no real agreement exists as to which evolutionary process is actually responsible in this case. Extant hypotheses differ on crucial points. Is art an adaptation or not? On which level (genetic, cultural, …) is it selected for? Which mechanism (mating display, group bonding, ...) is responsible for its evolution? These differences boil down to the problem of the high costs of art (it is a resource-, time-, and energy-consuming behavior). How could such a costly behavior have emerged? Are the costs compensated by benefits (art as an adaptation)? Or are they merely borne by a system that can support a certain amount of suboptimal variants (art as a consequence of non-adaptive evolution)?

To answer these questions we need a framework in which

all hypotheses about art can be considered. To this end I have proposed a hypothesis based on sensory exploitation. It basically states that sensory, but also learned biases in the receiver of signals can influence the content and design of these signals through evolution. In a mimicry system, for instance, biases in the receiver are exploited by mimicking adaptive signals. For example, egg spots in male cichlids, which mimic real eggs quite accurately, are believed to have evolved by exploiting female receiver bias for eggs. Egg spots are genetically transmitted, but signals that evolved under the influence of receiver biases can also be culturally transmitted, as we argue is the case with visual art. This view of the evolution of art allows to articulate existing hypotheses. It also allows to make predictions: it explains why iconic representations (e.g., rock art) only emerged some 40,000 years ago. Although we have been able to draw some conclusions from initial investigations, we have only scratched the surface of the possibilities the concept of sensory exploitation offers.

2.4 Postdoctoral Fellowships

Naomi BECK
(September 2010 – August 2011)

Naomi Beck's research focuses on the use of of evolutionary concepts in political and economic thought. She obtained her PhD from the University of Paris-1 (Panthéon-Sorbonne) in 2005. Her revised dissertation will be published in 2011 under the title Les politiques de l'évolution: Spencer et ses lecteurs en France et en Italie. She was an assistant professor at the University of Chicago (2005-2009) and held research fellowships at the University of Bologna, the Max Planck Institute for the History of Science in Berlin, and the European University Institute near Florence. Her current book project on Hayek's evolutionary thinking is titled The Great Economic Miracle: Cultural Evolution and the Free Market.

Of Unintended Consequences: Evolution and the Free Market in Hayek's Thought

Friedrich August von Hayek (1899-1992) was undoubtedly one of the most consequential political thinkers in the twentieth century. He influenced policy makers such as Margaret Thatcher and Ronald Reagan as well as leading economists such as Milton Friedman, whose legacy lives on and in the Chicago School of Economics. Recently, Hayek's work has become the object of increased scholarly interest. The University of Chicago Press is publishing an edition of his collected writings, and no less than four biographies have appeared in print since the year 2000, in addition to more specific monographs on Hayek's social, economic, and political philosophy. However, the new wave of studies has paid relatively little attention to the central role of evolutionary considerations in Hayek's thought. It is this lacuna that my book seeks to fill. A close look at Hayek's use of evolutionary ideas is likely to provide new insights concerning the old 'social Darwinist' question, a misnomer for the question of the relationship between evolutionary biology and politics. In my study I propose to investigate Hayek's claims with reference to past developments of a similar vein (e.g., Herbert Spencer), and compare them with those of Karl Popper and Darwin. I intend, in this way, to highlight the problematic aspects of the parallels Hayek drew between economics and evolutionary biology. I will also emphasize Hayek's modernity and the originality of his contributions to the ongoing debate on the meaning of evolution in the social, political, and ethical realms. I will analyze, for instance, his developments in theoretical psychology, e.g., neural network modeling, and relate them to the work of modern evolutionary psychologists. I will also examine Hayek's theory of group selection, the cornerstone in his project to give an evolutionary interpretation of the growth of human civilization, and the object of heated controversies in sociobiology today. Finally, I will examine Hayek's attempt to assign normative content to the outcome of social evolution and explore his extensive use of biological analogies in support of what he termed 'the liberal society.' I will challenge Hayek's

interpretation of natural development to see whether it bears out the weight of his staunch attack on socialist reforms and is able to buttress his free market politics.

Brett CALCOTT
(April 2011 – November 2011)

Brett Calcott holds a BA Honours (1st Class) from Victoria University, Wellington. He obtained his PhD from the Australian National University, Canberra in 2007. Since 2007 he has been a post-doctoral researcher in the Philosophy program at the Australian National University. In November 2011 he returned to the ANU to continue working on a project on 'Evolvability.'

Biomorphs Upgraded: Modeling Facilitated Variation

Two related problems drive this project. The first is: what properties of development make organisms evolvable? A number of properties have come under scrutiny in recent years, such as modularity and robustness. Recently, Kirschner and Gerhart have proposed a theory of ´facilitated variation,´ which includes a number of very general properties that make organisms more evolvable. This raises the second question: how should we discover, define clearly, and explore the relations between such properties? One way, of course, is by looking closely at the actual biology, honing our sense of what these properties are by examining particular examples, such as Kirschner and Gerhart do. An alternative approach would be to explore these ideas using a series of simple, abstract, models. These kinds of models proved enormously useful for understanding complex ideas in other areas of biology. They help by clearly articulating and disambiguating the assumptions in verbal ideas, and they have been used effectively to clarify complex debates. The project I propose for the KLI is a speculative (and modest) contribution to such a modeling endeavor. I will focus specifically on the ideas central to Kirschner and Gerhart's theory of facilitated variation and try

to capture the operation of these principles in simple, abstract, models. Their theory is a good candidate for this kind of study, for although it provides an extremely clear and systematic approach to the subject, there has been little modeling performed concerning the properties they outline. My modeling proposal is partially inspired by Dawkins´ visually compelling biomorphs — a modeling project which, like Kirschner and Gerhart´s, focused on the production of variation rather than selection. It was during his attempts to modify the algorithm for development to produce a broader and more diverse set of shapes that he found that adding some features of development made the creatures more evolvable. The aim of the modeling project is to keep the visual and interactive aspects of the biomorphs, but to add a series of progressive variations in the algorithms that govern development, incorporating features capable of expressing the ideas that Kirschner and Gerhart present in their work. It will be by contrasting the generative power of different models that the effectiveness of the properties can be ascertained. In addition, trying to build these ideas into simple models will force assumptions into the open, perhaps identifying parts of their theory that are underspecified. As evidenced by Dawkins' original thoughts about evolvability, the mere act of trying to build models can be revealing in itself.

Ellen CLARKE
(December 2010 – September 2011)

Ellen Clarke has a First Class Honours Bachelor degree in Philosophy from the University of Leeds. She made her Master´s degree in Philosophy and History of Science and completed her PhD in Philosophy at the University of Bristol in 2010, where her PhD thesis 'Biological Individuality and the Levels of Selection' was supervised by Prof. Samir Okasha. In 2009, she held a visiting position at the Australian National University.

Generating Biological Individuality

I argue for a science-driven understanding of biological individuals as products of a dynamic evolutionary process. My very recent work has involved undertaking a detailed investigation of the idiosyncrasies of the biological individuality problem with respect to plants. I started to uncover crucial ways in which definitions of the individual that hold for unitary organisms – and that underpin most abstract theoretical models on which scientific definitions of the individual have recently been based—are not generalizable: they cannot be carried over to other, less paradigmatic organisms and still play the role demanded of them. It has given me insights into the extent to which central concepts in the theory of natural selection are biased towards higher metazoans. Once you move away from that group, totally different phenomena become central. For example, with respect to unitary organisms germ-soma separation and bottleneck life cycles are cornerstones of individuality, but once you look at organisms with a modular organization in which the body is constructed out of a series of repeating parts, as in plants and many marine invertebrates, germ separation and bottlenecks just lose all relevance for the problem of individuality. I carry out an in-depth analysis of the way in which modularity thus constitutes a unique domain for the individuality problem, as well as for evolvability, major transitions, and the evolution of complexity. For example, in a forthcoming publication for Sterelny and Calcott's edited collection, *The Major Transitions in Evolution Revisited*, I argue that the modular organization of clonal plants makes them subject to an idiosyncratic kind of selection, in which the entity that we commonly refer to as 'the individual' actually evolves within a generation.

What I want to do next is push this idea further and try to develop a truly general thesis that succeeds in unifying the notion of biological individuality across all corners of the tree of life. Ultimately I want to generate a definition that is informed by detailed consideration of the particularities of as many different major groups of organisms as possible, including symbiotic unions, social insect colonies, and bacteria.

Elisa FRASNELLI
(January 2011 – January 2013)

Elisa Frasnelli has participated in a PhD program in Cognitive and Brain Sciences at the University of Trento from 2007 to 2010. Before starting her PhD she spent several months in 2006 and 2007 at the Laboratory of Fluorescence Dynamics, Biomedical Engineering Department, University of California at Irvine. In 2009 she worked at the Centre for Neuroscience and Animal Behaviour, University of New England, Armidale, NSW, Australia, and in 2010 at Coffs Harbour, NSW, Australia where she performed studies on Australian native bees in the field.

The Evolution of Brain and Behavioral Asymmetries: Theoretical Models and Empirical Tests

Recent studies have revealed a variety of left–right asymmetries among vertebrates and invertebrates. In many species, left- and right-lateralized individuals coexist but in unequal numbers ('population-level' lateralization). Using mathematical theory of games, it has been shown that, in the context of predator-prey interactions, population-level lateralization can arise as an evolutionarily stable strategy when individually asymmetrical organisms must coordinate their behavior with that of other asymmetrical organisms (Ghirlanda and Vallortigara, 2004). Recently, I took part in further modeling (Ghirlanda et al., 2009) showing that populations consisting of left- and right-lateralized individuals in unequal numbers can be evolutionarily stable, based solely on strategic factors arising from the balance between antagonistic (competitive) and synergistic (cooperative) interactions. Empirical evidence supporting the model have been provided by comparative studies in insects of the Hymenoptera Apoidea family, showing social and non-social organization (Anfora et al., 2010), suggesting that stable polymorphism with an uneven distribution of left- and right-forms can be expected to emerge spontaneously in species in which left-right biases have behavioral consequences during everyday interactions between individuals.

The aim of my research project is to consider how strategic

factors interact with other potential determinants of lateralization, in particular genetic mechanisms of lateralization, integrating our game-theoretical approach with more traditional genetic models based on research on human handedness. As to the empirical part of the project, I would be interested to investigate other species of insects showing different degrees of sociality. Comparative research with several species of Hymenoptera both in the field and laboratory may provide important insights in the evolution of left-right asymmetries in behavior and in the nervous system.

Aida GÓMEZ ROBLES
(March 2011 – February 2012)

Aida Gómez-Robles completed her PhD in Paleo-Anthropology (Biological Sciences) at the National Research Centre for Human Evolution (Burgos) and at the University of Granada in May 2010. Her research consists mainly in the analysis of morphological variation and evolution of human dentition using geometric morphometric techniques. Her current research interests include the use of quantitative methods to better understand the evolution and development — and the interaction between both processes — of teeth and other serially homologous systems.

In Silico Evolution of Hominin Dental Morphology

Geometric morphometric analyses of skeletal remains are becoming more and more common in paleo-anthropological research. These methods provide not only a complete description of morphological variation, but also new datasets that can be used to examine the dynamic processes underlying morphological variation. The evolution of teeth, from which many evolutionary inferences are drawn, is constrained by different factors, including phylogenetic, developmental, and functional ones. Quantifying and characterizing these factors is fundamental to test the accuracy of evolutionary scenarios inferred from cranial and dental traits. The analysis of hominin dentition can also help us to understand the evolution and

development of serially homologous structures, which appear when a developmental program is multiplied and expressed in a new location. Morphological analyses of teeth can shed some light onto the developmental mechanisms constraining diversification and the functional pressures causing differentiation within homologous series. Previous research on human evolution has assumed a neutral mode of change for the dental system without testing this hypothesis, thus biasing many results derived from dental features. This assumption is based on an expected similarity between dental and cranial characters, which show a pattern of neutral evolution. However, these different features may be subject to different selective pressures, being effectively located in different evolutionary scenarios. In this light, *in silico* studies based on computer simulations provide an experimental framework to test hypotheses about evolution on a paleontological time scale and with an illustrative visual output. This approach is useful for delineating theoretical possibilities and eliminating some specific simulation models, with all the parameters assumed by it, by comparing model results with actual paleontological data. Theoretical possibilities observed as a result of the simulations but not explored by evolution can clarify the mechanisms underlying biological variation.

Miles MACLEOD

(November 2009 – October 2011)

Miles MacLeod holds a Bachelor of Science degree from Sydney University and a Master of Science degree from Utrecht University, where he participated in the master program ´History and Philosophy of Science.´ He obtained his PhD from the University of Vienna, where he worked on the historical epistemic roles of theoretical entity concepts within the Initiativkolleg ´Naturwissenschaften im historischen Kontext.´

The Epistemic-Only View of Natural Kinds

My project concerns the relevance of the concept of natural kind to our understanding of scientific practice, particularly within the life sciences.

Most discussion of natural kinds these days does in fact occur with respect to the life sciences, where the concept seems central to claims of these fields but is at the same time deeply problematic. It has been difficult to say what natural kinds are in this context, when many examples such as 'species' do not seem to be reducible to a precise set of essential properties, but admit exceptions, historical changes in their descriptions, or multiple realizability. This failure has prompted the question whether there is in fact any value in a 'natural kind' concept at all.

I believe, however, that this conclusion is premature, as it fails to appreciate the deep conceptual and investigative roles that concepts considered 'natural kinds' play in the life sciences as often the very basis around which these fields are organized. It is thus in the context of elaborating and accounting for practice that the concept of natural kind is required.

My project sets out to argue that philosophers should take an 'epistemic-only' view of natural kinds, whereby our task is to understand their epistemic contributions to scientific practice (as bases of categorization, inductive generalization, and explanation), and the way in which research processes conceptually depend upon them. With this perspective, the sense of 'natural' of the concept is not interpreted ontologically, but is rather cashed out in terms of the beliefs scientists have towards the concept and how this affects their use of it. The project will develop this viewpoint with respect to case studies from the life sciences, where the aim is to investigate how the 'natural kind' concept is epistemically central to research practices. I will argue that with this approach to natural kinds we stand to have a better understanding of the basis upon which research processes, and in turn conceptual frameworks, evolve.

Daniel NICHOLSON
(January 2011 – December 2012)

Daniel Nicholson holds Masters degrees in Molecular and Cellular Biology (University of Bath) and in History and Philosophy of Science (University of Leeds). In 2010 he obtained his PhD in Philosophy (University of Exeter). His doctoral thesis presented a critical examination of mechanistic thinking in biology. He is particularly interested in the role of machine models in biological explanations, in the task of providing a naturalistic account of organismic purposiveness, and in philosophical arguments for the autonomy of biology. He also has a longstanding interest in the history of theoretical biology.

The Organicist Conception of Life: Rethinking the Nature of Organism

This project is concerned with the theoretical foundations of our biological understanding of the nature of organisms. Since Descartes, the dominant school of biological thought regarding the nature of life has been mechanicism, which conceives organisms in analogy with machines. Guided by this conception, mechanicism understands biological wholes in terms of the activities of their component parts; it characterizes the properties of living systems from the bottom up in increasing levels of complexity; it emphasizes the causal and material attributes of organisms over their organizational and teleological features; and it vindicates the appeal to explanatory reductionism in the study of organisms. Although mechanicism has played a fundamental role in the historical development of biology, and indeed still underlies many areas of biological inquiry today, there is a growing awareness in the biological community that it no longer provides an adequate theoretical framework in which to make sense of the most recent advances in our understanding of organisms.

The project attempts to lay the philosophical groundwork for the articulation of a biologically compelling theoretical alternative to the mechanistic conception of life. To do so, the project draws on the rich, yet largely neglected anti-

mechanistic tradition in biology. In the early twentieth century, a number of theoretical biologists, including J. B. S. Haldane, J. H. Woodger, and L. von Bertalanffy, used the classic vitalistic critiques of mechanicism to develop a new naturalistic theory of the organism called organicism. Organicism takes the teleological self-organizing nature of living systems as the hallmark of their ontological distinctiveness, and by implication regards biology as an autonomous science possessing its own theoretical principles distinct from those of physics and chemistry. Although organicism flourished for a brief period, it was eclipsed by the molecular revolution that swept biology in the 1950s, which consolidated mechanicism for the rest of the century.

The main contention of the project is that organicism possesses the necessary intellectual resources to supplant mechanicism as a general theory of living systems. Thus, the project aims to use the pioneering ideas of several early twentieth century theoretical biologists as a springboard to formulate an organicist philosophy of the organism capable of coming to terms with the latest empirical findings of biology. The project is not only concerned with biological ontology, as the organicist conception of life also has important implications for the study of living systems and our understanding of biology as a science.

Christine SCHWAB

(December 2009 – November 2011)

Christine Schwab studied Cultural Anthropology and Sociology at the University of Vienna and received her Master`s degree, supervised by Prof. Andre Gingrich, working on the identity process of the Hungarian ethnic minority in Austria (for which she was awarded an academic prize). She then studied Zoology at the University of Vienna, completing her MSc under the supervision of Prof. Ludwig Huber, investigating the ability of dogs to differentiate degrees of attention of their owners. She held a PhD position in a FWF project for studying the influence of social relations on

social learning in corvids, and was responsible for establishing jackdaws as a new research species at the KLF (Konrad Lorenz Research Station) in Grünau, Upper Austria. In Spring 2009 she collaborated with Prof. Ronald Noë at the CNRS in Strasbourg, France, on biological markets. She was awarded the Laudimaxima Prize from the University of Vienna for promoting women in the natural sciences and mathematics.

Social Networks in Corvids

My interest concentrates on the evolution of social behavior by investigating structural and functional aspects of jackdaw, *Corvus monedula*, and raven, *Corvus corax*, social systems. I will employ a theoretical approach and methods that originated in mathematical graph theory and are new and innovative in animal behavior research: social network theory and social network analysis (SNA). The project comprises two objectives: first, to generate and analyze networks in these two species and to investigate their comparability and changes over time; second, to experimentally address the question which social networks influence transmission of information and access to resources within the group. Data on social interactions already exist. They consist of two years of observations on one captive colony each, one year on a wild jackdaw colony; data on wild ravens are currently collected. SNA has several important advantages:

1) It provides mathematical evidence for the composition of networks, contrasting with former a priori classifications by the human observer. 2) It allows a more detailed analysis of the social fine structure of groups by going beyond categorization (by sex, age, kinship, mating system, etc.). 3) It provides several analytical measures to allocate subjects certain structural positions within the group, such as centered, marginal, or bridging positions. 4) Results of SNA yield nondimensional values that allow comparisons between groups, populations, or species.

Objective 1: Analysis of social interactions is expected to result in 4 networks (sociopositive, spatial association, agonistic, defensive) that differ distinctively with regard to several SNA measures. Each of these networks will be analyzed in three time periods, reflecting different periods in the birds` annual cycle. Comparisons of networks between periods, contexts (in the wild and in capti-

vity), and species will show how networks change over time, and will provide better insight into the social structure of jackdaw and raven colonies.

Objective 2: Investigating the functional value individuals can draw from their social networks in two different contexts. First, two antithetic hypotheses will be tested regarding propagation of information within a group. Hypothesis A is commonly found in the literature: spatial proximity/ affiliation between individuals enhances social learning and, therefore, information transmission within groups should follow affiliation patterns between group members. Hypothesis B stems from human sociology: weak ties are important for information transmission (tie = sociopositive and symmetric). Therefore, information transmission should follow agonistic patterns between group members. In two experiments 18 jackdaws will be tested in a group setting. Determination of the order of individuals succesfully manipulating a testing apparatus and getting access to the testing apparatus will then be compared with the structure of the birds` networks to assess which networks influence the pattern of information transmission and which regulate access to limited resources. The results should show how individuals benefit from these respective networks.

Eran SHIFFERMAN
(March 2011 – February 2012)

Eran Shifferman studied Biology at the University of British Columbia. He obtained his Bachelor´s degree in Biology from Tel Aviv University in 2003. He studied at the Cohn Institute for the History and Philosophy of Science and Ideas (2004-2005) and in 2006 joined a PhD program at the Philosophy Graduate School, Tel Aviv University, which he completed in 2011. Shifferman was awarded the Rotenstreich Scholarship for Outstanding PhD Students (2006- 2011).

A Theoretical Eco-evolutionary Account of the Complexification of the Quantity Estimation Aptitudes in the Animal Kingdom

My project is a theoretical eco-evolutionary account of the complexification of the quantity estimation (QE) aptitudes in the animal kingdom. I wish to bring together all the sub-disciplines that deal with any aspect of QE in order to create a combined body of knowledge that can be used as bedrock for the implementation of a new kind of evolutionary analysis, which constitutes a full-bodied, rich, and coherent tale of complexification.

My basic premise is that quantity is omnipresent, highly useful information for survival and, as such, mechanisms that allow for its perception and processing have emerged, persisted, and complexified during evolutionary history. By complexification I assume that in order to shift from one aptitude to the next, more cognitive elements need to be integrated. This process had shaped a continuum of different cognitive manifestations of QE ranging from quorum sensing at its origin and culminating in mathematics. I also argue that QE is a composite behavior utilizing independent cognitive pathways, which in turn serve as its foundation while simultaneously possessing contextually antagonistic and competitive functions. By 'composite' I mean that in order to be able to relate to quantity, an organism already relies on other available perceptual and/or cognitive traits operating on the same stimulus. I consider these other traits to be the building blocks of QE. 'Competition' means that the sheer utilization of these building blocks automatically offers them concurrently as a viable alternative solution to the task. This interweaving is the source of both the emergence of QE complexification (phylogenetically) and of its hindrance (ontogenetically). I also suggest a plausible mechanism behind the evolution of QE and claim it is guided by exaptation and neurological redeployment: old and new cognitive pathways vie for 'processing rights' and exert selection pressure on each other.

I will offer a new eco-evolutionary narrative, complete with ontogenetic and phylogenetic mechanisms that utilize neurological models and evolutionary theory. Then I will demonstrate how the proposed framework brings to the surface a new perspective of the evolution of cognition by using select examples.

2.5 Senior Fellowship

Wayne CHRISTENSEN
(February 2010 – January 2011)

Wayne Christensen studied Philosophy at the University of Newcastle, Australia (PhD, 2000), and worked as a post-doctoral research associate with the Complex Adaptive Systems Group there in 2000-2001. He was a post-doctoral fellow at the KLI (2002-2004) and in the Philosophy Department at the University of Kwazulu-Natal, South Africa (2004-2006). More recently (2007-2009) he has been a research fellow in Philosophy and Cognitive Science at Macquarie University, Australia. Dr. Christensen is currently working on a book that investigates the cognitive and biological foundations of personal agency. The objective is to promote a broad-based engagement between philosophical agency theory and empirical cognitive research. Within this larger project he is currently developing an account of the respective roles of automatic and higher cognitive processes in skilled action, and a naturalist approach to the foundations of normativity. In recent work he has proposed a theory of the role of hierarchically structured control and model-based representation in the evolution of cognition.

A Naturalist Theory of Agency: Biological and Cognitive Groundings

The goal of this project is to complete a book project that will be submitted to the 'Cognition, Brain, and Behavior series' of MIT Press. The book will develop a theory of the cognitive and biological grounding of personal agency. Agency is a central topic of research in philosophy with fundamental and wide-ranging significance. Reflective agency is commonly regarded as central to personhood, autonomy, and moral normativity. As such it has great practical significance. Most philosophers take the cognitive basis for reflective agency to be more or less self-evident and unproblematic. However, some influential strands of empirical and philosophical research have challenged the causal role of introspective awareness in cognition.

In philosophy of cognitive science Dennett (1991) has influentially criticized 'Cartesian theater' views that posit a central locus for conscious awareness and control. There have been numerous philosophical responses to the more influential challenges. But given the breadth of the empirical and conceptual issues, what is needed is not a piecemeal response to specific experiments, but rather a broad-based engagement between agency theory and empirical cognitive research. The book will develop such an engagement, and will have four main theoretical components: (1) an account of the integrated operation of automatic and controlled processes in voluntary action control, (2) a theory positing a common basis in hierarchical control for goal-directed and reflective agency, (3) a theory of agent individuation that takes biological individuality as a template, and (4) a theory of the naturalist grounding of agency norms.

2.6 Exchange Fellowship

Stephan HANDSCHUH
(September 2010 – January 2012)

Stephan Handschuh studied Zoology at the University of Vienna, focusing on theoretical evolutionary biology, morphology, and imaging methods. He currently works on his Doctoral thesis at the University of Vienna, where he also lectures on 3D imaging and visualization methods and histology.

Sexual Selection and Assortative Mating: Key Factors in the Evolution of Crustacean Bodyplans?

Population and developmental genetics represent two prominent approaches of modern evolutionary research. Within the field of evolutionary developmental biology (EvoDevo), the evolutionary developmental genetics approach gained importance due to progress in cloning and visualization techniques. Today a fusion of classical population genetics and developmental genetic data seems both challenging and necessary. On

the way towards synthetic interpretations and evaluations of evolutionary scenarios there is a need for model systems that are well investigated in both regards. The bodyplans of higher Crustacea (Malacostraca) may present such a model system.

I introduce a number of hypotheses that implicate complex mating systems and their population genetic consequences as key factors in the evolution of Malacostracan bodyplans. Sexual selection in particular is assumed to act directly on the expression patterns of developmental regulatory genes underlying the morphology of structures that are crucial for mating behavior. The main part of this work is the detailed investigation of the complex mating system of *Dikerogammarus villosus* (Amphipoda), using modern and innovative techniques like x-ray microCT for acquiring morphometric data. Based on the combination of morphometric and regulatory gene expression data, this study may yield new insights into the mechanisms of Malacostracan bodyplan and appendage evolution.

2.7 Visiting Scientists

Ehab ABOUHEIF
(February 2011 – July 2011)

Ehab Abouheif studied Biology at Concordia University, Montreal (BSc, 1993), at SUNY, Stony Brook, NY, and at Duke University, Durham, NC. He was a post-doc in the Department of Organismal Biology and Anatomy at the University of Chicago (2002-2003) and in the Department of Integrative Biology, Howard Hughes Medical Institute, University of California, Berkeley (2003-2004); Nipam Patel was his supervisor both in Chicago and Berkeley. From 2004 to 2010 he was assistant professor at McGill University, Montreal, Quebec, and he is currently an associate professor in the Department of Biology at McGill University, where he holds the Canada Research Chair in Evolutionary Developmental Biology.

The Theory of Mesoevolution

As a Visiting Fellow at the KLI, my main goal was to make substantial progress, writing a monograph that expands and formalizes my 'Theory of Mesoevolution' (Abouheif 2008. Parallelism as the pattern and process of mesoevolution. Evolution & Development 10 (1): 3-5). This theory, which promises to potentially connect the domains of micro- and macroevolution, tackles one of the largest and unresolved questions in evolutionary biology. It attempts to make this connection through the concept of parallelism, which is often defined as the independent evolution of traits that share a common developmental basis. Parallel evolution is widespread and represents a 'gray zone' between homologous and convergently evolving traits. I will argue in my monograph that this gray zone is the key for linking micro- and macroevolution.

Domenic BERDUCCI

(July 2011 – September 2011)

Domenic Berducci did his AB degree in Anthropology at Temple University in Philadelphia, focusing on human evolution, and continued at Temple for his MA in Anthropology doing work in cultural evolution. He completed his PhD at the University of Pennsylvania in Sociology working on cognition and learning in social interaction. He was a visiting fellow at the KLI, and works as an associate professor at Toyama University in Japan. His current research interests concern accounting for the ontogenetic origin of sociality in human infants biologically, without invoking innate cognitive ´phenomena.´

From Infant Reacting to Understanding: Emergent Sociality and Personhood through Infant/Caregiver Interaction

How to explain the ontogenetic origin of sociality in human infants without invoking innate cognitive phenomena (grammar, language for thought, and so on)? My research will

describe the biological origin of sociality in infants without assuming any preexisting, innate cognitive or social abilities. I implicitly counter cognitive science claims both by argument and a detailed Conversation Analysis (CA):
1) Employing claims from the philosophy of Wittgenstein (and secondarily L. Vygotsky and S. Weil), I argue that cognition is not necessary for social interaction to exist and/or ensue.
2) I demonstrate these claims through a CA of infant/caregiver interaction in various languages.
3) I demonstrate how Wittgenstein´s claim that sociality in the form of turn-taking is built on infants´ natural (biological) reactions.
4) I will also demonstrate that infants´ biological reactions occasion and are occasioned by caregivers' interactional turns, allowing interaction to be orderly, and thus grounding infant sociality.
5) The grounding of infant sociality provides the ground for general society.

In CA, a strong claim exists that the primordial site for sociality is social interaction (Schegloff 2007). This claim constitutes my starting point. It begs the question, however, of what is the (ontogenetic, not phylogenetic) origin of sociality for individuals. The unreflective answer has been interaction, or ´talk´ as the CA people claim. However, the very existence of CA as a research methodology assumes the existence of talk or conversation as a constituent part of interaction. Young infants (0-5 months in my study) cannot talk, invoking additional problems and questions for CA methodology. If infants cannot talk, and if talk is the primordial site of sociality, then how does sociality originate in individual infants? Of course the nativists/innatists such as Chomsky, Fodor, Pinker, and many others offer the answer that a priori cognitive phenomena exist, such as innate grammar, which allows society and language to develop. On the other side stand the behaviorists, who claim that society or social structure is merely a complex form of a child imitating adult behaviors. Both of these positions are untenable from my (Wittgensteinian/CA) research point of view. Employing Wittgenstein´s claims as the ground of this research, I focus on infants' biological reactions, crying, gazing, drinking bottle, and so on, as behaviors that are

reacted to caregivers, and are at crucial times by the caregiver, treated as if the infants´ biological reactions are legitimate social interactional turns, as if infants were mature social members. In acting so, caregivers create criteria (acting as if) for the legitimacy of the infants´ turns. The preliminary results of my research so far seem to demonstrate that it is indeed these infant biological reactions and a particular orientation to same, by caregivers, which seems to ontogenetically initiate sociality in infants. I will examine if and how turn-taking and sequencing exist and continue in infant/caregiver interaction, and how these interactional devices foster infant sociality, which then presumably fosters the learning of language.

Sabine BRAUCKMANN
(November 2010 – March 2011)

Sabine Brauckmann studied Philosophy, Mathematics, and Slavic Literature and Languages at the University of Münster. She finished her PhD work in 1997 with a thesis on the organismic systems theory of Ludwig von Bertalanffy. Until 2000 she was a research associate of the Institute of Philosophy, University of Münster. Meanwhile she also conducted projects on the history of theoretical morphogenesis and the scientific life of Paul A. Weiss as a visiting scholar of the MPI for Neurobiology, the Rockefeller Archive Center, and the Department of Medical Genetics, University of Utah. The German Research Foundation awarded her a Research Fellowship to continue her biographical project on Paul A. Weiss at Dartmouth College and Johns Hopkins University until early 2003. She was a post-doctoral fellow at the KLI in 2003-2005.

A Laboratory in the Prater: The Biologische Versuchsanstalt in Vienna

The book project 'Vivarium' will be a detailed study of the research program of the Biologische Versuchsanstalt in Vienna (1902-1945). The objective is to locate the Vivarium inside the

context of experimental and theoretical biology from 1900 to 1940, to map its networking grid that connected it to other Austrian and international research institutes, and to trace its diverse tie-ins to fin-de-siècle Vienna. The first part of the edited volume will introduce the Vivarium as a new research institution in Austria, delineate the Jewish topography of the families of Przibram, Portheim, and Figdor (among some others), positioning them inside the Viennese culture and bourgeoisie, and trace how the scientific community of the university and the academy acted towards them. The following main part, elaborating the Vivarium's research program of experimental and theoretical biology, will display the experimental work of the departments dealing with developmental physiology, classical genetics/heredity, botany and plant physiology, and medical physiology/endocrinology, without neglecting the role of the women scientists and including also a chapter on the impact theoretical biology had on the experimental research at the Vivarium. The third part presents the architecture of the building and its equipment, followed by a chapter discussing the collections, library, and museum. The final part will discuss the international exchange programs, will compare the Vivarium with international research institutes (e.g., Cambridge, Agram, Lunz, Monaco, Moscow, Philadelphia, Rome), and university institutes working on similar problems.

Robert MAIER
(October 2011)

Robert Maier is a professor emeritus and senior researcher in the Department of Interdisciplinary Social Science, Utrecht University. He holds a PhD from the Université de Genève. He has been a special professor for 'Theory of Argumentation in Relation With Social Dynamics' and a faculty professor at the Faculty of Social Sciences, Utrecht University.

Outline of a Theory and Model of Ontogenetic and Historical Knowledge Development as a Revision of Piaget's Theory

Piaget has formulated a theory of knowledge construction. This theory postulates a direct or inversed isomorphism between ontogenetic and historical knowledge construction, and works with a unified theory and model of knowledge construction. Piaget advocated a general epistemic subject, using equilibration as the main mechanism of construction, based on biological theory (embryology, elements of neo-Darwinism).

The identification of ontogenetic and historical knowledge construction cannot be defended any longer, because quite different mechanisms and factors of knowledge construction are at work in both cases. For example, ontogenetic knowledge construction takes place within the particular contexts of the family, peers, school, and a social context, whereas historical knowledge construction takes place in a variable historical context with varying influences of political, economic, and intellectual fields, and variable forms of collaboration, competition, exchange, and production. It is realized by groups of adults who intentionally attempt to optimize parts of the representations of their environment according to historically variable criteria. For example, there are varying forms of financial support of knowledge construction, and distinct forms of knowledge appropriation and distribution in historical forms of knowledge production.

Therefore, it seems necessary to differentiate the theory of Piaget, and to elaborate distinct versions of ontogenetic and historical knowledge construction, with partly quite different mechanisms at work, using also other elements of biological theory.

This project will provide an outline of these two theories and models of knowledge construction, and specify the links between them.

Denis WALSH
(November 2011)

Denis Walsh is Canada Research Chair in the Philosophy of Biology. He is a member of the Department of Philosophy, Institute for the History and Philosophy of Science and Technology, and the Department of Ecology and Evolutionary Biology at the University of Toronto. He obtained a PhD in Biology at McGill University on the systematics of amphibians and a PhD in Philosophy at Kings College, London, on modal logic and modal metaphysics. He is currently doing research on the modes of explanation in evolutionary biology.

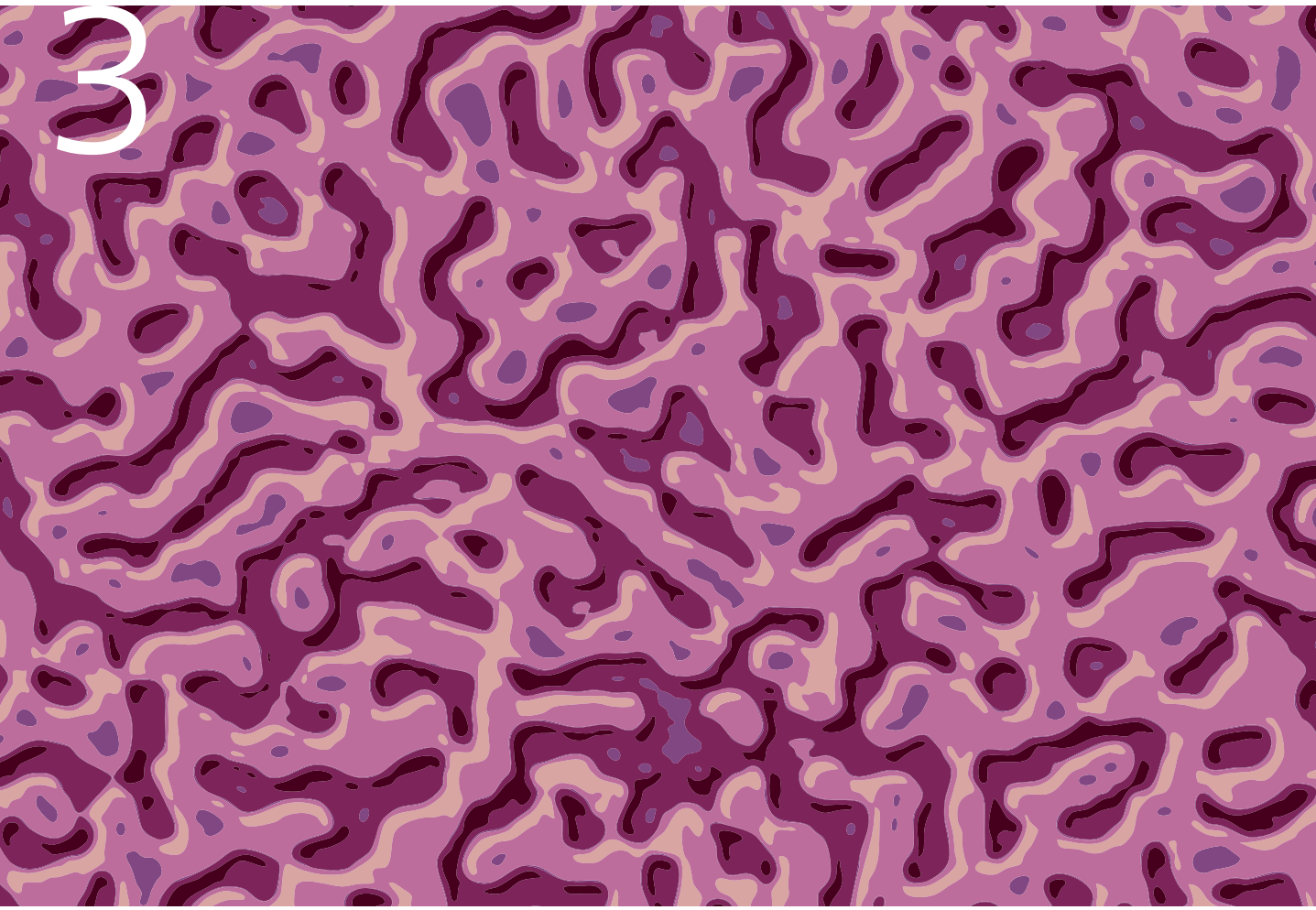
The Place of the Organism in Evolutionary Biology

There could be no more obvious a truism than that biology is the study of living things—organisms. And yet, there is a strong sense in which modern evolutionary biology is not about organisms at all. Our current best theory of evolution deals in supra-organismal assemblages (populations) of sub-organismal entities (genes or replicators). Indeed, in the 150 years since the *Origin of Species* biology has been marked by two related trends, the dramatic growth in the power and breadth of evolutionary thinking and the marginalization of organisms. This latter trend has been celebrated by some, lamented by a few, but, remarkably, overlooked by most. The reasons for the loss of organisms are varied and complex; they are empirical, historical, and philosophical. The book I am writing explores them and it outlines an alternative conception of evolutionary biology in which organisms play an ineliminable explanatory role. These issues are only now beginning to attract interest in both evolutionary biology and philosophy; so my book will constitute a timely introduction to a vibrant, growing debate.

While the book's objective is specific, its brief is broad. It draws from the history of organismal biology from ancient

to modern times, empirical issues in evolutionary biology, population genetics and developmental biology and systems theory. It deploys these empirical considerations in addressing the philosophical foundations of evolutionary biology.
The book will appeal to philosophers of biology and philosophers of science in general, as well as to evolutionary biologists. Every effort will be made to make the difficult technical material accessible to students of both the sciences and the humanities.

Meetings and Lectures



The KLI supports international workshops, symposia, lecture series, and individual talks that are organized either by the KLI or in cooperation with other institutions.

3.1 Altenberg Workshops in Theoretical Biology

The 'Altenberg Workshops' address key questions of biological theories. Each workshop is organized by leading experts of a certain field who invite a group of international specialists to the KLI. The resulting books are published by The MIT Press in the 'Vienna Series in Theoretical Biology'. The Altenberg Workshops aim to make conceptual progress and to generate initiatives of a distinctly interdisciplinary nature. Further information concerning the participants and their presentations can be found on the KLI website.

25th Altenberg Workshop in Theoretical Biology 30 June – 3 July 2011

The Meaning of 'Theory' in Biology

Organization: Massimo Pigliucci, Kim Sterelny, and Werner Callebaut

Topic and aims

This workshop deals with the meaning of ´theory´ in biology as seen from the different points of view of philosophers, theoretical biologists, and empirical scientists. Historically, philosophers have always been interested in how scientists formulate and deploy the theoretical concepts that both guide and are molded by empirical research (Lyons 2003). Evolutionary theory in particular has been the focus of attention ever since Popper's famous misunderstanding of it, followed by a less well known but significant recantation of his original views (Popper 1978). Today´s philosophical analyses of evolution are better informed than Popper's and delve into much more scientific detail, to the point of often being indistinguishable from theoretical biology proper (Okasha 2005; Pigliucci and Kaplan 2006; Walsh 2007).

Scientists, on the other hand, have been generally rather disinterested in, and in some instances even downright contemptuous of, philosophical contributions to science, as in the case of physicist Steven Weinberg's essay, ´Against Philosophy´ (in Weinberg 1992). However, there have been exceptions, particularly among biologists interested in areas such as species concepts, phylogenetics, and the limits of evolutionary science in general (Lewontin 1963, 2000; Pigliucci 2003). This relatively small group of scientists keen on cross-talk with philos-

ophers has managed to maintain a tenuous but consistent bridge between the two disciplines and modes of inquiry, particularly in the case of individuals like Richard Lewontin, who quickly came to be highly respected in both fields.

More recently, a small but increasing number of philosophers and scientists have articulated or simply started to practice an approach that has been referred to as ´the continuation of science by other means´ (Chang 2004) or, informally, ´sci-phi´ (Pigliucci 2008). In this borderland between philosophy and science, scientists engage in conceptual meta-analyses that resemble philosophical work, while philosophers write papers that are close in nature to theoretical science papers. Moreover, an increasing number of scientists and philosophers have began to publish together not only in philosophy journals (a practice that has a long history in the field) but also in scientific ones (Pigliucci and Kaplan 2000; Laland et al. 2006; Glass and Hall 2008).

The workshop aims at gathering a number of philosophers and biologists interested in the structure, foundations, and practice of biological theorizing in a broad range of fields, with an emphasis on organismal biology (ecology and evolutionary biology). Topics that include but are not confined to the meaning and deployment of mathematical modeling in the biological sciences are explored, the limits and potential of theoretical approaches and how they relate to empirical research, the social impact of biological theories, and the politics of theorizing in science. In particular, a focus on the aforementioned theme of the development in the life sciences of the disciplinary hybrid of theoretical reflection is set. The question of of whether ´theory´ means something distinctive for the life sciences, and whether theory plays a role in biology that somehow contrasts with its role in other sciences is raised.

The overall idea of this workshop is to acknowledge that the two fields have independent histories and agendas that ought to be respected in their own right: broadly speaking, science's aim is not to replace philosophy, nor is it philosophy's goal to help science solve scientific problems. However, there is a suitable ground for reciprocal intellectual fertilization that can benefit from the different know-hows and intellectual approaches typical of scientists and philosophers. Broadly speaking, this workshop aims at a better understanding of what it means to do ´theory´ in science, and in particular in biology.

MASSIMO PIGLIUCCI
City University of New York
On the Different Ways of 'Doing Theory' in Biology

ROBERTA MILLSTEIN
University of California Davis
Exploring the Status of Population Genetics: The Role of Ecology

JAMES COLLINS
Arizona State University
Natural Selection and Ecological Theory

CAROL E. CLELAND
University of Colorado
Is a General Theory of Life Possible? Understanding the Origins and Nature of Life in the Context of a Single Example

SABINA LEONELLI
Egenis, University of Exeter
Classificatory Theory in Biology

LOUIS J. GROSS
National Institute for Mathematical and Biological Synthesis and
University of Tennessee
Selective Ignorance and Multiple Scales in Biology: Deciding on Criteria for Model Utility

ALAN LOVE
University of Minnesota
Theory Is as Theory Does…

MARION VORMS
Institut d'Histoire et de Philosophie des Sciences et Techniques, Paris
Theorizing and Representational Practices in Classical Genetics

PETER HAMMERSTEIN
Humboldt-Universität zu Berlin
Risking Deeper Integration: The Role of Theory in Biology

JAMES GRIESEMER
University of California Davis
A Model of Theories in the Inexact Sciences

JOAN ROUGHGARDEN
Stanford University
Theory in Trouble: The Evolution of Social Behavior

KIM STERELNY
Australian National University and Victoria University of Wellington
Co-operation in Complex Society

JONATHAN KAPLAN
Oregon State University
From "Theory" to Social Impact and Back Again: Measures of Genetic Diversity and the Meanings of Race

HELEN LONGINO
Stanford University
Behavioral Sciences in the World

DAVID DEPEW
University of Iowa
The Rhetoric of Evolutionary Theory

WERNER CALLEBAUT
KLI and Department of Theoretical Biology, University of Vienna
Beyond a Theory of Biological Theories

26th Altenberg Workshop in Theoretical Biology 1 – 4 September 2011

Strategic Interaction in Humans and Other Animals

Organization: Simon Huttegger and Brian Skyrms

Topic and aims

Game theory has been and continues to be applied successfully by economists, biologists, and philosophers to a large number of diverse problems that can all

be cast in terms of strategic interactions. These applications have in turn affected the development of game theory itself. A notable example of this is the use of game theoretic methods by John Maynard Smith in evolutionary biology, which inspired the field of evolutionary game theory, resulting in new solution concepts and the application of dynamical systems to games. Thus, by being applied to evolutionary biology the foundations and methods of game theory have been reshaped themselves.

More recently, game theory has also been tested in the laboratory with human subjects. There are continuing debates on how experimental findings should be interpreted and whether or to what extent the predictions of traditional game theory fail in the laboratory. There are also many connections between experimental game theory and the methods of evolutionary game theory because of the importance of learning in games that, in the abstract, lead to dynamical models that may often be viewed in terms of individual learning and in terms of population processes.

The workshop aims at gathering biologists, economists, mathematicians, and philosophers who share an interest in game theory. Some of the topics that will be explored concern applications of game theory; others will be about its conceptual foundations when viewed in terms of evolutionary or learning processes. We do not aim at surveying the field. Instead, we hope that some particularly significant issues will be presented, illustrating the richness of the applications and foundations of game theory, and its relevance for the social and the life sciences.

KEVIN ZOLLMAN (joint work with SIMON HUTTEGGER)
Carnegie Mellon University
Concerns and Alternatives to Costly Signaling in Biology

ULRICH BERGER
Learning To Trust

TED BERGSTROM
University of California, Santa Barbara
Evolution of Utility Functions for Socially Connected Individuals

ARTHUR ROBSON (joint work with NICK KASIMATIS and DANIEL MONTE)
Simon Fraser University
The Evolution of the Theory of Mind

PETER HAMMERSTEIN
Humboldt-Universität zu Berlin
The Role of Learning and Emotions in Game Theory

42 LARRY BLUME (joint work with DAVID EASLEY, JOHN KLEINBERG, ROBERT KLEINBERG, and EVA TARDOS)
Cornell University
Network Formation in the Presence of Contagious Risk

ROSS CRESSMAN
Wilfried Laurier University
Game Experiments on Cooperation through Reward and Punishment

JOSEF HOFBAUER
University of Vienna
Game Dynamics: Discrete Versus Continuous Time

BILL SANDHOLM (joint work with DAISUKE OYAMA and OLIVIER TERCIEUX)
University of Wisconsin
Sampling Best Response Dynamics and Deterministic Equilibrium Selection

RAINER HEGSELMANN
University of Bayreuth
The Evolution of Division of Labor and Morality – A Computer Simulation of Hume´s Theory

SAMIR OKASHA
University of Bristol
Veil of Ignorance Arguments in Philosophy, Economics, and Evolutionary Biology: Mendel meets Rawls and Harsanyi

27th Altenberg Workshop in Theoretical Biology
22 – 25 September 2011

Cultural Niche Construction

Organization: Kevin Laland and Michael O'Brien

Topic and aims

Niche construction theory (NCT) is a relatively new development within evolutionary biology, but one that has important implications for many adjacent fields of research, including the human sciences. NCT places emphasis on the capacity of organisms to modify natural selection in their environment and thereby act as co-directors of their own and other species' evolution. Examples of niche construction include animals manufacturing nests, burrows, webs, and pupal cases; plants changing levels of atmospheric gases and modifying nutrient cycles; fungi decomposing organic matter; and bacteria fixing nutrients. Organisms also construct and destroy resources and habitat utilized by other species in their environments ('ecosystem engineering'). These interactions connect diverse organisms and create 'engineering control webs' and 'eco-evolutionary feedbacks' that potentially greatly affect the stability of ecosystems.

While niche construction is a general process, human niche construction may be uniquely potent among that of all species. In the last 100,000 years, humans have dispersed from East Africa around the globe and exhibited massive population growth. This success story would have been impossible without their ability to modify environments to compensate for different climatic regimes and other challenges — manufacturing clothes and shelters, controlling fire, devising agricultural practices, and domesticating livestock. Recent genetic analyses strongly suggest that human cultural activities have triggered selective sweeps of alleles newly favored in these constructed environments, thereby substantially shaping the human genome. Humans have become adapted to a cultural niche. At the same time, human cultural activities have created new niches for other species, such as domesticates and commensals, whilst destroying countless others by eroding engineering control webs.

The basis for human success as a species is the inordinately high capacity for learning that its members possess. The significance of acquired characters to evolutionary processes becomes amplified with transgenerational culture, creating

what anthropologists refer to as 'traditions' — patterned ways of doing things that exist in identifiable form over extended periods of time. When humans engage in niche construction, they thereby modify the learning environments for themselves and others in their population, scaffolding innovation and channeling development along particular pathways. Through their activities humans construct not only an ecological niche but also a developmental niche, an aspect of NCT that remains under-explored.

As of yet, the developing interest in human niche construction may seem akin to a ripple within the human sciences as a whole, but there is growing evidence of a multidisciplinary initiative that includes fields such as philosophy, primatology, psychology, evolutionary anthropology, and demography. In any one discipline, the impact of NCT may still yet be modest, but across them collectively, it is starting to become a powerful movement.

Eric PALKOVACS
Duke University
Eco-evolutionary Feedbacks in a Human-Dominated World

Kim CUDDINGTON
University of Waterloo
Modeling the Population Consequences of Ecosytem Engineering

Sean MYLES
Cornell University
The Past and the Future of Human-mediated Genetic Change

Magdalena HURTADO & Kim HILL
Arizona State University
Ground Truthing Three Pillars of Human Uniqueness: Collective Action, Public Health, and Longevity

Jessica FLACK
Santa Fe Institute
Social Niche Construction through Collective Computation Topic and Aims

Russell GRAY
University of Auckland
Tool Manufacture, Niche Construction, and the Evolutionary Role of Template Matching

Dorothy FRAGASZY
University of Georgia
Using Niche Construction Theory to Understand how Nonhuman Primates Maintain Technical Traditions and to Predict their Distribution

Jeremy KENDAL
Durham University
Niche Construction Theory in the Social Sciences: The Role of the Constructed Learning Environment

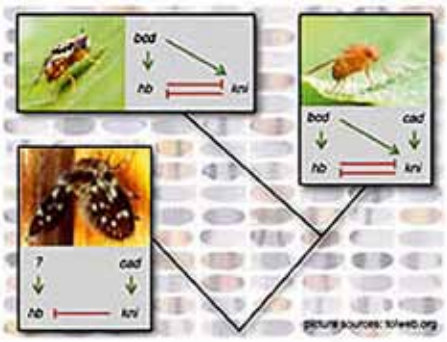
Michael J. O'BRIEN
University of Missouri
Kevin LALAND
University of St. Andrews
Niche Construction Theory and the Human Sciences: Developing a Practical Theoretical Framework

Bruce D. SMITH
Smithsonian Institution
A Resource-catchment-scale General Model of the Role of Niche Construction in Agricultural Origins

Mark COLLARD
Simon Fraser University
University of Missouri
Briggs BUCHANAN
Simon Fraser University
University of Missouri
April RUTTLE
Simon Fraser University
Michael O'BRIEN
University of Missouri
Niche Construction, Risk, and Technology in Small-scale Societies

Mirna KOVACEVIC
Stephen SHENNAN
Mark G. THOMAS (presenting author)
University College London
Modeling the Spread of Aurignacian Material Culture: Were the First Modern Humans in Europe Ethno-linguistically Structured?

3.2 Summer School



2nd Summer School on Evolutionary Developmental Biology 19 – 22 September 2011

From Gene Networks to Organismal Systems

Istituto Veneto di Scienze, Lettere ed Arti, Venice
Organization: Alessandro Minelli, Michael Akam, Gerd B. Müller and Giuseppe Fusco

Topic and aims

Evolutionary developmental biology (EvoDevo) faces a number of significant theoretical and empirical challenges, as it is moving beyond qualitative comparative analyses of gene expression and key regulatory factors, and begins to focus on quantitative, systems-level studies of evolving developmental processes. This course will expose its participants to these challenges, with the aim of providing PhD students and post-docs with a basic conceptual and methodological toolkit to approach current EvoDevo questions.

The course is centered around the complex relationship between genotype and phenotype. It will start with an introduction on the history and current status of EvoDevo, and an outline of an extended synthesis for evolutionary biology. We will introduce problems of phylogenetics, and the choice of model organisms as a necessary practical prerequisite for any investigation into EvoDevo. We will then cover different approaches to the study of evolution at the phenotypic level: comparative embryology/morphology, the principles of cis-regulatory evolution and its consequences on organismic form, the role of physical factors as well as cell interaction and gene networks in constraining and shaping evolutionary processes, and the influence of the environment. This will include discussions of central concepts such as evolvability, robustness, and phenotypic plasticity and their respective roles in evolution.

GERD B. MÜLLER
University of Vienna and KLI
EvoDevo and the Extended Synthesis in Evolutionary Theory

RONALD JENNER
Natural History Museum, London
Tree-thinking: from Character Evolution to Model Organism Choice

ANDREAS HEJNOL
Sars International Center for Marine Molecular Biology, Bergen
Comparative Developmental Biology and the Evolution of Animal Organ Systems

GRAHAM BUDD
University of Uppsala
Origin and Evolution of Morphological Characters

PATRICIA BELDADE
Gulbenkian Institute, Lisbon
Cis-regulatory Evolution and Pattern Formation

JOHANNES JAEGER
Center for Genomic Regulation – CRG, Barcelona
The Evolution of Developmental Gene Regulatory Networks

STUART A. NEWMAN
New York Medical College
The Role of Physics in the Origination and Development of Biological Form

CHRISTIAN BRAENDLE
CNRS and University of Nice – Sophia Antipolis
Environment, Evolution and the Genotype-phenotype Map

3.3 Cooperative Events

Conference
20 – 21 June 2011

Making Sense of Large Datasets: Perspectives Across the Sciences

University of Exeter
Organization: Sabina Leonelli

SABINA LEONELLI
ESRC Centre for Genomics in Society (Egenis), University of Exeter
Making Sense of Large Datasets

PAUL SCHOFIELD
University of Cambridge
Sharing and Caring; Data integration in International Large-scale Mouse Functional Genomics

MURRAY GRANT
University of Exeter
Enumerate and Exposed! Drifting out of the Comfort Zone for the Research Pound

JESSIE KENNEDY
Napier University, Edinburgh
Integrating Diverse Sources of Scientific Data: Is it Safe to Match on Names?

ALBERTO CAMBROSIO
McGill University, Montreal
Patient Samples, Data, Evidence and Utility: Resource Management in Biomedicine

ALISON WYLIE
University of Washington, Seattle
Mixed Masses of Data: Evidential Reasoning in Archeology

WENDY PARKER
Ohio University, Athens
Some Challenges of Climate 'Data'

KAREN S. BAKER
University of California, San Diego
Growing Infrastructures for Data Use: An Ecological Site-Network Information

PANEL DISCUSSION
Making Sense of Data – Philosophical Perspectives
JOHN DUPRÉ, ESRC Centre for Genomics in Society (Egenis), University of Exeter
RACHEL ANKENY, University of Adelaide
STAFFAN MUELLER-WILLE, University of Exeter
WERNER CALLEBAUT, KLI
ANNAMARIA CARUSI, Oxford
SABINA LEONELLI, ESRC Centre for Genomics in Society (Egenis), University of Exeter

Workshop
7 – 9 September 2011

Natural Kinds in Philosophy and in the Life Sciences: Scholastic Twilight or New Dawn?

University of Granada
Organization: María José Frápolli, Miles MacLeod, Thomas A.C. Reydon

Topic and aims

This workshop will be devoted to exploring the future of the 'natural kinds' concept in the philosophy of the life sciences (broadly conceived) and in scientific practice in this area of science, partly in comparison with the concept in other areas of science. In a recent paper, Ian Hacking claimed that the notion of 'natural kinds' has outlived its use, that it stands in the way of progress in both philosophy of science and the sciences themselves, and that it should therefore be disposed of (Hacking, 2007, ´Natural kinds: rosy dawn, scholastic twilight').

According to Hacking, there is no such thing as a natural kind and, therefore, it doesn't make much sense for philosophers of science and scientists to frame their work in terms of the concept of 'natural kinds.' The aim of this workshop is to explore which responses philosophers and scientists might give to Hacking´s claims.

There are good reasons to think such responses can be given. Hacking is principally concerned with essentialist conceptions of natural kinds and the metaphysical presuppositions of natural kinds philosophy, which are admittedly of limited use in most sciences. However, these are post hoc assessments of natural kinds concepts and seem at the very least presumptive of what counts as 'natural.' In contrast, the concept of 'natural kind' seems to be moving away from these issues towards the fashioning of a concept that models important differences in the categories researchers construct in practice, in the process of that construction, and subsequently in the epistemic roles these categories play and how they are productively relied upon to further research (in all these contexts distinct from what may be labeled 'artificial' kinds). Natural kinds are less a label philosophically applied to particular products of research than to important elements of the process of research itself. In light of this the leading questions of the workshop are: Is Hacking really right in his general claim that there is no use for the concept of 'natural kind' in either philosophy of science or science itself, or is there rather a significant aspect of the practices of categorization in the context of research to be captured by the notion of a natural category? If the latter, what philosophical work does the concept do? And how do scientists themselves think about their categories?

Since the main questions of this workshop concern research practices, and the productive application of a philosophical concept to them, one of the chief ambitions is to bring active researchers and philosophers into dialogue. We intend to address and discuss the meaningfulness of the natural kind concept both to philosophers of science and to scientists themselves. Participants from both sides of the division are asked to address this issue from the perspective of their own field of work, building their presentation and paper around the following questions:

– Do you recognize distinctions between types of categories in your field of work (or in the field you study as a philosopher) pertaining to their naturalness?
– What do you consider the natural kind categories of this field or the reasons whether the category makes (or doesn´t make) sense?
– What would you consider the basis and meaning of 'your' natural kinds, and how would you distinguish them from non-natural kinds?

– What might be the importance to the field of making such a categorical distinction? In particular, what epistemic work does the notion of 'natural kind' do in the field?
– And related, what kind of difference does the label 'natural kind' reflect in terms of the use of such a concept in your research practice?

The principal result of this workshop should be a general overview of whether or not scientists from the domains of the life and cognitive sciences, and philosophers looking at these sciences, tend to agree with Hacking´s claim about the concept of 'natural kind' – and if they tend not to agree with Hacking, wherein in their view the usefulness of the 'natural kind' concept lies.

Towards answering this question the workshop plans to bring together scientists and philosophers who work particularly in philosophy of the life sciences and discuss how a concept of natural kinds allows facilitates a comparison of grouping and categorization practices across science.

HELEN BEEBEE
University of Birmingham
How to Carve Nature Across the Joints without Abandoning Kripke-Putnam Semantics

STAVROS ASSIMAKOPOULOS
Universidad de Granada
Natural Kinds and Natural Kind Terms

JOSÉ L. FALGUERA
Universidad de Santiago de Compostela
LUIS VILLEGAS-FORERO
Universidad de Santiago de Compostela
Natural Kinds versus Constituted Kinds in Science and Zalta's Abstract Objects

ANN-SOPHIE BARWICH
University of Exeter
Natural Kind Terms as Sign Functions

MANUEL DE PINEDO
Universidad de Granada
Biology-inspired Natural Kinds

JUAN J. ACERO
Universidad de Granada
JOSÉ MANUEL PALMA
Universidad de Granada
Emotion, Perception and Natural Kinds

MARION GODMAN
Kings College London
Two Models of Grounding Natural Kinds in the Case of Psychiatry

LISA GANNETT
Saint Mary´s University
Projectability and Group Concepts in Population Genetics and Genomics

KURT SCHWENK
University of Connecticut
Natural Kinds in Functional and Evolutionary Morphology

PEDRO J. SÁNCHEZ
Universidad Complutense de Madrid
Semiotic versus Ontological Naturalness

MILES MACLEOD
KLI
Limitations of Natural Kind Talk for Understanding Scientific Practice in the Life Sciences: Homology and other Cases

JESSICA BOLKER
University of New Hampshire
Natural Kinds in Evolutionary/Developmental Biology

ANTONIO DIÉGUEZ
Universidad de Málaga
Is Life a Natural Kind?

MATTHEW H. SLATER
Bucknell University
Deep and Superficial Similarity amongst Cellular Kinds

ALBA AMILIBURU
University of the Basque Country (UPV/EHU)
Beyond Semantics: Stipulation and Essentialism Regarding Natural Kinds

ARANTZA ETXEBERRÍA
University of the Basque Country (UPV/EHU)
HPC Kinds and Biological Individuals

OLIVIER RIEPPEL
The Field Museum, Chicago
Species, History and Identity: Construing Kinds without Essences

XAVIER DE DONATO
Universidad de Santiago de Compostela
ALFONSO ARROYO-SANTOS
Universidad Nacional Autónoma de México
Natural Kinds of Freaks of Nature in Biological Taxonomy: The Case of Phylogenetics

MARÍA CEREZO
Universidad de Murcia
ELSA MURO
Universidad de Navarra
Issues on Identity and Change in Biological Species

Tagung 'Unter Wasser'
10 – 11 November 2011
IFK, Vienna

Unter Wasser: Lebensformen zwischen Ozean, Aquarium und Computer

Organization: IFK (Internationales Forschungszentrum Kulturwissenschaften) and KLI

Topic and aims

Das zur Mitte des 19. Jahrhunderts formulierte Ziel, dem 'schweigenden Ozean eine Antwort abzunöthigen', die Aufschluss über die bis dato weitgehend unbekannten Lebensformen des Meeres geben könnte, stellte die Naturforscher vor ungeahnte Herausforderungen. Wie sollte es gelingen, die Forschungsobjekte verfügbar zu machen? Wie konnte man sie in Laboratorien und zoologische Stationen überführen und wie mussten die dortigen experimentellen Umgebungen beschaffen sein, die es erlaubten, Wissen über das Leben im Meer zu etablieren?

Der 1862 formulierte sehnsuchtsvolle Ausruf eines Gelehrten – 'Wenn es uns doch vergönnt wäre, ebenso frei auf jenen unterseeischen Gefilden, als auf der festen Erde umherzuwandeln; oder wenn unser Auge mit eben der Leichtigkeit durch die klaren Salzfluthen dringen könnte wie durch die Räume des atmosphärischen Ozeans!' weist bereits darauf hin, dass sich die Erforschung der Meere immer auch als Medienproblem darstellt. Im Rahmen dieser Tagung wird daher nicht nur nach der Entwicklung ozeanografischer Instrumente, Apparaturen und Aufzeichnungsverfahren gefragt, mit deren Hilfe der Ozean im Ozean selbst erkundet werden kann, sondern vor allem nach den Prozeduren der Überführung des Meeres in andere Räume, die seiner Erforschung dienen. Ist das Tier im Aquarium, wie Vermittler naturgeschichtlichen Wissens im späten 19. Jahrhundert lapidar feststellten, tatsächlich 'ganz genau das, was es im Freien ist'? Während in den zoologischen Gärten als Todesursache der dort ausgestellten Tiere noch bis weit ins 20. Jahrhundert 'Heimweh' angegeben wurde – eben weil die Lebewesen dort in ihren vergitterten Gehegen ihre natürliche Umgebung schmerzlich vermissten – waren die Meeresbewohner stets zu Hause, so ein Topos in zeitgenössischen Handbüchern der Meereskunde. Denn eingefangen, an

die Oberfläche gebracht und tausende Kilometer verschickt würden nicht nur lebende Individuen, sondern mit ihnen ein ganzes Milieu. Wie jedoch ist dieses Milieu zu denken und in welche Beziehungen tritt es im Zuge seiner Verlegung in andere Nachbarschaften? Und wie verändern sich diese Umgebungen mit der Entwicklung neuer technischer Apparaturen und Medien zur Durchmusterung und Modellierung aquatischer Wissensräume in der modernen Meeresbiologie?

HELEN M. ROZWADOSKI
Fathoming the Real and Imagined Nineteenth-Century Ocean

ISABEL KRANZ
Gruß vom Meeresgrunde.
Postalische Sendungen aus den Tiefen des Ozeans

VINCENT JANIK
Exploring the 'Silent World':
Research on Cetacean Communication and Cognition

KATHERINE ANDERSON
Field Photography and Underwater Artists:
Media and Methods in the Ocean in the 1920s & 1930s

FLORIAN HUBER
Modell und Milieu am Beispiel Leopold Blaschka

ARIANE TANNER
Plankton: 'They Quickly Die and Fade'

JAN MÜGGENBURG
Speak for fish–Mensch, Delfin und Computer im Sommer 1965

SEBASTIAN VEHLKEN
Schallbilder. Acoustic Visualization im Ozean

JENS KRAUSE
Methodological Approaches for the Study
of the Social Organization of Aquatic Vertebrates

3.4 Brown Bag Discussions

'Brown bag' refers to the informal format of these public talks: bring your lunch, sit back, enjoy the talk, and join in the discussion! The 'Brown Bag Discussions' take place at lunch time in the library of the KLI in Altenberg. Abstracts of the presentations and information about the lecturers can be found at the website of the institute.

C. KENNETH WATERS
University of Minnesota, Minneapolis
Chanciness, Robustness, and Historical Contingency in Evolutionary Theorizing: What Does it Mean to Say that Evolution is Historically Contingent?

AIDA GÓMEZ-ROBLES
Burgos University,
***In silico* Evolution of Hominin Dental Morphology**

LAURA NUÑO DE LA ROSA GARCÍA
KLI
Becoming Organisms: Recovering the Aristotelian Distinction Between Being in Potency and Being in Actuality in the Light of Contemporary Developmental Biology

RACHAEL BROWN
KLI
Reconceiving Evolvability -- A Novel Analysis Using Conditional Probability

EHAB ABOUHEIF
McGill University, Montreal, & KLI
The Theory of Mesoevolution

ANDREAS DE BLOCK
University of Leuven
BART DU LAING
Ghent University
Amusing Ourselves to Death? Superstimuli and the Evolutionary Social Sciences

WAYNE CHRISTENSEN
KLI
A Systems Approach to the Evolution of Cognition

EHAB ABOUHEIF
McGill University, Montreal, & KLI
Genes in Context: Tales from the World of Ants and Water Striders

BRETT CALCOTT
KLI
Evolving Modularity via Plasticity

LUC CIOMPI
Belmont-sur-Lausanne
Macrosocial Effects of Collective Emotions

AIDAN LYON
University of Maryland, College Park
Why Normal Distributions are Normal

THOMAS FLATT
Veterinary University of Vienna
What Mechanistic Insights Can or Cannot Contribute to Life History Theory

NAOMI BECK
KLI
***Homo Mercans* (Market Man)**

DAVIDE VECCHI
USACH, Santiago
New Metaphors for the Study of Culture

DOMENIC BERDUCCI
Toyama University, & KLI
From Infants´ Reacting to Understanding

ELIAS KHALIL
Monash University, Clayton
Biological Tools and Manufactured Tools as Encapsulated Routines

SZABOLCS SZÁMADÓ
Eötvös Loránd University, Budapest
The Cost of Honesty

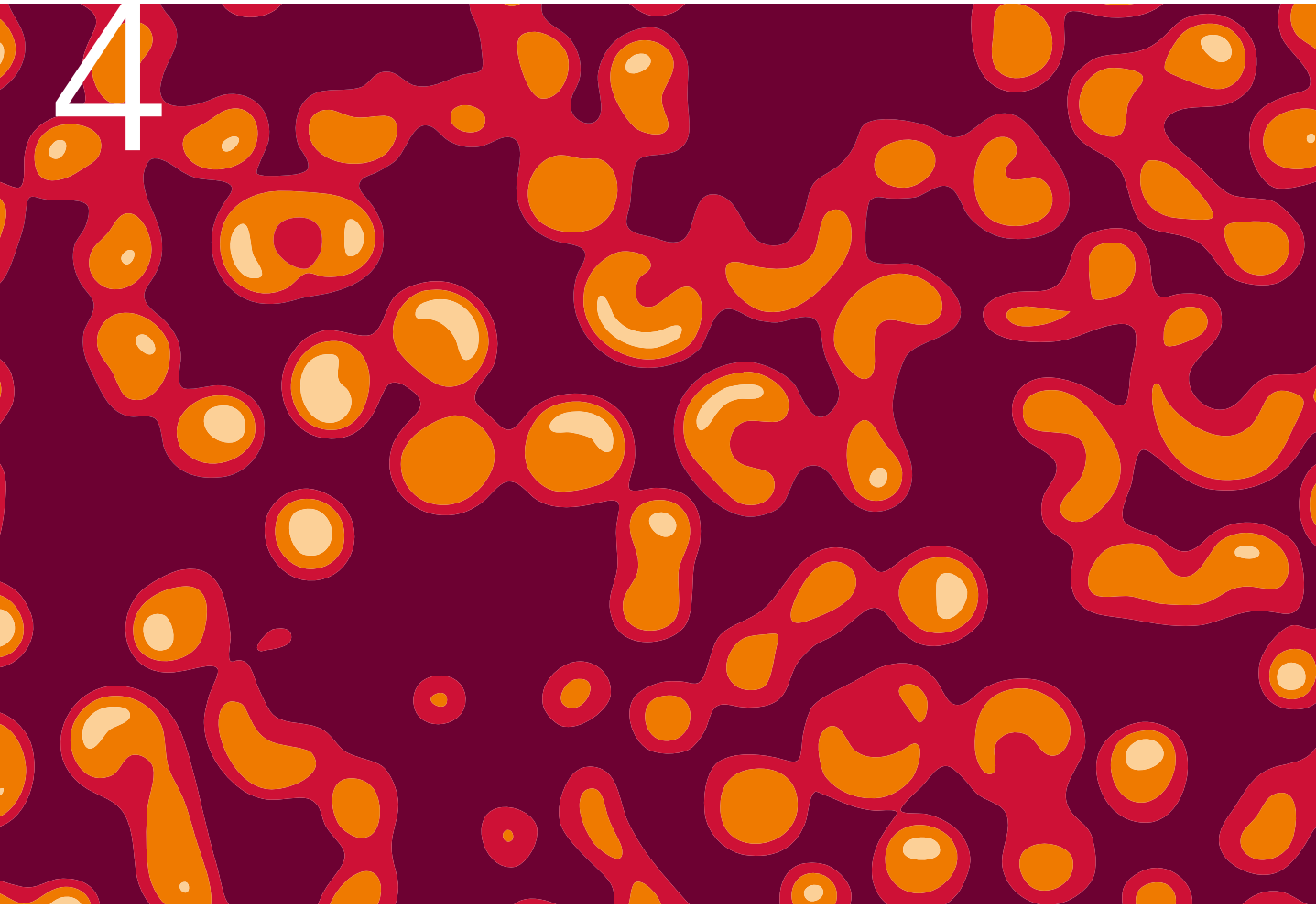
DENIS WALSH
University of Toronto, & KLI
Mechanism, Emergence, and Miscibility: The Autonomy of Organism

KATALIN STRANER
Central European University, Budapest
Darwinism, Translation, and the Hungarian Scientific Community in the 19th Century

MIHAELA PAVLICEV
University of Vienna
A Model of Developmental Evolution: Selection, Pleiotropy, Compensation

Publications

4



Scientific publications and presentations of fellows and staff members of the KLI in 2011.

4.1 Vienna Series in Theoretical Biology

The 'Vienna Series' is published by The MIT Press as a book series. Books are mainly based on the Altenberg Workshops and the resulting contributions and new syntheses. The book projects are subjected to a reviewing process by The MIT Press.

Volume 13:

CALCOTT B, STERELNY K, eds.
The Major Transitions in Evolution Revisited

Volume 14:

GISSIS SN, JABLONKA E, eds.
Transformations of Lamarckism
From Subtle Fluids to Molecular Biology

Volume 15:

McGHEE G.
Convergent Evolution
Limited Forms Most Beautiful

4.2 Professional Papers

ANFORA G, RIGOSI E, FRASNELLI E, RUGA V, TRONA F, VALLORTIGARA G.
Lateralization in the Invertebrate Brain: Left-right Asymmetry of Olfaction in Bumble Bee, *Bombus terrestris*.
PLoS ONE 6: e18903.

BERDUCCI D.
This is Learning.
Pragmatics & Cognition 19: 476-506.

BERMÚDEZ DE CASTRO JM, MARTINÓN-TORRES M, GÓMEZ-ROBLES A, PRADO-SIMÓN L, MARTIN-FRANCÉS L, LAPRESA M, OLEJNICZAK AJ.
Early Pleistocene Human Mandible from Sima del Elefante (TE) Cave Site in Sierra de Atapuerca (Spain): A Comparative Morphological Study.
Journal of Human Evolution 61: 12-25.

BRAUCKMANN S.
Cultures of Seeing Embryos and Cells in 3-Dimensions and Flatness.
Studies in History and Philosophy of Biological and Biomedical Sciences 42: 365-367.

BRAUCKMANN S.
Axes, Planes and Tubes, or the Geometry of Embryogenesis.
Studies in History and Philosophy of Biological and Biomedical Sciences 42: 381-390.

CLARKE E.
Plant Individuality and Multilevel Selection Theory.
In: The Major Transitions Revisited (Sterelny K, Calcott B, eds), 227-251
Cambridge, MA: MIT Press.

FRASNELLI E, VALLORTIGARA G, ROGERS LJ.
Origins of Brain Asymmetry: Lateralization of Odour Memory Recall in Primitive Australian Stingless Bees.
Behavioural Brain Research 224: 121-127.

GÓMEZ-ROBLES A, MARTINÓN-TORRES M, BERMÚDEZ DE CASTRO JM, PRADO-SIMÓN L, ARSUAGA JL.
A Geometric Morphometric Analysis of Hominin Upper Premolars: Shape Variation and Morphological Integration.
Journal of Human Evolution 61: 688-702.

GÓMEZ-ROBLES A, OLEJNICZAK AJ, MARTINÓN-TORRES M, PRADO-SIMÓN L, BERMÚDEZ DE CASTRO JM.
Evolutionary Novelties and Losses in Geometric Morphometrics: A Practical Approach through Hominin Molar Morphology.
Evolution 65: 1772-1790.

HAASE A, RIGOSI E, FRASNELLI E, TRONA F, TESSAROLO F, VINEGONI C, ANFORA G, VALLORTIGARA G, ANTOLINI R.
A Multimodal Approach for Tracing Lateralization along the Olfactory Pathway in the Honeybee through Electrophysiological Recordings, Morpho-functional Imaging, and Behavioural Studies.
European Biophysics Journal 40: 1247-1258.

KIS A, GÁCSI M, RANGE F, VIRÁNYI Z.
Object Permanence in Adult Common Marmosets (*Callithrix jacchus*): Not Everything is an 'A-not-B' Error that Seems to be One.
Animal Cognition 15: 97-105.

MATTHEWSON J, CALCOTT B.
Mechanistic Models of Population-level Phenomena.
Biology and Philosophy 26: 737-756.

METSCHER B, MÜLLER GB.
MicroCT for Molecular Imaging: Quantitative Visualization of Complete Three-Dimensional Distributions of Gene Products in Embryonic Limbs.
Developmental Dynamics 240: 2301-2308.

MÜLLER GB.
Biography of Gerd B. Müller.
Evolution & Development 13: 243-246.

NICHOLSON DJ.
Review of 'Genesis Redux: Essays in the History and Philosophy of Artificial Life'.
Annals of Science 68: 136-139.

RIGOSI E, FRASNELLI E, VINEGONI C, ANTOLINI R, ANFORA G, VALLORTIGARA G, HAASE A.
Searching for Anatomical Correlates of Olfactory Lateralization in the Honeybee Antennal Lobes: A Morphological and Behavioural Study.
Behavioural Brain Research 221: 290-294.

ROSAS A.
Chimpanzee Social Cognition and the Phylogeny of Morals.
In: Darwin's Evolving Legacy (Martínez J, Ponce de León A, eds), 291-302
Mexico: Editorial Siglo XXI.

ROSAS A.
El proyecto de explicación darwinista del comportamiento moral.
In: Darwin y las Ciencias del Comportamiento (Gutiérrez G, Papini M, eds), 475-490.
Bogotá: Universidad Nacional de Colombia y Colegio Colombiano de Psicólogos.

ROSAS A.
Ética Evolucionista: o enfoque adaptacionista da cooperacao humana.
In: Filosofia da Biologia (Abrantes P, ed), 296-314.
Porto Alegre: Artmed Editora.

SUTTON J, McILWAIN J, CHRISTENSEN WD, GEEVES A.
Applying Intelligence to the Reflexes: Embodied Skills and Habits between Dreyfus and Descartes.
Journal of the British Society for Phenomenology 42: 78-103.

VERPOOTEN J.
Evolutie van fictie: culturele exaptatie van sociale cognitie [Evolution of Fiction: Cultural Exaptation of Social Cognition].
In: De stralende lezer, Wetenschappelijk onderzoek naar de invloed van het lezen (Hakemulder F, ed), 201-230.
Delft: Eburon, Stichting Lezen.

VERPOOTEN J.
Kunst en het evolutionaire proces: het belang van spandrels en exaptaties [Art and the Evolutionary Process: the Importance of Spandrels and Exaptations].
Deus ex Machina 137: 46-52.

VERPOOTEN J.
Why Art is not an Adaptation but nonetheless a Necessary Outcome of Evolution.
In: The Cover Mountain (Crouwers A, ed).
Demian press.

VOELKL B, KASPER C, SCHWAB C.
Network Measures for Dyadic Interactions: Stability and Reliability.
American Journal of Primatology 73: 731-740.

WAGNER J, SZIPL G, SCHWAB C.
Successfully Releasing Jackdaws, *Corvus monedula*: Spatial Dispersion and the Fusion of Social Groups.
Vogelwarte 49: 163-174.

WILHELM G, HANDSCHUH S, PLANT J, NEMESCHKAL H.
Sexual Dimorphism in Head Structures of the Weevil *Rhopalapion longirostre* (Olivier 1807) (Coleoptera: Curculionoidea): A Response to Ecological Demands of Egg Deposition.
Biological Journal of the Linnean Society 104: 642-660.

4.3 Forthcoming Publications

CALCOTT B.
Why the Proximate–Ultimate Distinction is Misleading, and Why it Matters For Understanding the Evolution of Cooperation.
In: Cooperation and its Evolution (Sterelny K, Joyce R, Calcott B, Fraser B, eds), Cambridge, MA: MIT Press.

CALLEBAUT W.
Scientific Perspectivism: A Philosopher of Science's Response to the Challenge of Big Data Biology.
Studies in History and Philosophy of Biological and Biomedical Sciences.

CHRISTENSEN WD.
Natural Sources of Normativity.
Studies in History and Philosophy of Biological and Biomedical Sciences.

CHRISTENSEN WD, SUTTON J.
Reflections on Emotion, Imagination and Moral Reasoning: Towards an Integrated, Multidisciplinary Approach to Moral Cognition.
In: Emotion, Imagination and Moral Reasoning (Langdon R, Mackenzie C, eds). London: Psychology Press.

CLARKE E.
Plant Individuality: A Solution to the Demographers Dilemma.
Biology and Philosophy.

CLARKE E.
The Multiple Realisability of Biological Individuals.
Journal of Philosophy.

CLARKE E, OKASHA S.
Species and Organisms: What are the Problems?
In: From Groups to Individuals (Bouchard F, Huneman P, eds).
Cambridge, MA: MIT Press.

FRASNELLI E, IAKOVLEV I, REZNIKOVA Z.
Asymmetry in Antennal Contacts during Trophallaxis in Ants.
Behavioural Brain Research.

FRASNELLI E, VALLORTIGARA G, ROGERS LJ.
Left-right Asymmetries of Behaviour and Nervous System in Invertebrates.
Neuroscience and Biobehavioral Reviews.

GÓMEZ-ROBLES A, POLLY PD.
Morphological Integration in the Hominin Dentition: Evolutionary, Developmental, and Functional Factors.
Evolution.

LANFEAR R, CALCOTT B, HO SY, GUINDON S.
PartitionFinder: Combined Selection of Partitioning Schemes and Substitution Models for Phylogenetic Analyses.
Molecular Biology and Evolution.

MACLEOD M.
How to Compare Homology Concepts: Class Reasoning about Evolution and Morphology in Phylogenetics and Developmental Biology.
Biological Theory.

MACLEOD M.
Rethinking Scientific Concepts for Research Contexts: The Case of the Classical Gene.
In: Scientific Concepts and Investigative Practice (Steinle F, Feest U, eds) as part of the 'Berlin studies in Knowledge Research' (Abel G, Conant J, eds).
Berlin: De Gruyter

NICHOLSON DJ.
The Concept of Mechanism in Biology.
Studies in History and Philosophy of Biological and Biomedical Sciences.

NICHOLSON DJ, MOSS L.
On Nature and Normativity: Normativity, Teleology, and Mechanisms in Biological Explanations.
Studies in History and Philosophy of Biological and Biomedical Sciences.

PAVLICEV M, WAGNER GP.
A Model of Developmental Evolution: Selection, Pleiotropy and Compensation.
Trends in Ecology and Evolution.

PRADO-SIMÓN L, MARTINÓN-TORRES M, BACA P, GÓMEZ-ROBLES A, LAPRESA M, CARBONELL E, BERMÚDEZ DE CASTRO JM.
A Morphological Study of the Tooth Roots of the Sima del Elefante Mandible (Atapuerca, Spain): A New Classification of the Teeth—Biological and Methodological Considerations.
Anthropological Science.

PRADO-SIMÓN L, MARTINÓN-TORRES M, BACA P, OLEJNICZAK AJ, GÓMEZ-ROBLES A, LAPRESA M, ARSUAGA JL, BERMÚDEZ DE CASTRO JM.
Three-dimensional Evaluation of Root Canal Morphology in Lower Second Premolars of Early and Middle Pleistocene Human Populations from Atapuerca (Burgos, Spain).
American Journal of Physical Anthropology.

RAJAKUMAR R, SAN MAURO D, DIJKSTRA MB, HUANG M H, WHEELER DE, HIUO-TIM F, KHILA A, COURNOYEA M, ABOUHEIF E.
Ancestral Developmental Potential Facilitates Parallel Evolution in Ants.
Science.

ROSAS A.
Towards a Unified Theory of Reciprocity.
Commentary to Guala, F. Reciprocity: Weak or Strong? What Punishment Experiments Do (and Do Not) Demonstrate.
Behavioral and Brain Sciences.

SCHWAB C, SWOBODA R, KOTRSCHAL K, BUGNYAR T.
Recipients Affect Prosocial and Altruistic Choices in Jackdaws, *Corvus monedula*.
PLoS ONE.

SHIFFERMAN EM.
Its all in your Head: The Role of Quantity Estimation in Sperm Competition.
Proceedings of the Royal Society Biological.

VERPOOTEN J, NELISSEN M.
Sensory Exploitation: Underestimated in the Evolution of Art as Once in Sexual Selection?
In: Philosophy of Behavioral Biology (Plaisance KS, Reydon TAC, eds)
Boston Studies in the Philosophy of Science.

VON HERVERSEN B, WILKE A, JOHNSON T, SCHMID G, KLAPP B.
Performance Benefits of Depression: Sequential Decision Making in a Healthy Sample and a Clinically Depressed Sample.
Journal of Abnormal Psychology.

4.4 Scientific Presentations

ABOUHEIF E.
Genetic Accommodation of a Novel Ant Caste Drives Evolution of the Gene Network Underlying Wing Polyphenism in Ants.
Gulbenkian Institute, Oereis, Portugal.

ABOUHEIF E.
Socio-Evo-Devo: How Development and Social Evolution Feedback on one another.
International Union for the Study of Social Insects (IUSSI), Banyuls.

ABOUHEIF E.
Repeated Evolution of a Gene Network in Sky Island Population of the Ant *Monomorium emmersoni*.
University of Innsbruck, Innsbruck.

ABOUHEIF E.
The Developmental Genetic Basis of Appendages in Ants and Water Striders: Lessons from the Field of Evolutionary Developmental Biology.
University of Jordan, Amman.

ABOUHEIF E.
Reproductive Constraint is a Developmental Mechanism that Maintains Social Harmony in Ants.
University of Veternary Medicine, Vienna.

CALLEBAUT W.
'Philosophy Meets Science.' Mei:CogSci Lecture Series.
University of Vienna.

CALLEBAUT W.
Darwin's Conjecture: Discussing the Ontological Foundations of Evolutionary Economics.
European Association for Evolutionary Political Economy (EAEPE), Vienna.

CALLEBAUT W.
Scientific Perspectivism: A Philosopher of Science's Response to the Challenges of Big Data Science and Multiscale Modeling.
Center for Mind/Brain Sciences, University of Trento, Rovereto.

CALLEBAUT W.
Beyond Flat Earth Systems Biology: Biocomplexity Research as an Exemplar of Multilevel, Multiscale Modeling.
Session 'Evolution of Biological Complexity': 14th Congress of Logic, Methodology and Philosophy of Science, Nancy.

CALLEBAUT W.
Synthesis: Interdisciplinary Interconnections in Synthetic Biology.
Center for Interdisciplinary Research (ZiF), Bielefeld.

CALLEBAUT W.
Synthetic Biology—Making as Knowing?
International Society for the History, Philosophy and Social Studies of Biology, Salt Lake City, UT.

CALLEBAUT W.
Beyond a Theory of Biological Theories
26th Altenberg Workshop in Theoretical Biology: The Meaning of 'Theory' in Biology, KLI, Altenberg.

CALLEBAUT W.
Philosophical Perspectives on Making Sense of Data.
Panel discussion (with Rachel Ankeny, Richard Burian, John Dupré, Staffan Müller-Wille, and Bruno Strasser), Symposium, 'Making Sense of Scientific Data,' Egenis & KLI, Exeter.

CALLEBAUT W.
Big Data Biology, Multi-scale Modeling, and Scientific Perspectivism.
38th Annual Philosophy of Science Conference. Inter-University Center Dubrovnik.

CALLEBAUT W.
How Evolutionary Developmental Biology Changes Our View of Evolution.
Charles University, Prague.

CALLEBAUT W.
How Evolutionary is Evolutionary Economics?
Institut pour l'Histoire et la Philosophie des Sciences et Techniques, Paris.

CALLEBAUT W.
The Future of Scientific Freedom.
KLI.

CALLEBAUT W.
De toekomst van wetenschappelijke vrijheid.
Universiteit Hasselt, Belgium.

CHRISTENSEN WD.
The Representational Demands of Mind Reading.
With John Michael. Varieties of Representation: Kazimierz Naturalist Workshop Centre for Philosophical Research, Kazimierz, Krakow.

CHRISTENSEN WD.
A Systems Approach to the Evolution of Cognition.
International Society for the History, Philosophy and Social Studies of Biology, Salt Lake City, UT.

CHRISTENSEN WD.
Embodied Agency and Higher Cognitive Processes.
Return of the Masses – Towards a Transdisciplinary Analysis of Sur-Individualism, GNOSIS, Aarhus University, Copenhagen.

CLARKE E.
The Multiple Realisability of Biological Individuals.
38th Annual Philosophy of Science Conference. Inter-University Center Dubrovnik.

CLARKE E.
How to Count Organisms.
International Society for the History, Philosophy and Social Studies of Biology, Salt Lake City, UT.

CLARKE E.
Individuality in Plants.
14th Congress of Logic, Methodology and Philosophy of Science, Nancy.

FRASNELLI E.
Understanding Handedness and Lateralization across the Animal Kingdom.
Department of Biology, McGill University, Montreal.

FRASNELLI E.
Understanding Handedness and Lateralization across the Animal Kingdom.
Brooklyn College, New York.

FRASNELLI E.
Lateralization in Insects: Theoretical and Experimental Approaches.
2nd ToK conference of CompCog, Prague.

FRASNELLI E.
A Fellow's Perspective.
20th KLI anniversary, Palais Daun-Kinsky, Vienna.

FRASNELLI E, RIGOSI E, ANFORA G, TRONA F, VALLORTIGARA G.
Lateralization in the Invertebrate Brain: Left-right Asymmetry of Olfaction in Apoidea Species.
43rd European Brain and Behaviour Society (EBBS) Meeting, Seville.

GÓMEZ-ROBLES A.
Morphological Integration in the Hominin Dentition. Evolutionary, Developmental, and Functional Factors.
Seminar at the Department of Theoretical Biology, University of Vienna.

GÓMEZ-ROBLES A.
Morphological Integration in the Hominin Dentition. Evolutionary, Developmental, and Functional Factors.
I Meeting of the European Society for the Study of Human Evolution, Leipzig.

GÓMEZ-ROBLES A.
Ancestral State Reconstruction on the Hominin Phylogeny. Evolutionary Inferences based on Dental Morphology.
Cognitive Science Students Lab Visit, KLI.

HANDSCHUH S.
From Visualization to Quantification: Challenges for Morphology in the Age of 3D-Datasets.
4. Graduiertenforum der Fachgruppe Morphologie der Deutschen Zoologischen Gesellschaft, München.

HANDSCHUH S, MOOSBRUGGER M, ZATLOKAL A, ZOPP L, SCHWAHA T.
Funiculus Development in the Freshwater Bryozoan *Cristatella mucedo*.
2nd International Congress on Invertebrate Morphology, Harvard University, Cambridge, MA.

HANDSCHUH S, NEMESCHKAL H, METSCHER B, MITTERÖCKER P, MÜLLER GB.
Sexual Selection and the Evolution of Sexual Dimorphic Appendages in Amphipods.
13th Congress of the European Society for Evolutionary Biology, Tübingen.

KUBITZA R, KOTRSCHAL K, SCHWAB C.
Social Network Analysis of Pair Bond Relationships in Free-flying Jackdaws, *Corvus monedula*.
5th topical meeting of the Ethologische Gesellschaft: Animal Communication. Berlin.

MACLEOD M.
What Kinds of Kinds are Homologies: Studying Homology Concepts as Significant Kinds.
European Philosophy of Science Association Conference, Athens.

MACLEOD M.
A New Look at Grouping Practices in the Life Sciences: Significant Kinds and the Epistemic Roles of Kind Concepts.
Minnesota Center for Philosophy of Science, University of Minnesota, Minneapolis.

MACLEOD M.
Limitations of Natural Kind Talk for Understanding Scientific Practice in the Life Sciences: Homology and other Cases.
Workshop: University of Granada & KLI. Granada.

MACLEOD M.
Homology Concepts as Kind Concepts: the Epistemic Dimension of Homology Concepts and their Disputes.
International Society for the History, Philosophy and Social Studies of Biology (ISHPSSB) Conference. Salt Lake City, UT.

72 MACLEOD M.
Kinds, Natural Kinds and Grouping Practices in Research Contexts.
Third Biennial Society for Philosophy of Science in Practice Conference, Exeter.

MACLEOD M.
Homologies as Significant Kinds: Identifying the Differences between Biological and Phylogenetic Homology Concepts.
38th Annual Philosophy of Science Conference. Inter-University Center, Dubrovnik.

MÜLLER GB.
Die Erweiterte Synthese der Evolutionstheorie.
Deutsches Museum, Munich.

MÜLLER GB.
Conceptual Issues of an Extended Evolutionary Synthesis.
IHPST, Université Paris 1, Panthéon-Sorbonne.

MÜLLER GB.
Die großen Veränderungen in der Evolutionstheorie.
Pro Scientia Sommerakademie 'Entwicklung', Seggau.

MÜLLER GB.
The Evolution of Evolutionary Theory.
82. Jahrestagung der Paläontologischen Gesellschaft, Vienna.

MÜLLER GB.
Evolving Complex Organisms.
Symposium 'From Chemistry to Evolution,' University of Vienna.

MÜLLER GB.
The Systems Turn in Evolutionary Theory.
Symposium 'Systems in Biology,' University of Vienna.

NICHOLSON DJ.
The Machine Conception of the Organism: A Critique of Its Prevalence in Biology.
38th Annual Philosophy of Science Conference. Inter-University Centre, Dubrovnik.

NICHOLSON DJ.
Biology as Engineering: The Ontological and Epistemological Presuppositions of Synthetic Biology.
Biennial Meeting of the International Society for the History, Philosophy and Social Studies of Biology. Salt Lake City, UT.

NICHOLSON DJ.
What is the Philosophy of Biology?
University of Vienna Cognitive Science Lab Meeting, KLI.

NUÑO DE LA ROSA GARCÍA L.
3D Modeling and Organicism in Development and EvoDevo.
Biennial Meeting of the International Society for the History, Philosophy, and Social Studies of Biology. Salt Lake City, UT.

NUÑO DE LA ROSA GARCÍA L.
3D Modelling, Organicism and Mechanical Explanation in Contemporary Developmental Biology and EvoDevo.
3rd SPSP conference, Egenis, University of Exeter.

NUÑO DE LA ROSA GARCÍA L.
Becoming Organisms: The Organisation of Development and the Development of Organisation.
Centre de Recherche en Epistémologie Appliquée, CNRS/Polytechnique. Paris.

NUÑO DE LA ROSA GARCÍA L.
Becoming Organisms: Recovering the Aristotelian Distinction Between Being in Potency and Being in Actuality.
KLI.

RIGOSI E, FRASNELLI E, ANFORA G, VALLORTIGARA G, HAASE A.
Brain-behavioural Lateralization in Honeybees:
Odour Dependent Asymmetry and a First Morphological Comparison of the Primary Olfactory Centre.
43rd European Brain and Behaviour Society (EBBS) Meeting, Seville.

SCHWAB C.
Social Networks in Jackdaws, Corvus monedula.
Department of Cognitive Biology, University of Vienna.

SCHWAB C.
Sociality in Corvids: Networks, Relations, and Social Learning.
KLF Anniversary Symposium: Frontiers in Behavioural Biology. Vienna.

SCHWAB C.
Soziales Lernen und Netzwerke bei Raben und Dohlen.
Advanced training course for Biology teachers, Austria.

SCHWAB C, BUGNYAR T.
Conspecifics´ Behaviour May Induce Cooperative Choices in Jackdaws.
Workshop 'Naturalistic Approaches to Culture?' Balatonvilágos, Hungary.

SCHWAB C, BUGNYAR T, KOTRSCHAL K.
Exceeding the Pair Bond: Social structure of Jackdaw Networks.
5th European Conference on Behavioural Biology, ECBB. Ferrara.

SCHWAB C, BUGNYAR T, KOTRSCHAL K.
Socio-positive Interactions in Juvenile Jackdaws, *Corvus monedula*: Structure, Reciprocity, and Preference.
5th topical meeting of the Ethologische Gesellschaft: Animal Communication. Berlin.

SCHWAB C, SWOBODA R, KOTRSCHAL K, BUGNYAR T.
Recipients Affect Other-regarding Preferences in Jackdaws.
Behavior 2011. Bloomington, IN.

SCHWAHA T, HANDSCHUH S.
3D Anatomy of the Organ Systems of Solitary Kamptozoa.
2nd International Congress on Invertebrate Morphology. Harvard University, Cambridge, MA.

SHIFFERMAN E.
Cognitive Aspects of Sperm Competition.
Fall meeting of the Comparative Cognition Society. Seattle, WA.

SZIPL G, SCHWAB C, KOTRSCHAL K, WANKER R.
Complexity and Individuality in the Contact Calls of Jackdaws.
5th European Conference on Behavioural Biology, ECBB. Ferrara.

SZIPL G, SCHWAB C, WANKER R, KOTRSCHAL K.
Individual Information in Jackdaw Vocalizations.
5th topical meeting of the Ethologische Gesellschaft: Animal Communication. Berlin.

VERPOOTEN J.
Art and Signaling in a Cultural Species: a Comparative Approach.
Department of Psychological Basic Research. University of Vienna.

VERPOOTEN J.
Art and Adaptationism.
University of Vienna Cognitive Science Lab Meeting, KLI.

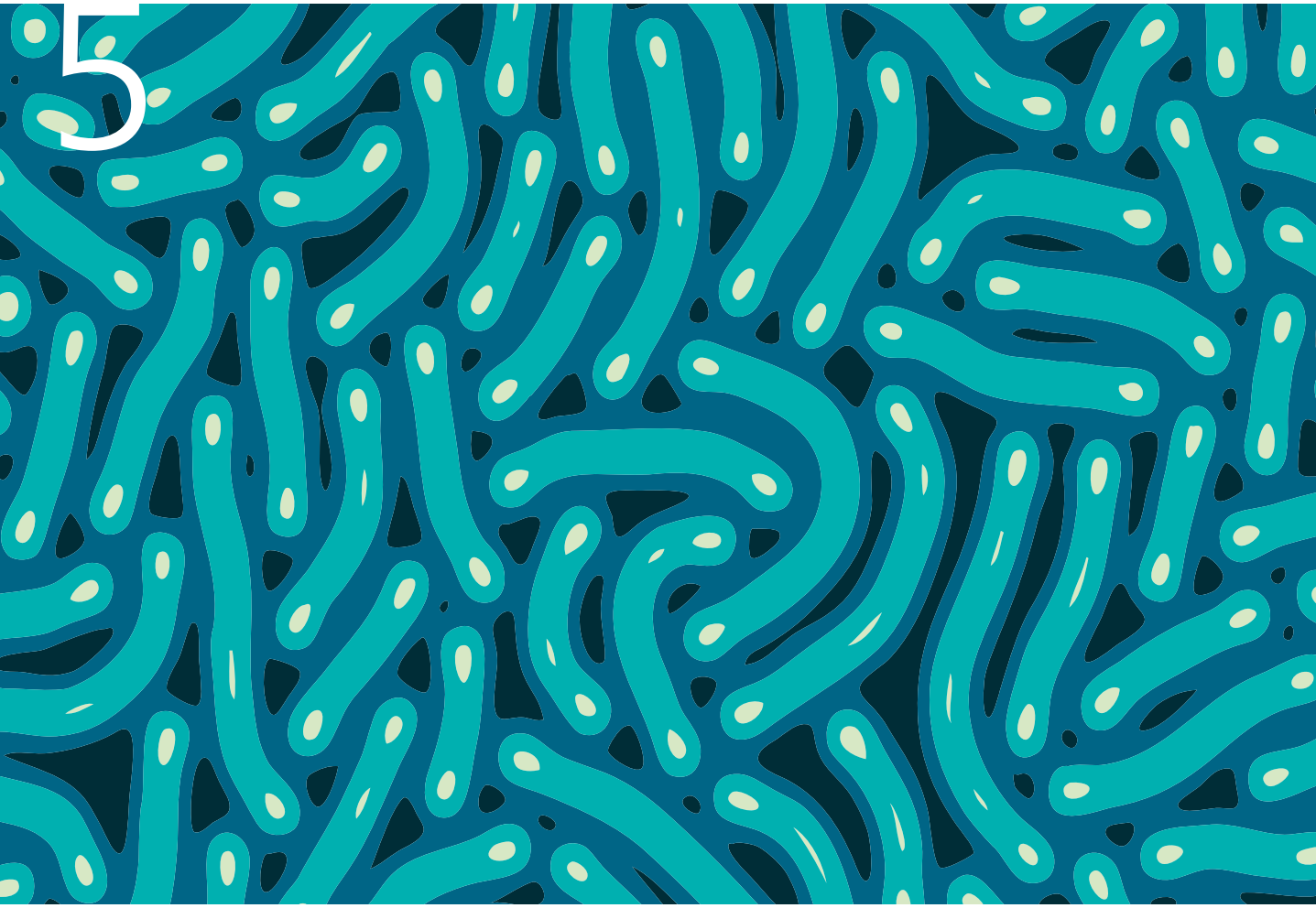
VERPOOTEN J.
Brian Boyd's 'On the Origin of Stories.' A review.
Human Evolution and Behavior Network (HEBeN) workshop, Katholieke Universiteit Leuven.

VERPOOTEN J.
How Human Building Behavior may have Affected the Evolution of Intelligence and Ecological Dominance.
European Science Foundation and Budapest University of Technology and Economics.

VERPOOTEN J.
Art and Signaling in a Cultural Species: a Comparative Approach.
38th Annual Philosophy of Science Conference. Inter-University Centre Dubrovnik.

Further Activities

5



Many activities of the KLI transgress the scientific core area. Some representative activities are listed here.

5.1 Celebration of 20 Years KLI

12 May 2011
Palais Daun-Kinsky, Vienna

The KLI – a modern equivalent to Plato's ideal symposium, an environment in which ideas are exchanged freely among friends who share the excitement that comes when knowledge is valued and preserved for its own sake.

Karl J. Niklas, Cornell University

GERD B. MÜLLER
KLI, Universität Wien
Das KLI als Alternative

ELISA FRASNELLI
KLI
A Fellow's Perspective

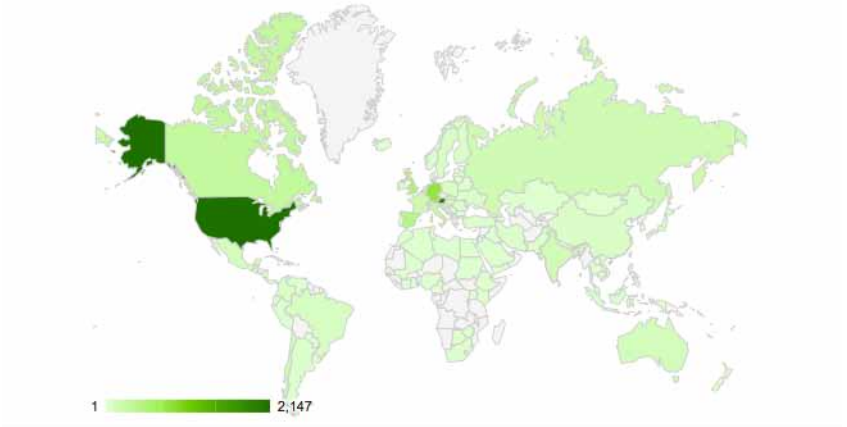
GERHARD ROTH
Universität Bremen
Wie einzigartig ist der Mensch?

5.2 New Homepage

www.kli.ac.at

To keep abreast with an up-to-date internet presence, the KLI commissioned the design of the new KLI homepage which was launched on 16th Dezember 2011. The new Internet appearance features a graphically sophisticated design and a technical versatility, but at the same time offering excellent useability. Up to April 2012, almost 7.000 people visited the new homepage and looked at more than 41.000 KLI pages. Compared to the old homepage, there was a tenfold increase of visitors per months on average.

Interestingly, most KLI-internet visitors come from the US, Austria, Germany, Spain, and the UK followed by Canada, Italy, France and Russia.



The most frequently visited pages were the ones describing the fellows´ projects, the introductory presentation of the institute, the publications of the KLI, and the event calendar.

5.3 New Members

The following new members were elected at the General Assembly 2011:

Dagmar Lorenz-Quattrini, Florence
Sabina Leonelli, Exeter

5.4 Acknowledgment

The KLI is grateful to the Department of the Federal State Government of Lower Austria, Division for Science and Research for additional financial support contributing to the conservation of the Lorenz mansion.