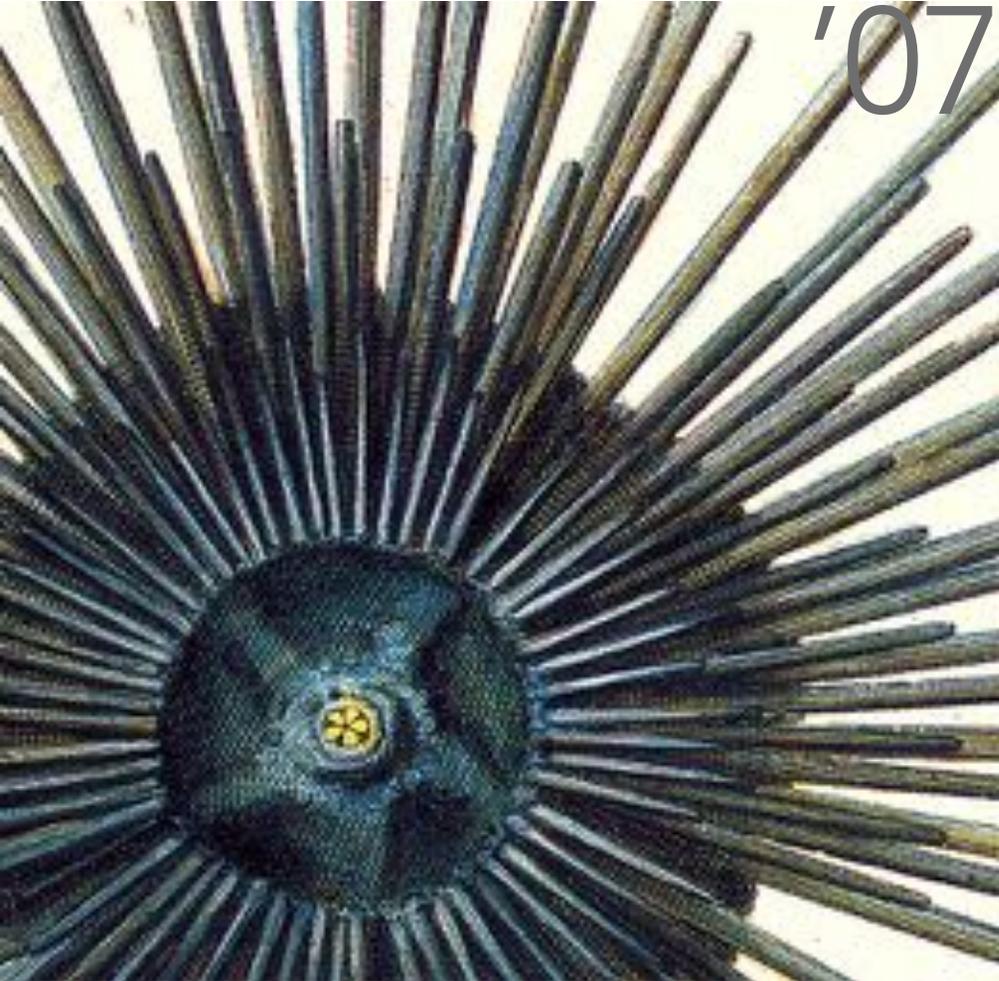


Tätigkeitsbericht Report

'07



KLI

of the  
activities

Konrad Lorenz Institute  
for Evolution & Cognition Research



## Inhalt Contents

Seite Page

1	<b>1 Jahresrückblick und Struktur des KLI</b> Review 2007 and Structure of the KLI
	1.1 Jahresrückblick 2007 / The Year in Review
	1.2 Das KLI / The KLI
	1.3 Institutsorganisation / Organization of the KLI
6	<b>2 Wissenschaftliche Projekte</b> Scientific Projects
	2.1 Bewerbungen / Applications
	2.2 Dissertationsstipendien / Thesis Fellowships
	2.3 Postdoktoranden-Stipendien / Postdoctoral Fellowships
	2.4 Prizibram-Stipendium / Prizibram Fellowship
	2.5 Gastwissenschaftler / Visiting Scientists
22	<b>3 Wissenschaftliche Veranstaltungen</b> Meetings and Lectures
	3.1 Altenberg Workshops in Theoretical Biology
	3.2 Symposien / Symposia organized or co-organized by the KLI
	3.3 Altenberger Seminare / Altenberg Seminars
	3.4 Beiträge zur Darwin Lecture Series
	3.5 Mittagsdiskussionen / Brown Bag Discussions
40	<b>4 Publikationen</b> Publications
	4.1 Bücher / Books and Edited Volumes
	4.2 Vienna Series in Theoretical Biology
	4.3 Fachartikel / Professional Papers
	4.4 Artikel im Druck / Papers in Press
	4.5 Zeitschrift „Biological Theory“ / Journal
	4.6 Doktorarbeiten / Supported Theses
	4.7 Publierte Abstracts / Published Abstracts
	4.8 Vorträge und Kongressbeiträge / Scientific Presentations
58	<b>5 Weitere Aktivitäten</b> Further Activities
	5.1 Konrad Lorenz Archive
	5.2 Visions of the KLI
	5.3 Zusätzliche Förderungen / Additional Funding

Jahresrückblick und Struktur des KLI  
Review 2007 and Structure of the KLI

1



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

*Mina Bissell,*

*Lawrence Berkeley National Laboratory*

## 1.1 Jahresrückblick 2007 The Year in Review

Als einzigartigen, reflexiven und magischen Ort haben Fellows und Gäste das KLI beschrieben. Aber was macht diese Qualitäten aus? Das geschichtsträchtige Haus im leicht verwilderten Anwesen? Die ungewöhnliche Mischung von Wissenschaftlern aus unterschiedlichsten Disziplinen? Die ausgesuchten Themen vom Rande des fachzentrierten Mainstreams? Vielleicht all dies, mag sein. Aber der eigentliche Effekt stammt sicher daher, dass aufgrund der Unabhängigkeit welche die Stiftung ermöglicht, das KLI nicht wie andere akademische Einrichtungen unter jene Ökonomisierungszwänge geraten ist, nach denen immer genauer festgelegt werden muß, welche Leistungen in welchem Zeitrahmen produziert werden sollen. Dieses postmoderne Postulat der Effizienzmaximierung ist dem wissenschaftlichen Bedürfnis gegenläufig. Am KLI darf nachgedacht werden. Darin besteht der entscheidende Gegensatz zum Alltagsgeschäft der großen Institutionen, diese Situation wird heute oft als magisch empfunden. Und wenn die Tätigkeitsberichte anlässlich der Generalversammlungen auch ein stetes Wachstum der Ergebnisse ausweisen, so ist dies viel mehr ein Effekt der Anziehungskraft auf kreative Geister als ein Zwang zur Leistung. Wir sollten diese Hauptfunktion des KLI als intellektuellen Entfaltungsort im Mahlstrom der Getriebigkeit nicht vergessen, selbst dann, wenn wir die Verbesserung der sichtbaren Leistungen mit Enthusiasmus im Auge haben.

Das Team der Mitarbeiter ist ein weiterer Faktor für den Erfolg des KLI. Eva Karner führt das Sekretariat mit großem Einsatz und Verstand und ist allen Besuchern schon ans Herz gewachsen bevor sie überhaupt angekommen sind. Werner Callebaut hat, zusätzlich zu seinen vielfältigen Aufgaben als Scientific Manager, als Editor-in-Chief von „Biological Theory“ mit übernatürlichen Kräften eine weitere Jahresnummer herausgebracht. Seit einigen Monaten steht ihm eine englischsprachige Lektorin, June Hall, zur Seite. Astrid Jütte erledigt neben der technischen Geschäftsführung eine Unzahl wenig bedankter Aufgaben die für das Funktionieren des Instituts unabdinglich sind. So wurde die vorliegende neue Gestaltung der Jahresberichte von ihr gemeinsam mit dem Graphiker Wolfgang Bledl realisiert, um die Mission und die Leistungen des KLI noch besser zur Geltung bringen. Im Verein mit dem Bildband „Visions of the KLI“ und dem „KLI Folder“ ist damit die graphische Präsentation des KLI auf eine einheitliche Linie gebracht worden.

Im Jahr 2007 haben insgesamt 15 Wissenschaftler und Wissenschaftlerinnen aus den Bereichen Anthropologie, Artificial Intelligence, Ethologie, Erkenntnistheorie, Ökologie, Ökonomie, Philosophie, Spieltheorie und anderen Fachgebieten ihre Projekte am KLI verfolgt. Zwei unserer Stipendiaten beendeten erfolgreich ihre Doktorarbeit, vier Bücher und Sondernummern wurden mit Unterstützung des KLI herausgegeben, in der „Vienna Series in Theoretical Biology“ sind zwei neue Bände erschienen, und der Band „Modularity“ erfuhr eine zweite Auflage. Unsere Fellows und Mitarbeiter publizierten 35 wissenschaftliche Artikel in internationalen Fachzeitschriften oder Buchbänden und hielten insgesamt 74 Vorträge im In- und Ausland. Diese Ergebnisse, wie auch die Aktivitäten in allen übrigen Sektoren finden sich im vorliegenden Bericht im Detail dargestellt.

Wie immer danke ich an dieser Stelle allen Förderern, Funktionären, Fellows, Mitgliedern und Mitarbeitern für ihren Einsatz und für ihre fortgesetzte Unterstützung des KLI. Ohne Euch wäre die Magie des KLI nicht möglich!

*Univ. Prof. DDR. Gerd Müller*  
*Vorstandsvorsitzender*

## 1.2 Das KLI The KLI



- 4 Das KLI ist ein internationales Zentrum für theoretische Biologie. Das Institut fördert die Formulierung, Analyse und Integration biologischer Theorien sowie die Untersuchung ihrer wissenschaftlichen und kulturellen Konsequenzen. Der thematische Schwerpunkt liegt auf den Gebieten der Evolutionstheorie, der Entwicklungstheorie und der Kognitionstheorie. In diesen Bereichen unterstützt das KLI interdisziplinäre Forschungsprojekte, die entweder Modelle lebender Systeme herstellen oder metatheoretische Darstellungen geschichtlicher, philosophischer oder kultureller Aspekte von biologischen Theorien zum Ziel haben. Die wissenschaftlichen Arbeiten werden durch die Vergabe von Stipendien gefördert, die aufgrund eingereicherter Projektanträge und internationaler Begutachtung in sieben verschiedenen Kategorien vergeben werden.

Neben den wissenschaftlichen Projekten verfolgt das KLI seine Ziele durch die Organisation von internationalen Workshops, Symposien und Vortragsreihen, sowie durch die Herausgabe einer wissenschaftlichen Zeitschrift und einer Buchreihe, beide in Zusammenarbeit mit MIT-Press. Das KLI unterhält weiters eine frei zugängliche Internet-Datenbank, die bio- und bibliographische Informationen zu den für das KLI wichtigen Fachgebieten und angrenzenden Disziplinen zusammenfasst, eine kleine Tierhaltung, in der die Durchführung empirischer Projekte möglich ist, und das Konrad Lorenz Archiv, das Briefkorrespondenz, Photo-graphien, Manuskripte, Tagebücher und Auszeichnungen von Konrad Lorenz umfasst. Mit dem KLI Gästehaus steht den Visiting Fellows und Gästen auch eine attraktive Wohnmöglichkeit in Institutsnähe zur Verfügung.

## 1.3 Institutsorganisation Organization of the KLI

### Vorstand / Board of Directors

PROF. DDR. GERD MÜLLER (Vorsitzender)  
Department für Theoretische Biologie, Universität Wien

PROF. DR. REINHARD BÜRGER  
Institut für Mathematik, Universität Wien

PROF. DR. FRANZ M. WUKETITS  
Institut für Wissenschaftstheorie und Wissenschaftsforschung, Universität Wien

DR. CHRISTIAN GASSAUER-FLEISSNER  
Gassauer-Fleissner Rechtsanwälte GmbH

DR. PRIMUS ÖSTERREICHER  
PKF Österreicher-Staribacher Wirtschaftsprüfungsgesellschaft

### Geschäftsführung / Management

PROF. DR. WERNER CALLEBAUT (Wissenschaftlicher Manager)

DR. ASTRID JÜTTE (Geschäftsführung)

**Editor-in-Chief Biological Theory**

5

PROF. DR. WERNER CALLEBAUT

**Sekretariat / Secretary**

EVA KARNER

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Humanethologisches Filmmarchiv der Max-Planck-Gesellschaft

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PROF. DR. PETER SCHUSTER  
Institut für Theoretische Chemie und Molekulare Strukturbioogie, Universität Wien

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

PROF. DR. MICHAEL TOMASELLO  
Max-Planck-Institut für Evolutionäre Anthropologie, Leipzig

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

**External Faculty**

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

PROF. DR. MANFRED LAUBICHLER  
Department of Biology, Arizona State University, Tempe, AZ, USA;  
Max-Planck-Institut für Wissenschaftsgeschichte, Berlin

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

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

## Wissenschaftliche Projekte Scientific Projects

# 2



*Für Projekte im Bereich der theoretischen Biologie vergibt das KLI sieben verschiedene Arten von Stipendien für Studenten, Postdoktoranden und Gastwissenschaftler für eine Dauer von jeweils einigen Wochen bis zu 3 Jahren. Alle eingereichten Projekte werden einem internationalen Review unterzogen.*

## 2.1 Bewerbungen Applications

Insgesamt erhielt das KLI im Jahr 2007 über 40 Anfragen für Stipendien und Fellowships, wovon 11 vom Vorstand behandelt, und 10 für das laufende oder kommende Jahr genehmigt wurden.

	Anträge	genehmigt
Thesis-Stipendien und Junior-Stipendien	1	1
Postdoktoranden- / Przibram-Stipendien	7	6
Gastwissenschaftler-Stipendien	3	3

## 2.2 Dissertations-Stipendien Thesis Fellowships

**Dr. Christophe HEINTZ**

(July 2007 - June 2009)



*Christophe Heintz studied mathematics at the University of Paris 7 (Jussieu), specializing, at the master level, in mathematical logic. He also studied philosophy at the Universities of Paris 4 (Sorbonne) and Cambridge, specializing, at the master level, in the philosophy of science. Mr Heintz completed his PhD work at the Institut Jean Nicod – EHESS. His main research interest concerns the relations between cognitive and social factors in scientific knowledge production, especially mathematics and social anthropology. He has lately renewed his interest in mathematics with evolutionary game theory and complex system theory as tools for modelization.*

### **The Co-evolution of Scientific Cognition and Institutions**

#### **Die Co-Evolution von wissenschaftlicher Erkenntnis und Institutionen**

The project consists of an analysis of the historical evolution of scientific knowledge that integrates social studies of science and studies on the biological basis of cognition from evolutionary psychology. My research investigates how cognitive abilities with a plausible evolutionary history can beget scientific knowledge. The conclusion I have drawn is that scientific thinking heavily relies on the cultural environment, which provides the interpretative framework for scientific reasoning. Social intelligence and metarepresentative abilities put innate inference processes (designed by evolution) at work on cultural scientific environments. The latter are thus being exploited and enriched by minds that need not be either domain general calculating devices or extremely plastic and evolving structures. On the other hand, the evolution of science is said to rely on the interaction between the social and the cognitive factors in scientific knowledge production. In order to understand the processes of co-evolution of culture and cognition in the history of science, I have especially drawn on the theoretical resources of cognitive anthropology

8



(Sperber's epidemiology of representation, Hutchins' distributed cognition) and situated cognition.

The project consists of showing the relevance of another theoretical resource, New Institutional Economics, in order to account for an understudied form of co-evolution of cognition and culture: the co-evolution of scientific institutions and scientific cognition. The evolution of scientific institutions is of special interest because institutions provide the rules of proper scientific practices that constrain and empower scientific thinking. Also, economic models of the emergence of institutions promise to be relevant to evolutionary epistemology because they provide a framework allowing for the study of the flow of information in social structure with models of agents that are psychologically adequate. Also, evolutionary game theory provides the formal basis of Institutional Economics, thus placing my own research in an evolutionary perspective.

My case study shall be the institutions that organize the access to scientific information, such as journals, ISI's evaluative processes and, recently, the Internet. These institutions, indeed, determine scientists' trusting behaviour and need be incorporated in an account of scientific cognitive processes for the attribution of cognitive resources to scientific sources of information.



**Dr. Philipp MITTERÖCKER**  
(August 2007 - July 2008)

*Philipp Mitteröcker obtained his PhD from the Institute for Anthropology, University of Vienna. He is working on new geometric morphometric methods and applies them to the study of the evolution and development of primate anatomy. He published on morphological integration, ontogeny and phylogeny of hominoid craniofacial morphology, and morphometric methods for curves and surfaces.*

### **Modularity and Morphological Integration in the Hominoid Cranium**

#### **Modularität und morphologische Integration des menschlichen Schädels**

There is a wide agreement that modularity is a prerequisite for the hierarchical phenotypic organization of higher organisms as well as for the appearance of complex adaptations. While studies of modularity are often experimental, morphological integration is a more descriptive concept whereby groups of correlated phenotypic characters are often interpreted as modules. I will show that the classic assumption of morphological integration (high correlations within modules, lower correlations between modules) is met only for the unrealistic case of nearly isometric growth factors and discuss the consequences for the morphometric assessment of modularity.

My focus will be on the empirical analysis of modularity and integration in the hominoid cranium. I compare postnatal ontogenetic trajectories of humans, chimpanzees, and gorillas by a geometric morphometric approach and draw conclusions about regional dissociation during development and evolution. Additionally, I describe conserved modes of shape variation that integrate facial and neurocranial morphology among the investigated taxa. I will discuss possible phylogenetic conclusions and how such morphometric findings may be interpreted in the light of contemporary evo-devo theory.

**Paola HERNÁNDEZ CHÁVEZ**

(April - September 2007)

*Paola Hernández Chávez obtained her BA of Philosophy and Master in Humanities from the Universidad Autónoma Metropolitana—Iztapalapa, Mexico (thesis: „Scope and Limits of Evolutionary Epistemology: A Revision“) and is currently completing her PhD work in neuro-epistemology.*



### **Reductionism and Normativity in Neuroscientific Programs**

#### **Die Rolle von Reduktionismus und Normen in Neuro-Science-Programmen**

At the end of the previous century a remarkable reformulation of epistemology emerged, i.e., naturalized epistemology. What is characteristic of this epistemology is its rejection to infallibilism and apriorism. It asserts that scientific empirical results are crucial to solve traditional inquiries about knowledge. Quinean naturalized epistemology claimed that we should abandon traditional epistemology and replace it with psychology. Another brand of naturalized epistemology is evolutionary epistemology, an approach to knowledge aiming to answer traditional epistemological questions based on the theory of evolution by natural selection. It has two different but interrelated programs, the first of them (EET). accounts for scientific theory change as resembling the mechanisms of natural selection theory.

The second program (EEM) studies the development of our cognitive capacities and structures as well as their fixation in our brain along evolution. It is the extension of biological theory of evolution to cognitive activity and its apparatus like the brain and sensory and motor systems. After evolutionary epistemology, neurophilosophy, another brand of naturalized epistemology arose, one which is continuing much of the theoretical work started by evolutionary epistemology. It tries to answer traditional epistemic enquiries analyzing the place where knowledge is produced: the brain. A particular representative of this project is P. S. Churchland „neurophilosophy“, a program that looks forward to reduce and eliminate traditional epistemology. Churchland is convinced that neurology is all we need to elucidate questions about knowledge.

10



These three programs have accomplished some kind of reductionism, mainly an eliminative one, and this fact has brought them major impasses.

The twofold purpose of the project is to show that there is no way back once naturalized epistemology has arrived, as long as knowledge is a subject to be disentangled interdisciplinarily. However, it is also pertinent not being captive into exaggerated versions of it, the ones that don't take into consideration human reasoning. The tool for doing so will be the study of reductionism that the mentioned naturalized epistemologies accomplish. In the end I will hazard a theory of reductionism useful for naturalized epistemologies in general.



**Joeri WITTEVEEN**

(December 2007 - May 2008)

*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 at 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 plans to commence with a PhD in philosophy in fall 2008.*

### **The Concept of „Replicator“ in Biological, Cultural and Conceptual Evolution**

#### **Das „Replikator“-Konzept in der biologischen, kulturellen und begrifflichen Evolution**

Richard Dawkins introduced the replicator in *The Selfish Gene* as his contribution to the units of selection debate. The replicator has since gained widespread adoption in biological evolutionary theory, but also in theories of conceptual and cultural evolution. Soon after the publication of *The Selfish Gene*, discussion arose about what other entities than genes and memes could count as replicators (e.g. Bateson, 1978), and discussion has recently revived, especially in relation to conceptual and cultural evolution. Cause of the confusion over the role and presence of replicators in these domains of evolution is the ambiguity in the definition of the replicator. Dawkins' loose definition has recently been made more articulate by biologists and philosophers, but consensus remains absent.

In the light of the adoption of evolutionary theory in the social sciences it has become increasingly important to have a clear definition of replicator. An analysis is needed of the different definitions that have been suggested. These need to be assessed on their applicability in the various domains where evolutionary theory is used, to advance to a well-defined replicator concept. Furthermore, there is lack of agreement about whether replication is necessary for evo-

lution. The answer to this problem hinges on the question what is regarded as a replicator. A well-defined replicator concept can potentially take away confusion about whether replication is necessary. The need for such a solution is especially pressing in recently emerged discussion between theorists of cultural evolution: in dual inheritance theory replicators are regarded as the limiting case of cultural evolution, whereas meme-theory regards the replicator as essential for cultural evolution to take place. I suggest to research the uses and definitions of the replicator concept, to advance to a definition of the replicator that illuminates its use in the different domains in which evolutionary theory is used.

### 2.3 Postdoktoranden-Stipendien Postdoctoral Fellowships

**Dr. Julien DELORD**

(October 2005 - September 2007)

*Julien Delord graduated from the leading engineering university for life sciences in Paris (INA PG) with a MSc in Ecology in 1998. He then studied History and Philosophy of Science at the University of Paris-Sorbonne and completed a PhD on the History and Philosophy of Ecology entitled *The Extinction of Species: Historical and Ethical Issues of an Ecological Concept*. Since 2003 he has lectured in the history of science at different French universities and has participated in the organization of an international conference on Biodiversity by UNESCO in 2005. His main research interest lies in the history and epistemology of ecology and in environmental ethics. In 2004 he was awarded the second prize for young researchers of the French Biodiversity Institute.*



#### **The Neutral Theory of Ecology: An Epistemological Inquiry**

#### **Die neutrale Theorie der Ökologie – Eine erkenntnistheoretische Untersuchung**

After more than 20 years of research on the subject, the ecologist Stephen Hubbell in 2001 proposed a neutral theory of ecology aimed at explaining the distribution and abundance of species in ecosystems. His theory is based on a few simple assumptions: the dynamics of ecological communities are stochastic and are a „zero-sum game“; the equivalence of all individuals of all species in their probability of giving birth, of dying, of dispersing, etc. The vocabulary used by Hubbell („ecological drift,“ „stochastic process,“ „neutrality“) indicates a clear proximity to other neutral theories in the life sciences, such as Kimura’s. Although Hubbell’s theory is still the subject of scientific controversy, we think that this paradigm shift in ecology is sufficiently serious to be analyzed from an epistemological perspective. Thus, we will try to understand the impact of this theory on

12



many traditional ecological concepts (niche, competition, equilibrium, etc.) and evaluate its claims in terms of explanation, prediction, and transformation of ecological dynamics.

On a more general level, Hubbell's ambition is to unify ecological and evolutionary theories in order to create a new paradigm of macroscopic life phenomena. This perspective must also be submitted to a critical inquiry in order to underline the arguments for this unification and its difficulties. Eventually, we should assess the influence of neutral physical models (principle of inertia, stochasticity) on biological models.



**Dr. Simon HUTTEGGER**

(April 2006 - May 2008)

*Simon Huttegger studied philosophy, history, and mathematics at the University of Salzburg (MA, 2002, with a thesis on subjective probabilities). He spent the academic year 2004/05 at the University of California at Irvine. His research concentrates on evolutionary game theory and its applications in philosophy, particularly in the philosophy of science, the philosophy of biology, epistemology, and social philosophy. In his dissertation, *Language and Coordination: Evolution, Social Learning, and the Explanation of Meaning*, he studied adaptive dynamics applied to interactions.*

### **Communication Networks in Adaptive Systems**

#### **Kommunikations-Netzwerke in adaptiven Systemen**

Signaling games provide a basic model for investigating epistemological questions surrounding information transfer, reference and meaning. As such, they have played a prominent role in theoretical biology, economics, AI, and philosophy. So far, mostly two-agent interactions have been studied by embedding them into some evolutionary dynamics. This project aims at investigating how agents network to distribute valuable information (thus shifting attention to interactions between more than two agents). There are two baseline models that will be studied. In the first one, each agent has a piece of information that is valuable to all other agents. They start to connect to each other. Connections are costly. The agents' decisions are governed by some (adaptive) learning mechanism. Each agent gets the information from the agents directly connected to her and from agents indirectly connected to her via her direct connections. The ring turns out to be the unique efficient network structure in this case.

It will be studied what a minimal learning algorithm must look like so that the agents may converge to the ring. Preliminary simulations suggest that some kind of forward-looking property and the ability to take account of the perspectives of other agents might

be a necessary condition of convergence. A second baseline model extends this to a setting where agents simultaneously connect to each other and learn to signal.

The first main objective of this project is to understand more about the constraints on agents who are able to distribute information efficiently.

The second one is related to problems in evolutionary epistemology. If epistemology is the study of the role of information about the world in knowledge systems, then we aim at understanding more about the epistemology of how pieces of information might be put together, when information keeps on flowing, when it is stored, and so on. Finally, the ring structure is also of anthropological interest. Exchange networks like the Kula ring of the Trobriand islands have the structure of a ring. This raises fundamental questions about the strategic aspects and the dynamics of the formation of those kind of networks.

**Dr. Elias L. KHALIL**

(November - December 2007)

*Elias L. Khalil is Professor of Economics at Monash University, Clayton, Australia. He has held visiting positions at the Max Planck Institute for Research into Economics Systems, Judge Institute at Cambridge University, and the Department of Economics at the University of Chicago. He has also held teaching positions at Vassar College, New York, and Ohio State University. He is a co-editor of the Journal of Institutional Economics.*



### **Why Natural Selection Cannot Explain Rationality**

#### **Warum natürliche Selektion Rationalität nicht erklären kann**

Biologists recognize that organisms adjust choice when constraints change, so-called „phenotypic plasticity.“ Economists call it „rationality.“ But what is the origin of rationality? Neo-Darwinists conceive rationality as a trait. But this cannot be the case. Let us suppose two lineages of rationality, R1 and R2. Natural selection would supposedly favor R1 over R2 under C1 constraints and vice versa under C2 constraints. However, if agents are using different rationalities, the fitness functions are incommensurable. For them to be commensurable, there must be only a single kind of rationality, R. But how could R=R1 and R=R2, when R1 and R2 are different?

14



Dr. Ulrich KROHS

(August 2004 – December 2006)

*Ulrich Krohs is a Privatdozent of philosophy at the University of Hamburg. He studied biochemistry and philosophy at Tübingen, Brighton, Aachen, and Hamburg, and holds a PhD from the Technical University of Aachen (1994), resulting from his research on phototaxis of Halobacterium at the Jülich Research Centre. He obtained his Habilitation in Philosophy at Hamburg University in 2004. His current research topics are the notions of biological function and design, and the structures of biological theories and of descriptions of technical artefacts.*

### **The Developmental Aspect of Biological Design**

#### **Entwicklungsbiologische Aspekte von biologischem Design**

The notion of natural design is supposed to do some important work in philosophy of biology: to explain why functional language is adequate in biology, though superfluous in physics. Most attempts to explicate the notion of design as a basis for a definition of biological function result in an explanatory circle.

In contrast, my own explication allows, for the first time, for a non-circular definition of function by reference to design. Like with earlier attempts, the straightforward application of these concepts is the reconstruction of biological theories that are based on genetic determinism. However, the application of the concepts is not restricted to gene-centered theories. They can be used to investigate the various roles that function ascriptions play in different biological theories.

In this project, I will apply the explication of biological design to developmental aspects of biological function, as put forward in the approaches of developmental systems theory (DST) and evolutionary developmental biology (EvoDevo). My aim is a comparison of the role that function ascriptions play within the different theoretical frameworks, as well as a survey of possible justifications for the use of specialized concepts of function in these approaches.

To follow this goal, I will first reconstruct biological theory elements (models) that belong to the approaches mentioned. Reconstructions will be based on Lakatos's methodology of scientific research programs and on an informal variation of the structuralist approach of model theory.

Dr. Konrad TALMONT-KAMINSKI

(June - November 2007)



*Konrad Talmont-Kaminski is a lecturer at the Marie Curie Skłodowska University in Lublin, Poland. He obtained his BA in History and Philosophy of Science from the University of Melbourne, his MA from the University of Western Ontario, and his doctorate from Monash University. His work lies within analytical epistemology and philosophy of science and focuses on developing a broadly Peircean naturalized account of reason. For many years he has been working with John Collier, a past KLI Fellow.*

### **Superstition as a Natural Cognitive Phenomenon**

#### **Aberglaube als natürliches kognitives Phänomen**

Superstition is generally understood as the paradigmatic example of irrationality. While this view is correct in so far as it goes, it fails to explain two very significant questions. Firstly, why it is that superstitious thinking should arise in evolved beings when it would seem that it is an impediment rather than an aid in survival. Secondly, why superstition, itself, should have not just survived but done very well despite ongoing efforts to weed it out.

Both questions become much easier to answer when we see superstition not as the opposite of rationality but, rather, as the lamentable by-product of the limited cognitive capabilities and mechanisms available to us. Indeed, once we understand that rationality is bounded, systematic shortcomings such as superstition become predictable. And, while it is impossible to know at this point the actual evolutionary history of superstition, it should be possible to see how it could be that superstition could arise in organisms undergoing evolutionary change.

This naturalist theoretical framework allows us to look at a number of interesting issues regarding superstition. The first is the possibility of characterising superstition, as opposed to false or irrational beliefs in general. The second is to try and understand the relationship between superstitious beliefs and superstitious practices. The third is to see to what degree and for what reasons superstition is a problem. The fourth is the nature of the relationship between superstition and another element of human beliefs that would seem surprising from a purely rational point of view – religious beliefs. The fifth is to examine which of our cognitive mechanisms fail us and cause superstition to be so attractive to us. The sixth is whether superstition is a necessary element of human nature or if its influence may be eliminated.

The overall aim of the project, therefore, is to fit superstition into a thoroughly naturalised world view, and, in particular, a naturalised view of rationality as bounded and evolved. The hope is that the result will be to cast light upon superstition and, in reflection, upon rationality.

16



Dr. Davide VECCHI  
(October 2006 - September 2008)

*Davide Vecchi obtained his first degree in philosophy from the University of Bologna, Italy. After unconvincingly attempting to pursue a career in business, he has been fully lured back to the temptations of philosophy. He was recently awarded a PhD from the London School of Economics and Political Science, where he worked under Elliott Sober's co-supervision. His main research aim is to apply the idea of the universality of selection to science by developing a variation-selection model of evolutionary epistemology that manages to make sense of the apparent progress of scientific knowledge.*

### **The Epistemological Implications of Selection Theory**

#### **Erkenntnistheoretische Implikationen der Selektionstheorie**

In recent years the research program labelled Selection Theory has seen a number of extensions that would certainly have pleased Donald T. Campbell. My opinion is that this expansion of the framework is a necessary evolutionary step in the long-term process of evaluation of the progressiveness of the program. However, even though such an expansion is necessary, it has not been generally accompanied by a more philosophical assessment and reconsideration of the fundamentals of the program. I wish to avert this trend.

Campbell (1974) spoke of the thesis of the universality of selection as the „dogma“ of his approach. I wish to reconsider, by exploring Campbell's work and the recent work on selection theory, whether the universality thesis can be genuinely treated as an empirical hypothesis, and, above all, if it is a sound one. After Campbell proposed it, the thesis in all its different formulations was either snubbed or happily endorsed, but never seriously criticized. More recently a number of well-articulated criticisms have been raised against the universalism of the thesis, generally pointing to its more circumscribed range of application.

I first wish to analyze the nature and status of Campbell's blind-variation-and-selective-retention model. In particular, I wish to focus on the metaphysical issues concerning the nature of selection processes (i.e. their logic and range of application, and the nature of the various formulations of the universality thesis) and on their characterization (i.e., the nature of the slippery notion of „blindness“ of variation involved, their populational requirements, their limits).

Being primarily an evolutionary epistemologist, I will then move to reconsider the epistemological implications of the universality thesis. The trend in recent years has been to give up the search for a logic of science in favor of a sociology of scientific validity. For instance, Hull and Campbell (1997) put stronger emphasis on the sociological analysis of the scientific process, seemingly in line with the naturalism of their epistemological approaches. Even though I consider the

sociological approach as an indispensable part of a complete evolutionary epistemology, I believe that something has been left out by endorsing a hard-core sociological perspective. This is why I plan to investigate whether there are any good reasons to revive our interest in the „logic“ of selection. My suspicion is that selection theory can provide a „logic“ of discovery and justification (or, more properly, a sound account of the scientific processes of hypotheses generation and selection) somehow along the lines — aptly revised, of course — of what Popper sought (the logic of trial and error).

In a sense, I would like to revive the deep implications of Campbell's and Popper's work by proposing that selection theory per se has normative value.

Finally, I wish to consider what implications would a revived interest in the logic rather than sociology of scientific validity have on evolutionary epistemology as a naturalized epistemology.

**Dr. Zsófia VIRÁNYI**

(June 2006 - July 2008)

*Zsófia Virányi studied biology at Eötvös Loránd University, Budapest and graduated with a thesis on knowledge attribution in dogs and children. During her PhD studies in ethology she examined the domestic dog's reasoning abilities and in some aspects compared them to children, apes, monkeys, and wolves. She participated in the project of the Department of Ethology, Eötvös Loránd University comparing hand-raised wolves and dogs in their relationship and communication with humans. At the Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany she made a comparative study on knowledge attribution in great apes and dogs under the supervision of Josep Call. Later at Kazuo Fujita's lab, Primate Research Institute, Kyoto University she tested pigeons and capuchin and squirrel monkeys in a task on inferential reasoning about the location of food.*



### **Rationality and Attentional Coordination in Social Learning in Marmosets and Dogs**

**Rationales und aufmerksamkeitsgesteuertes soziales Lernen bei Kallaffen und Hunden**

Imitation has been demonstrated in apes, monkeys, and birds. In accordance with some recent theories (e.g. Associative Learning (ASL) Theory), imitative capacity may depend on cognitive mechanisms (learned perceptual-motor links), which are likely to be available in various non-human species. Human imitation, however, shows some intriguing characteristics: It is not about automatically copying some others' behavior, but shows context-dependency in at least two ways:

18



1) It seems to involve some selective, inferential processes, taking not only the performed behavior but also its outcomes and constraints into account.

2) It seems to be interlinked with and affected by coordinated gazing behavior and other social cues of the demonstrator and the learner.

While non-human research has tried to determine whether and which species of animals are able to imitate others' behavior, human research focuses on the question which specialities of human imitation and which other characteristics of human social information transmission might have contributed to the evolution of human culture. Candidates are the capability for reasoning, which goes beyond associative psychological processes and the attentional coordination of companions, which makes social information transmission more effective.

Both marmosets and dogs have been found to engage in different forms of social learning but the above aspects have hardly been examined, although they may provide valuable non-human models with the special interest of the distinctive evolutionary histories of these two species.

## 2.4 Przibram-Stipendium Przibram Fellowship



Dr. Joanna BRYSON  
(August 2007 - July 2009)

*Joanna Bryson holds degrees in behavioral science, psychology and artificial intelligence from Chicago (BA), Edinburgh (MSc and MPhil), and MIT (PhD). Since 2002 she has been assistant professor at the University of Bath, where she founded Artificial Models of Natural Intelligence. She has forty-nine reviewed research publications, including articles in *Animal Cognition* and in *Philosophical Transactions of the Royal Society - B, Biology*. She serves as an expert consultant for the European Commission on cognitive systems.*

### Factors Limiting the Evolution of Cultural Evolution

#### Die Evolution der kulturellen Evolution limitierende Faktoren

This project examines the hypothesis that cultural learning is rare not because the mechanisms of learning required for an individual learner are difficult to evolve in themselves, but because of the impact on the ecological and social system supporting learners. While cultural evolution has the potential to be a powerful means to search for new and more optimal behaviour, where cultural evolution exists, it must co-evolve with a set of constraints that damp its

effects on the society and its ecosystem. Many of these constraints are set as a part of development. This hypothesis will be explored by extending the current models of the evolution of communication, of primate social behaviour, and of individual learning.

The idea of this research is to model existing learning and development in primate species other than humans, such as orangutans (van Schaik et al., 2003) and capuchins (Perry et al., 2003). By looking at the range of behaviours that are theoretically possible and examining where within this range modern non-human primates exist, we can learn about the evolved mechanisms for controlling cultural evolution. This work could ultimately have substantial impact on our understanding of human culture and development.

## 2.5 Gastwissenschaftler Visiting Scientists

**Dr. Thomas R. ALLEY**

Dept. of Psychology, Clemson University, Clemson CS, USA  
(May - June 2007)



*Thomas Alley is Professor of Psychology at Clemson University, South Carolina. He earned his BA (philosophy) and BS (psychology) degrees in his home state at Pennsylvania State University. He completed his graduate education (MA, PhD) at the University of Connecticut in Experimental Psychology. His Masters Thesis was an experimental test of a conjecture by Konrad Lorenz of a kindchenschema. His more recent research is mostly concerned with [1] social and applied aspects of human physical appearance, [2] the psychology of eating, and [3] human perception and memory. After completing his PhD, he spent three years as an N.I.H. Postdoctoral Fellow in the Human Growth Center at the University of Connecticut School of Dental Medicine. He has been a Visiting Scholar and a Visiting Professor at Emory University. Tom Alley is Editor of the Human Ethology Bulletin.*

### Evolutionary Perspectives on Human Food Sharing

#### Evolutionäre Aspekte des Nahrungs-Teilen

Food sharing is a common and widespread human behavior that can seem difficult to explain but which seems likely to be used in the formation and maintenance of heterosexual attraction. However, there is remarkably little research on this phenomenon. Even though nepotistic food sharing that has been the focus of much research, theory and speculation, the role of food sharing in sexual attraction, mating and bonding has been largely ignored.

The project will identify specific food sharing behaviors that are expected to contribute to heterosexual attraction and bonding.



Evolutionary theory, existing studies of animal behavior (particularly those of social primates), and the limited existing data on humans will be used to identify these expectations.

Taxonomies based on both motivational and behavioral aspects of food sharing will be prepared to support the development of a model of food sharing behaviors as contributors to the processes of heterosexual attraction, mate access and bonding. Thus this to-be-developed model of food sharing behaviors in humans will specifically target food sharing that may contribute to sexual attraction, the formation and maintenance of mating bonds, or other aspects of intrasexual competition.

The taxonomies and model will serve as guides for interpretation of existing observational and empirical findings and for future research. Specific predictions of human food sharing will be derived from the model. Eventually, observational, correlational and experimental studies will be designed to test predictions derived from the model.



**Dr. Mark H. BICKHARD**

Lehigh University, Bethlehem, PA, USA  
(June 2007)

*Mark H. Bickhard has been at Lehigh University since 1990 as the Henry R. Luce Professor of Cognitive Robotics and the Philosophy of Knowledge (a position created by Donald Campbell). He holds a BS in mathematics, a MS in statistics, and a PhD in human development, all from the University of Chicago. Dr. Bickhard was at the University of Texas at Austin from 1972 to 1990. His interests include theoretical psychology and several related fields, including theoretical biology, both evolutionary and neuroscience, and multiple areas in philosophy. He is the editor of the journal *New Ideas in Psychology*.*

**The Brain Doesn't Work That Way: From Microgenesis to Cognitions**

**Das Gehirn funktioniert anders: Von der "Microgenese" zur Wahrnehmung**

The functioning of the brain cannot be understood in terms of neurons as threshold switches. Neurons don't work that way, and, in addition, neurons are not the only functional units in the brain. When we look at how the brain actually functions, we find strong support for an alternative — microgenetic — model of central nervous system functioning. Microgenesis, in turn, has strong implications for the nature of representation and cognition. It forces an interactive, pragmatic model of representation.

**ALIRIO ROSALES**

University of British Columbia, Vancouver, Canada  
(July 2007)



21

*Alirio Rosales is currently finishing his PhD work (supervised by Prof. John Beatty) at the University of British Columbia, Vancouver. He previously taught philosophy of biology at the Universidad Central de Venezuela.*

**Understanding Adaptation: Why Stability?****Zum Verständnis der Anpassung: Wozu Stabilität?**

The role of optimality models in the study of adaptation has been a focus of continued foundational debate in evolutionary biology. Nevertheless, a central question at the core of the debate has been explicitly addressed only recently: the issue of evolutionary stability, which conceptually unifies research in fields like life-history evolution, behavioural evolution, and phenotypic plasticity, to name a few. What is the theoretical force of the notion of stability in the study of adaptation? Is it a theoretical virtue of evolutionary modeling, or a vice?

I will argue that it is a virtue. But to properly address these questions one needs to distinguish theoretical understanding from explanation. Indeed, I see theoretical understanding as a necessary — but insufficient — condition for explanation. We have theoretical understanding when phenomena become intelligible to us, that is, in a crucial sense, conceptualizable, and such conceptualization is a requisite for explanation. Thus, modeling adaptation through a notion of stability has made adaptive evolution intelligible as a biological phenomenon. I develop this thesis by interpreting recent results in the biological literature and by giving an old idea of Richard Levins foundational significance as a principle for the intelligibility of adaptation: that populations in nature should differ in the direction of their optima.

## Wissenschaftliche Veranstaltungen Meetings and Lectures



*Das KLI fördert internationale Workshops, Symposien, Vortragsreihen und Einzelvorträge, die entweder vom KLI organisiert werden oder in Kooperation mit anderen Institutionen stattfinden.*

### 3.1 Altenberg Workshops in Theoretical Biology

Die „Altenberg Workshops“ befassen sich jeweils mit einer Schlüsselfrage der biologischen Theorie. Jeder Workshop wird von führenden Fachleuten auf dem jeweiligen Gebiet organisiert, die eine Gruppe internationaler Experten als Teilnehmer einladen. Die daraus resultierenden Bücher werden von MIT Press im Rahmen der „Vienna Series in Theoretical Biology“ herausgegeben. Die Altenberg Workshops haben das Ziel, konzeptionelle Fortschritte und Forschungs-Initiativen mit deutlich interdisziplinärem Charakter zu generieren. Weitere Informationen zu den Teilnehmern und ihren Vorträgen stehen auf der KLI Website zur Verfügung.



#### 16th Altenberg Workshop in Theoretical Biology 19-22 July 2007

##### The Major Transitions Revisited

Organization: Brett Calcott and Kim Sterelny  
(Australian National University)

#### The topic

It is now ten years since John Maynard-Smith and Eörs Szathmáry published their *The Major Transitions in Evolution*. That monograph developed an overall framework for understanding the evolution of life. Maynard-Smith and Szathmáry understood the evolution of complexity as the coupling of two processes: an expansion of the mechanisms of heredity, as richer and more accurate systems of the intergenerational flow of information evolved, and as the evolution of new levels of biological individuality, as previously independent lineages in Darwinian populations came to share their evolutionary fate. The time is ripe for a workshop assessing and developing their framework, and comparing it to others. For there are now available much better confirmed phylogenies of the major branches of the tree of life; the fossil record, likewise, is much better known and understood, and there have been important developments in evolutionary theory; in particular, on integrated evolutionary and developmental biology and in the development of multi-level theories of selection. Both these are of special importance to the major transitions; especially those involving transitions to multicellularity.

LINDELL BROMHAM

(Centre for Macroevolution and Macroecology, Australian National University, Canberra, Australia):

**DNA and Deep Time: What, if Anything, can Molecular Data tell us About the Cambrian Explosion?**

BRETT CALCOTT

(Centre for Macroevolution and Macroecology, Australian National University, Canberra, Australia):

**Internal Signaling and the Division of Labour**



24 PETER GODFREY-SMITH

(Department of Philosophy, Harvard University, Cambridge MA, USA):

**Darwinian Populations and Transitions in Individuality**

BEN KERR

(Department of Biology, University of Washington, Seattle, WA, USA):

**Setting the Stage for a Major Transition: The Evolution of Restraint in Structured Populations**

ANDREW H. KNOLL

(Department of Earth and Planetary Sciences, Harvard University, Cambridge MA, USA):

**The Early Evolution of Multicellular Organisms: Phylogenetic, Geologic, and Functional Perspectives**

MICHAEL LACHMANN

(Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany):

**Evolution and Information**

RICK MICHOD

(Department of Ecology & Evolutionary Biology, The University of Arizona, Tucson AZ, USA):

**Evolution of Individuality During the Transition From Unicellular to Multicellular Life**

SAMIR OKASHA

(Department of Philosophy, University of Bristol, Bristol, U.K.):

**Evolutionary Transitions, Levels of Selection, and Cross-Level Byproducts**

ALIRIO ROSALES

(Department of Philosophy, University of British Columbia, Vancouver, Canada):

**What's an Evolutionary Transition? Causal Dependence, Adaptation, and Evolvability**

CARL SIMPSON

(Department of Biology, Duke University, Durham NC, USA):

**Empirical Insights into Multilevel Selection through Transitions from Solitary to Colonial Organisms**

KIM STERELNY

(Centre for Macroevolution and Macroecology, Australian National University, Australia and Philosophy Program, Victoria University of Wellington):

**Evolvability Reconsidered**

EÖRS SZATHMÁRY

(Collegium Budapest, Budapest, Hungary):

**In silico Evolutionary Developmental Neurobiology and the Origin of Natural Language**



## 17th Altenberg Workshop in Theoretical Biology 13-16 September 2007

### Innovation in Cultural Systems: Contributions from Evolutionary Anthropology

Organization: Michael J. O'Brien (University of Missouri)  
and Stephen J. Shennan (University College London)

#### The topic

It would be difficult to find another topic in anthropology that has played as important a role as innovation in structuring arguments concerning why and how human behavior changes. Certainly innovation was implicit in the 19th-century writings of ethnologists such as Edward Burnett Tylor and Lewis Henry Morgan, just as it was in the mid-20th-century work of Julian Steward and Leslie White. For Tylor and Morgan the appearance of cultural innovations was almost a preprogrammed process, which kicked in whenever a cultural group „needed“ to ascend the ladder of sociocultural complexity. Adolf Bastian explained it this way: „the psychic unity of mankind constantly impelled societies to duplicate one another's ideas“. For Steward and White the process was less orthogenetic, with the source of innovation wrapped up in the kind of mechanisms a group needed to meet the challenges of its physical and social environment.

Archaeological explanations of cultural change, too, have long centered around the introduction and spread of novelties. American culture historians of the 20th century routinely looked to diffusion and trade as a source of innovations, in the process usually adopting without comment the models of their anthropological colleagues as to how and why the innovations arose in the first place. This is the way that James Ford, a leading archaeologist of the mid-20th century, put it: „Archeologists have shown little interest in examining the philosophic bases of their studies. While utilizing the thesis that trait resemblances (in adjacent geographic regions) are evidence for contact, when faced with an unexplainable origin of a trait they have fallen back on independent invention theory“ (Ford 1969).

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



26 ANDRÉ ARIEW

(Department of Philosophy, University of Missouri, Columbia, Missouri, USA):

**Invention vs. Innovation From a Darwinian Point of View**

ALEXANDER BENTLEY

(Department of Anthropology, Durham University, Durham, England):

**Characterizing Innovation Using the Random Copying (Neutral) Model**

WERNER CALLEBAUT and GERD B. MÜLLER

(KLI and Department of Theoretical Biology, University of Vienna, Austria):

**Innovation from EvoDevo to Human Culture**

MARK COLLARD, BRIGGS BUCHANAN, and JESSE MORIN

(Dept. Archaeology, Simon Fraser University; Dept. Anthropology, Univ. of British Columbia):

**Risk and Hunter-gatherer Technological Innovation**

JOSEPH HENRICH

(Dept. Psychology and Dept. Economics, University of British Columbia, Vancouver):

**Why Societies Vary in their Rates of Innovation: The Evolution of Innovative-enhancing Institutions**

MARK LAKE and JAY VENTI

(Institute of Archaeology, University College London):

**The Exploration of Bicycle Design Space**

KEVIN N. LALAND

(School of Biology, University of St. Andrews, St. Andrews, Scotland):

**The Evolution of Innovation**

DANIEL O. LARSON

(Department of Anthropology, California State University Long Beach, California, USA):

**Phenotypic Plasticity and Evolvability:**

ALEX MESOUDI

(W. Maurice Young Centre for Applied Ethics, Univ. of British Columbia, Vancouver, Canada):

**Simulating Cultural Innovation in the Psychology Lab**

MICHAEL J. O'BRIEN

(Department of Anthropology, University of Missouri, Columbia, Missouri, USA):

**An Introduction to Cultural Innovation**

CRAIG T. PALMER

(Department of Anthropology, University of Missouri, Columbia, Missouri, USA):

**Cultural Traditions and the Evolutionary Advantages of Non-Innovation**

VALENTINE ROUX

(Préhistoire et Technologie, Maison de l'Archéologie et de l'Ethnologie, Nanterre cedex, France):

**Technological Innovations, Developmental Trajectories and Techno-Economic Impact: Modes of Social Organization as Evolutionary Forces**

JEFFREY H. SCHWARTZ

(Department of Anthropology, University of Pittsburgh, Pittsburgh, USA):

**Not all Biological Innovations are the Same: Systematics versus Phylogeny**

STEPHEN J. SHENNAN

(Institute of Archaeology, University College London, London, England):

**Inventing the Wheel?**

ANNE KANDLER and JAMES STEELE

(Institute of Archaeology, University College London, London, England):

**Innovation Diffusion in Time and Space: Social Learning and Threshold Heterogeneity Models**

ADAM POWELL, STEPHEN SHENNAN, and MARK G. THOMAS

(Department of Biology and Department of Archaeology, University College London):

**Demography and the Accumulation of Culturally Inherited Skills**

TODD L. VANPOOL

(Department of Anthropology, University of Missouri, Columbia, Missouri, USA):

**War, Women, and Religion: The Spread of Salado Polychrome in the US Southwest**

## 3.2 Symposien Symposia organized or co-organized by the KLI

### Symposium in Honor of Werner Leinfellner

31 January 2007

WERNER LEINFELLNER

**The Theory of the Somatic-Neuronal Origin of Values –  
Interconnections of Time and Valuation**

JOHANN GÖTSCHL

(Institut für Philosophie, Universität Graz):

**Zu Werner Leinfellners Konzept des „Evolutionären Denkens“**

SIMON HUTTEGGER

(KLI):

**The Importance of Dynamics for Models of Social Systems**

ERHARD OESER

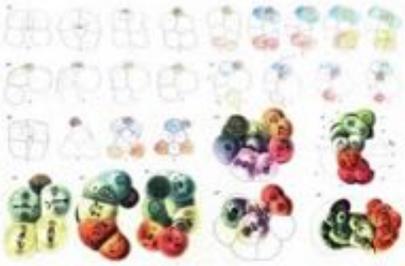
(Institut für Wissenschaftstheorie, Universität Wien):

**Evolution of Morality and Law**

MANFRED WUKETITS

(Institut für Wissenschaftstheorie, Universität Wien):

**Werner Leinfellners Pionierleistungen in der Erkenntnis- und Wissenschaftstheorie**



**Workshop at the Stazione Zoologica Anton  
Dohrn, Naples (Italy)  
17-20 May 2007**

**Graphing Genes, Cells and Embryos**

*Organization: Sabine Brauckmann (Estonian University of Life Sciences, Estonia), Christina Brandt (MPI for the History of Science, Germany), Denis Thieffry (Université de la Méditerranée, France), Gerd B. Müller (University of Vienna), the Stazione Zoologica Anton Dohrn, Italy, and the KLI*

**The topic**

An important feature of the life sciences is that they always have visualized their objects to a greater extent than physics or chemistry. Since the early 19th century one extensively used hand-drawings, professional illustrations, idealized diagrams, microphotography, and, in the 20th century, time-lapse motion pictures to visualize the data and to support one's own analyses.

Nowadays the techniques expanded to video and digital imaging, including virtual reality dissections and rotating panoramas of embryonic features. In general, these scientific images are means to store and exchange experimental data and to further specialized knowledge of biological objects. The objects are either an individual, like an embryo or egg, a cell or gene, or sets of individuals like animals, plants, forests, or meadows. What distinguishes them from physical entities are the facts that they are visually flexible phenomena whose boundaries, extension and identifying details are studied to explain life's dynamics and such processes like embryogenesis, cell morphologies, or genes' networking.

To capture this visual specificity of the life sciences, the workshops will focus (1) on the biological material considered in priority, e.g. embryos, cells, and genes, (2) on the type of graphical representations used, e.g. fate maps, cell lineages, or gene networks, and (3) on the techniques employed to construct these graphs, e.g. hand drawings, diagrams, tables, microphotographs, time-lapse motion pictures, or computer imaging.

This workshop brings to an issue the production of biological knowledge on embryos, cells, and genes from the early 19th to in silico biology. For it, we will compare the graphic models of classical disciplines evoking lifelike images within the mind, like embryology and cytology to most recent computer imaging techniques. In terms of methodology we foster true interdisciplinary work and communication, in particular combining experts from the biological sciences and the humanities (history and philosophy of sciences).

Our discussions will serve several objectives. For example, we will study biological objects and follow their traces in different disciplines over time, we will examine the tools by which biologists visualized their observations, and how they trained themselves to „observe“ and to „imagine“ the phenomenal forms of biological bodies. Further we will elucidate in detail which experimental procedures schooled the scientists to coordinate eyes and hands when redrawing over and over again images of cells pushing against each other, or fixing the boundaries of embryonic layers, permanently moving and shifting their position inside an embryo.

Other epistemic questions we want to address here are how the ‚graphs‘ relate to the experiments in question, or how the images changed when more data accumulated. For, the workshops attempt to underline the role of images as a vehicle of how the scientists comprehend the object or phenomenon in question, and of how they differentiate or unify biological diversity in coherent theories. Indeed, scientific images do not map experimental reality in a one-to-one correspondence because they result from a complex process of production and transformation. In other words, scientific images are models.

During the workshops biologists and scholars of science studies will elucidate to what extent the images have served and still serve the biologists to perceive and to cognize living entities. Thus, we will also talk in detail on the scientist’s perceptive habit and the ambiguity of observing epistemic objects, which are at the same time subjects changing their shape in time and space. The interdisciplinary participants will offer a variety of foci when presenting the practice of scientific visualization, discussing the function and mode of visual representation, or delimiting the role that images can play in accepting a new „theory“. Further, we will explore the emergence of novel graphical representation strategies to cope with very large sets of experimental data produced by functional genomic approaches. Scientists involved in the growing field of systems biology particularly stress the need for efficient representation and modelling to enable the required interdisciplinary cooperation. In the process, several other aspects are alluded to, e.g. the credibility of the experimenter, or the visibility and communicability of science.

The biological scientists will present their own research on the mechanism that coordinate cell movements with gene expression, on gene regulatory networks, on the patterning of cell lineages, or on the evolution of morphological characters. They will exemplify which tools they use, e.g. hand drawings, diagrams, statistical tables, scanning electron microscopy, video laser, digital imaging, or the formal graphical representation. They will unravel how they analyze their data, conceptualize their mental images, and formulate „theories“. Each „biological“ presentation will be backed up by a historical and/or philosophical one, either showing the continuity of research issues and biological theories, or pointing out the distinctions to studies of the life sciences of the 19th and 20th century.

Tentatively, the analyses presented in these workshops will contribute to the development of a grammar of visual representation in the life sciences. In any case, the universa in picto and their fabrication from a period of nearly 200 years will constitute the common theme.

NANCY ANDERSON

(Department of Visual Studies, 202 Center for the Arts, University at Buffalo, Buffalo, NY, USA):

**Imaging the Virus of a Shell: Modern Architecture as an „Anticipatory Key“ to Understanding Virus Structure**

HAMID BOLOURI

(Institute for Systems Biology, Seattle, WA, USA):

**Interpreting 4D Developmental Data**

SABINE BRAUCKMANN

(Centre for Science Studies, Estonian University of Life Sciences, Tartu, Estonia):

**On Fate and Specification**



30 SORAYA DE CHADAREVIAN  
(UCLA Center for Society and Genetics, Los Angeles CA, USA):

**Visualising Human Chromosomes, 1950-1970**

ARIANE DRÖSCHER

(Dipartimento di Biologia evolutiva sperimentale, Università degli Studi di Bologna, Italy):

**From the 2D Image of the Golgi Apparatus to its 3D Model**

ERNA FIORENTINI

(Max Planck Institute for the History of Science, Berlin, Germany):

**Observation and Judgement. Why did a Prism matter in Microscopical Drawing?**

MAURA C. FLANNERY

(Center for Teaching and Learning, St. John's University, New York, USA):

**Picturing RNA**

SCOTT F. GILBERT

(Department of Biology, Swarthmore College, Swarthmore PA, USA):

**„The Textbook Account“: How Textbooks represent Developmental Phenomena**

DAVID GOODING

(Science Studies Centre, University of Bath, Bath, UK):

**Visualization and Visual Modelling in Biology and Beyond**

DAVID S. GOODSSELL

(Department of Molecular Biology, The Scripps Research Institute, La Jolla, CA, USA):

**Visual Methods from Atoms to Cells**

CHRISTIANE GROEBEN

(History of Science Unit and Historical Archives, Stazione Zoologica Anton Dohrn, Naples, Italy):

**Science Joins the Arts: The Collection of Watercolours and Drawings of Marine Organisms At the Stazione Zoologica Anton Dohrn**

TIMOTHY HERMAN

(Center for BioMolecular Modeling, Milwaukee School of Engineering, Milwaukee WI, USA):

**Tactile Teaching: Using Physical Models to Explore Protein Structure/Function**

PATRICK LEMAIRE

(Université de la Méditerranée, Campus Scientifique de Luminy, CNRS, Marseille cedex, France):

**Virtual 3D Embryos and their Contribution to Understanding Developmental Processes**

MICHEL MORANGE

(Centre Cavaillès d'histoire et de science, Département de Biologie, ENS, Paris, France):

**Evolving Representations of Gene Regulation and Cell Signalling Pathways and Networks 1960-2007**

LAURA PERINI

(Philosophy Department, Virginia Tech, Blacksburg, VA, USA):

**Diagrams and Theoretical Content**

ANYA PLUTYNSKI

(Department of Philosophy, University of Utah, UT, USA):

**The Rise and Fall of the Adaptive Landscape**

MARIA C. RIVERA

(Center for Complexity, Virginia Commonwealth University, Richmond, VT, USA):

**From Bifurcating Trees to a Cycle Graph: The Ring of Life**

JUDY JOHNS SCHLOEGEL

(Argonne National Laboratory, Argonne, IL, USA):

**Envisioning a new Science: Representing Heredity in Early Genetics Research, 1900-1919**

STÉPHANE SCHMITT

(Université Denis-Diderot, Paris, France):

**Pander, d'Alton and the Representation of Epigenesis**

CLAUDIO C. STERN

(Department of Anatomy & Developmental Biology, University College London, London, UK):

**From Fate Maps to Embryo: The Magic of Gastrulation**

DENIS THIEFFRY

(Université de la Méditerranée, Marseille Cedex, France):

**Genetic Regulatory Graphs as Computational Research Tools**

TIFFANI L. WILLIAMS

(Dept Computer Science, Texas A&M University, TX, USA):

**The Landscape of Life**

**Statistical Approaches to Inference of Selection  
Workshop  
10-14 December 2007, KLI Altenberg**

*Organization: Reinhard Bürger (University of Vienna)*

*Sponsored by WWTF, KLI, and Department of Statistics (University of Vienna)*

SIMON BOITARD and ANDREAS FUTSCHIK

**New Methods for Detecting Selective Sweeps based on Hidden Markov Models and Support Vector Machines**

JEFF JENSEN

**On Identifying Targets of Positive Selection in Non-Equilibrium Populations**

HAIPENG LI

**Recent Positive Selection Enriched in Regions Close to Brain-related Genes in the Human Lineage**



32 GIL MCVEAN  
**Approximate Genealogical Inference**

PETER PFAFFLHUBER  
**Approximating Genealogies under Selective Sweeps**

MOLLY PRZEWORSKI  
**Computational Approaches to the Study of Speciation**

GUY SELLA  
**Genomewide Spatial Correspondence between Nonsynonymous Divergence and Neutral Polymorphism Reveals Extensive Adaptation in *Drosophila***

KUN TANG  
**A New Approach for Using Genome Scans to Detect Recent Positive Selection in the Human Genome**

THOMAS WIEHE  
**Frequency Spectrum of Segregating Sites and Genetic Variability under (i) Variable Population Size and (ii) Epistatic Fitness Interactions**



**Vienna Conference on Consciousness 2007  
5 October 2007**

*Organization: Faculty of Life Sciences, Faculty of Philosophy and Educational Sciences, KLI, Wissenschaftsförderung der Stadt Wien*

J. ALLAN HOBSON  
(Harvard University):  
**What is the Relationship of Consciousness to Brain Activity?**

JOHN KIHLLSTROM  
(University of California Berkley):  
**What Revisions are Necessary in Scientific Models of Unconscious Mental Activity?**

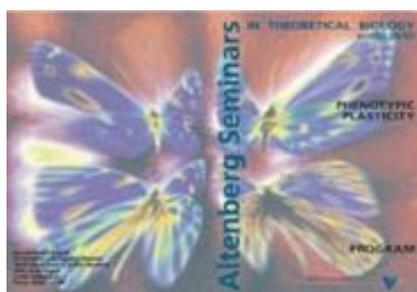
HELLMUT WOHL  
(Professor Emeritus Boston University and Consultant to Gulbenkian Foundation, Portugal):  
**Is Creativity an Automatic?**

STEVEN LAUREYS  
(University of Liège):  
**What does Neurological Disease Teach us about Consciousness?**

### 3.3 Altenberg Seminare in theoretischer Biologie

Die „Altenberg Seminare in theoretischer Biologie“ greifen im Rahmen einer Vortragsreihe jedes Semester ein Thema von wissenschaftlicher und philosophischer Bedeutung auf. Die Vorträge werden an der Universität Wien abgehalten, die Folge-Diskussionen finden am jeweils darauffolgenden Tag am KLI statt. Die Seminarreihe soll neben dem Fachpublikum auch die wissenschaftlich interessierte Öffentlichkeit erreichen. Weitere Informationen zu den Teilnehmern und ihren Vorträgen stehen auf der KLI Website zur Verfügung.

33



#### Altenberg Seminars in Theoretical Biology Winter 2006/2007

#### Phenotypic Plasticity

In a letter to the Würzburg zoologist Karl SEMPER (1832-1893), the author of a groundbreaking book on animal ecology, Charles DARWIN (1881) speculated „whether a species very liable to repeated and great changes of conditions might not assume a fluctuating condition ready to be adapted to either condition. The problem facing organisms that have to track changing environments repeatedly — say, seasonally — by genetic differentiation is comparable to that of „a military general always planning for the last war“, because the genetic composition of a population reflects the selective regime of the previous season. The evolution of phenotypic plasticity (PP), viz., „the property of a given genotype to produce different phenotypes in response to distinct environmental conditions“ allows to solve this problem.

Thus, seasonal polyphenism (e.g., in butterflies), the adaptation of alternative phenotypes (‘morphs’) to the particular seasonal environment in which they spend all or most of their adult lives, can reduce the time lag (‘load’) of response under certain favorable conditions, viz., individuals equally competent to make correct developmental ‘decisions’ and ‘trustworthy’ environmental cues). When viewed as a source of variation within a generation, PP can be visualized by means of norms of reaction, i.e., functions describing the response of a genotype to a quantitative environmental manipulation. Using a reaction norm, the reactions of several genotypes to the same environmental manipulation can be compared. From an evolutionary point of view, PP is a consequence of a genotype coding not for a fixed phenotype, but for a reaction norm. It may thus be contrasted with canalization, by which a genotype yields similar phenotypes in different environments and developmental factors restrict variation in the final phenotype.

At the same time, PP allows to explain a number of mechanisms involved in the control of development and in the interactions between gene expression, epigenetic factors, and the environment during ontogeny. In developmental biology, PP — which developmental plasticity presupposes — helps us to understand how developmental pathways can be mediated in response to environmental stimuli and hence provide different phenotypic options. In order to examine and measure PP at the level of individual organisms, it has to be defined as „any change in an organism’s characteristics in response to an environmental signal“. This definition and PIGLIUCCI’s are mutually exclusive: When PP is defined in terms of a norm of reaction, it must be calculated by determining the mean



34 phenotype manifested by a group of individuals of the same genotype at each level of the environmental manipulation, and hence cannot be measured on individual organisms. In addition to different time scales (across or within generations), the meaning of 'PP' may also differ depending on whether the variation is among or within populations, and on whether environmental change and organismal response are continuous or discrete, and reversible or irreversible. Nonetheless, many authors argue that PP should be „broadly construed to encompass a diversity of phenomena spanning several hierarchical levels of organization,“ starting from underlying shared processes at the cellular level, among others, have begun to provide a common framework to bring the different categories of PP together, and articulate perspectives on adaptation that reversible types of plasticity might provide. We also note that not all PP is adaptive, as it sometimes may represent an inability to eliminate developmental instability.

WEST-EBERHARD's one sentence summary of her magnificent book, *Developmental Plasticity and Evolution*, aptly seizes the importance of PP for EvoDevo: „The universal environmental responsiveness of organisms, alongside genes, influences individual development and organic evolution, and this realization compels us to reexamine the major themes of evolutionary biology in a new light“. PP may concern morphology, life history, behavior, physiology, etc.; it is „now known to be a source of enormous developmental, physiological, and life-history variation in a broad spectrum of organisms“. NIJHOUT does not hesitate to call PP „the primitive character state for most if not all traits.“ Instead of variation for plasticity being considered as a nuisance in evolutionary studies, it has become a main target of investigations that use an array of methods, including quantitative and molecular genetics, and several approaches that model the evolution of plastic responses. KOPP, and PIGLIUCCI in particular, will survey these recent developments, and assess in which areas progress has been made, and where additional effort is required.

SULTAN's seminar will discuss methodological difficulties with conventional approaches to testing the adaptive value of traits that arise because of the environmental sensitivity of phenotypic expression, and focus on comparative plasticity experiments with annual plant species in the genus *Polygonum* as a pluralistic alternative.

LEIMAR will argue that, from the viewpoint of a developmental switch, genetic morph determination can function as adaptive developmental plasticity by providing developing individuals with information about the likely success of phenotypic alternatives. Just as adaptive PP is a developmental response to environmental cues that predict future selective conditions, genetic polymorphism may be viewed as a developmental response to genetic cues, in the form of selectively maintained gene frequency differences between population segments — a 'conditional strategy' in game-theoretic terms.

KOPP will give an overview of PP in predator-prey systems in which predation-related adaptations often involve costly investments, an issue that is currently at the forefront of research and that will also be discussed by PIGLIUCCI. This has led to the evolution of phenotypically plastic responses to specific prey or predators — 'inducible defenses'; plastic adaptations of predators to prey are called 'inducible offenses'. Theoretical models are needed to understand the evolution of both as well as of their ecological consequences.

BRAKEFIELD will report on the research of his team on *Bicyclus* butterflies in Africa, which exhibit seasonal polyphenism with alternating adult generations of wet and dry

season forms. This divergence has led them to examine the bases of the PP in wing pattern in a model species, *B. anynana*, as well as the evolution of key life history traits including adult starvation resistance and longevity. A major goal of their framework is to gain a better understanding of the contributions of both developmental bias and natural selection to shaping the patterns among species in their occupancy of morphological space.

SONIA E. SULTAN

(Department of Biology, Wesleyan University, Middletown, CT, USA):

**Phenotypic Plasticity and Adaptive Interpretation: A Case Study in Annual Plants**

OLOF LEIMAR

(Department of Zoology, Stockholm University):

**Unifying Genetic Polymorphism and Phenotypic Plasticity**

MICHAEL KOPP

(Section Evolutionary Biology, University of Munich):

**Phenotypic Plasticity in Predator-Prey Interactions**

MASSIMO PIGLIUCCI

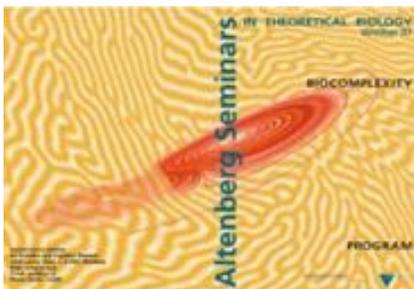
(Department of Ecology & Evolution, SUNY-Stony Brook, NY, USA):

**What Do We Know About Phenotypic Plasticity?**

PAUL BRAKEFIELD

(Institute of Biology, University of Leiden, The Netherlands):

**Evo-devo of Eyespots: Developmental Plasticity in *Bicyclus* Butterflies as a Response to Alternating Seasons**



**Altenberg Seminars in Theoretical Biology  
Summer 2007**

**Biocomplexity**

The relationship between the growth rate (annualized biomass production) and body size of plants is scale-invariant over 20 orders of magnitude in body size. This is true of single-celled algae and aquatic ferns as well as of conifers, including the giant sequoia, and turns out to be indifferent to both habitat and phylogenetic affiliation. Outbreaks of cholera in Bangladesh closely track Pacific warming, which is largely associated with El Niño-Southern Oscillation weather patterns. Long-term weather patterns reflecting global warming affect the distribution of species (for instance, certain nonmigratory butterflies in Europe) across space and time.



36 Classical science typically minimizes the number of independent variables and interference from „external“ factors to keep research tasks manageable and fundable. What distinguishes the aforementioned instances of integrative biocomplexity research from reductionistic science is their relevance for organisms ranging from unicellulars to humans and for environments ranging „from polar regions to volcanic vents to tropical forests to agricultural lands to urban centers“. Biocomplex interactions tend to span multiple hierarchical levels, with their emergent properties, from genes to the biosphere, and are often reflected in nonlinear, chaotic, and unpredictable behaviors.

The analysis of complex data sets representing physical, chemical, biological, behavioral, and social interactions across many scales of resolution can result in novel predictions that are potentially useful to scientists, resource managers, and policy makers in multiple ways. Biocomplexity research draws on advances in geometry, topology, graph theory, control theory for chaotic systems, and in techniques for modeling uncertainty, and on sophisticated simulation methods, among others. It may require interdisciplinary collaborations among disciplines as disparate as oceanography and epidemiology, using, for instance, remote sensing for the indirect detection of cholera bacteria.

MICHENER et al. define biocomplexity as „properties emerging from the interplay of behavioral, biological, chemical, physical, and social interactions that affect, sustain, or are modified by living organisms, including humans.“ Viewed this way, biocomplexity research is closely related to computational biology, which has been defined as „the development and application of data-analytical and theoretical methods, mathematical modeling and computational simulation techniques to the study of biological, behavioral, and social systems“.

This Altenberg Seminar will document biocomplexity at work at the levels of the cell, the brain, and evolving populations in their environmental settings, including host-parasite coevolution. These „intra-level“ approaches will be complemented by cross-level accounts of the emergence of global structural patterns (including morphogenesis) from the nonlinear interactions between constituent elements.

John BEGGS, an applied physicist turned neuroscientist, will review experiments on networks of cortical neurons that appear to be operating at the „edge of chaos“ and argue that criticality may allow cortical networks to optimize information processing.

The experimental and theoretical biologist Frank BRUGGEMAN will illustrate approaches to network analyses (structural models) and analyses of cellular dynamics (kinetic models) for prokaryotic and eukaryotic networks, and discuss principles of network functioning from the perspective of a working systems biologist.

Throughout her career, theoretical biologist Paulien HOGEWEG has used information-theoretic tools to understand biotic systems at many interconnected levels. In the 1970 she identified the study of information processes in biotic systems as an open and promising research area, for which she coined the term „bioinformatics.“ Today, the term is often used more narrowly to refer only to issues dealing with the management of genome project sequencing data, but HOGEWEG's original usage largely coincides with what the U.S. National Science Foundation in 1999 called „biocomplexity“ (cf. MERVIS 1999). She will survey (inter alia) eco-evolutionary models in which local interactions between

replicators lead to pattern formations, and discuss how the dynamics of these patterns influence the evolutionary dynamics of the replicators as well as complex regulatory systems and morphogenesis to tackle the basic questions, „How does biocomplexity evolve?“ and „How can we model complex biological systems?“

To round off the seminar, the distinguished bacteriologist, geneticist, and oceanographer Rita COLWELL, using the case of cholera as a paradigm for global infectious diseases, will show how many such diseases are intricately related to weather patterns, climate, and seasonality. She will discuss how studies that integrate satellite sensing technology, ground truth measurements, and microbiological analyses provide the basis for predictive modeling of cholera epidemics in Middle Asia and East Africa.

The aims of biocomplexity research are not only theoretical but also eminently practical: „It is not enough to explore and chronicle the enormous diversity of the world’s ecosystems. We must do that — but also reach beyond, to discover the complex chemical, biological, and social interactions in our planet’s systems. From these subtle but very sophisticated interactions and interrelationships, we can tease out the principles of sustainability“.

JOHN M. BEGGS

(Biocomplexity Institute, Department of Physics, Indiana University, Bloomington, IN, USA):

**The Criticality Hypothesis: How Local Cortical Networks Might Optimize Information Processing**

FRANK BRUGGEMAN

(Manchester Centre for Integrative Systems Biology, Manchester Interdisciplinary Biocentre, and Department of Molecular Cell Physiology, Vrije Universiteit Amsterdam):

**Tracing Life Emergence to Its Molecular Mechanisms and Back**

PAULIEN HOGEWEG

(Theoretical Biology and Bioinformatics group, Utrecht University, The Netherlands):

**Multilevel Evolution and Biocomplexity**

ASTERO PROVATA

(Statistical Mechanics and Nonlinear Dynamics Laboratory, Institute of Physical Chemistry, National Center for Scientific Research „Demokritos,“ Athens, Greece):

**Complexity and Correlations in the Primary Structure of DNA**

RITA R. COLWELL

(University of Maryland College Park, Johns Hopkins University Bloomberg School of Public Health, and Canon U. S. Life Sciences, Inc.):

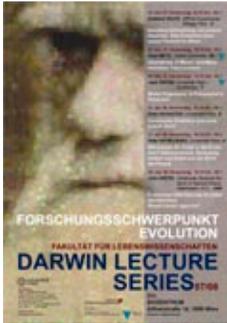
**Global Climate and Human Health: The Cholera Paradigm**



### 38 3.4 Beiträge zur Darwin Lecture Series

#### Forschungsschwerpunkt Evolution, Universität Wien

Lectures sponsored by the KLI:



DAN SPERBER

(Institut Jean-Nicod [CNRS, EHESS, ENS]):

**Modularity and Relevance in Cultural Evolution**

JEAN GAYON

(Université Paris 1-Panthéon Sorbonne & Institut d'Histoire et de Philosophie des Sciences et Techniques):

**Model Organisms in Biology and Medicine: A Philosopher's Viewpoint**

### 3.5 Mittagsdiskussionen Brown Bag Discussions

*„Brown bag“ bezieht sich auf das informelle Format dieser öffentlichen Vorträge: bringen Sie Ihr Mittagessen mit, lehnen Sie sich zurück, genießen Sie den Vortrag und nehmen Sie an der Diskussion teil! Die „Brown Bag Discussions“ finden mittags in der Bibliothek des KLI in Altenberg statt. Die Abstracts zu den Vorträgen und Informationen zu den Vortragenden stehen auf der Instituts-Website zur Verfügung.*

CHRISTIAN PÄZMÄNDI

(Medical University of Vienna):

**The Morphospace Surrounding the Fin-Limb Transition**

JOERI WITTEVEEN

(London School of Economics):

**The Replicator Concept in Evolutionary Theory**

ARTURO CARSETTI

(Università degli studi di Roma - Tor Vergata):

**Embodied Cognition and the Emergence of Mind**

CAMILO CELA CONDE

(Universidad de las Islas Baleares):

**The Evolution of Human Values: Taking Natural Selection Seriously**

ELIAS KHALIL

(Monash University):

**Why Natural Selection Cannot Explain Rationality**

KONRAD TALMONT-KAMINSKI  
(KLI and Marie Curie Skłodowska University):

**What is This Thing Called Superstition?**

PAOLA HERNÁNDEZ CHÁVEZ  
(KLI):

**Reductionism in Some Naturalized Epistemologies: The Case of Localizationism in Neuroscience**

DAVIDE VECCHI  
(KLI):

**Two Challenges for Evolutionary Epistemologies Based on Selection Theory**

PHILIPP MITTERÖCKER  
(KLI):

**Statistics, Geometry, and Biological Meaning: Examples from the Study of Heterochrony and Modularity in the Human Cranium**

ALIRIO ROSALES  
(Department of Philosophy, University of British Columbia):

**Understanding Adaptation: Why Stability?**

JULIEN DELORD  
(KLI):

**Neutral Theories and the Unification of Evolutionary Biology**

SIMON HUTTEGGER  
(KLI):

**The Evolution of Simple Communication Systems**

MARK H. BICKHARD  
(Lehigh University, Bethlehem, PA, USA):

**The Brain Doesn't Work That Way: From Microgenesis to Cognitions**

THOMAS ALLEY  
(Department of Psychology, Clemson University, SC & KLI):

**Human Facial Attractiveness: Some Evolutionary and Ethological Perspectives**

JOANNA BRYSON  
(University of Bath):

**Evolving Cultural Evolution**

NATHALIE GONTIER  
(Vrije Universiteit Brussel):

**Epistemologizing Evolutionary Theories**

Publikationen  
Publications

4



*Wissenschaftliche Publikationen und Vorträge von Fellows und permanenten Mitarbeitern des KLI, sowie Artikel in „Biological Theory“, die im Jahr 2007 erschienen sind.*

## 4.1 Bücher Books and Edited Volumes

*Bücher und Sondernummern von wissenschaftlichen Zeitschriften, deren Entstehen durch das KLI gefördert wurden.* 41

CALLEBAUT W, COLLIER J (eds).

**Biological Information. Thematic Issue.**

Biological Theory 1(3).

CALLEBAUT W, RASSKIN-GUTMAN D (eds).

**Modularity. Understanding the Development and Evolution of Natural Complex Systems. Vienna Series in Theoretical Biology.**

Cambridge, MA: MIT Press.

Second printing.

LEHMANN-WAFFENSCHMIDT M.

**Komparativ-evolutorische Analyse. Konzeption und Anwendungen.**

Dresdner Beiträge zur Volkswirtschaftslehre, Fakultät Wirtschaftswissenschaften der TU Dresden.

LEHMANN-WAFFENSCHMIDT M (ed).

**Innovations towards Sustainability. Conditions and Consequences.**

Heidelberg: Physica Verlag.

## 4.2 Vienna Series in Theoretical Biology

*Die „Vienna Series“ wird von MIT-Press als Buchreihe des KLI herausgegeben.*

*Die Bücher beruhen größtenteils auf den Altenberger Workshops und den sich daraus ergebenden Beiträgen und neuen Synthesen. Die jeweiligen Buchprojekte werden von MIT-Press einem Review unterzogen.*

Neu erschienen Volume 7:



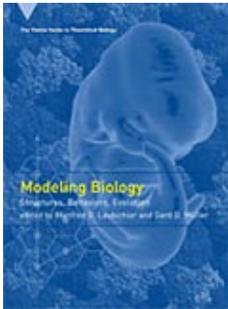
REID RGB.

**Biological Emergences. Evolution by Natural Experiment.**

Cambridge: MIT-Press.



42 Neu erschienen Volume 8:



LAUBICHLER M, MÜLLER GB (eds).  
**Modeling Biology. Structures, Behaviors, Evolution.**  
Cambridge: MIT-Press.

### 4.3 Fachartikel Professional Papers

ALLEY TR.

**Meat Eating and the Evolution of Human Behavior.**

Human Ethology Bulletin, 22(4): 15-20.

BRAUCKMANN S, THIEFFRY D.

**Graphing Genes, Cells and Embryos.**

BioEssays 29(10): 1059-1061.

BRAUCKMANN S.

**Die Differenz von Embryoformen und Zellmorphologien: Eine epistemische Betrachtung.**

In: Bildfunktionen in den Wissenschaften (Hofer V, Klemun M, eds). Wiener Zeitschrift zur Geschichte der Neuzeit 7(1): 71-83.

BRYSON J.

**Embodiment vs. Memetics.**

Mind & Society, appeared online 20 November. DOI: 10.1007/s11299-007-0044-4.

CALLEBAUT W.

**Modeling Organisms [Conference Report].**

Biological Theory 2(2): 209–210.

CALLEBAUT W.

**Herbert Simon's Silent Revolution.**

Biological Theory 2(1): 76–86.

CALLEBAUT W.

**Transcendental Niche Construction.**

Acta Biotheoretica 55: 73-90.

CALLEBAUT W, LAUBICHLER MD.

**Biocomplexity as a Challenge for Biological Theory [Editorial].**

Biological Theory 2(1): 1–2.

CALLEBAUT W, LAUBICHLER MD.

**From Cells to Systems: Conceptual Abstractions of Biological Building Blocks [Editorial].**

Biological Theory 2(2): 117–118.

CALLEBAUT W, LAUBICHLER MD.

**„General Biology“ Old and New: The Challenges Facing Biological Explanation [Editorial].**

Biological Theory 2: 329-331.

CALLEBAUT W, MÜLLER GB, NEWMAN SA.

**The Organismic Systems Approach: Evo-Devo and the streamlining of the naturalistic agenda.**

In: Integrating Evolution and Development: From Theory to Practice (Sansom R, Brandon RN, eds), 25-92. Cambridge, MA: MIT Press.

CAPORAE LR.

**Evolutionary Theory for Social and Cultural Psychology.**

In: Social psychology: Handbook of basic principles (Higgins ET, Kruglanski A, eds), 3-18. New York: Guildford Press.

COLLINS JP, GILBERT S, LAUBICHLER MD, MÜLLER GB.

**Modeling in EvoDevo: How to Integrate Development, Evolution, and Ecology.**

In: Modeling Biology (Laubichler MD, Müller GB, eds), 355-378. Cambridge MA: MIT Press.

DELORD J.

**The Nature of Extinction.**

Studies in History and Philosophy of Sciences Part C 38(3): 656-667.

HEINTZ C.

**Institutions as Mechanisms of Cultural Evolution: Prospects of the Epidemiological Approach.**

Biological Theory 2(3): 244–249.

HOFBAUER J, HUTTEGGER SM.

**Selection-Mutation Dynamics of Signaling Games With Two Signals.**

In: Proceedings of the ESSLLI 2007 Workshop on Language, Games, and Evolution, 25-32.

HUTTEGGER SM.

**Evolution and the Explanation of Meaning.**

Philosophy of Science 74: 1-27.

HUTTEGGER SM.

**Zur Evolution von Normen.**

In: Persuasion und Wissenschaft. Aktuelle Fragestellungen von Rhetorik und Argumentationstheorie (Kreuzbauer G, Gratzl N, Hiebl E, eds), 267-277. Wien: LIT-Verlag.



44 HUTTEGGER SM.

**Evolutionary Explanations of Indicatives and Imperatives.**

Erkenntnis 66: 409-436.

KHALIL E.

**The Problem of Creativity: Distinguishing Technological Action and Cognitive Action.**

Revue de Philosophie Économique 8(2): 33-69.

KHALIL E.

**Action, Entrepreneurship and Evolution.**

In: Handbook of Whiteheadian Process Thought: Thematic Entries I. (Weber M, ed), 109-123.

Frankfurt: Ontos Verlag.

KROHS U.

**Der Funktionsbegriff in der Biologie.**

In: Wissenschaftstheorie. Ein Studienbuch (Bartels A, Stöckler M, Hrsg.), 287-306. Paderborn:

Mentis.

KROHS U.

**Wo im Krankheitsbegriff steckt die Norm?**

Erwägen, Wissen, Ethik 18: 114-115.

KROHS U, CALLEBAUT W.

**Data Without Models Merging with Models Without Data.**

In: Systems Biology: Philosophical Foundations (Boogerd FC, Bruggeman FJ, Hofmeyr J-HS,

Westerhoff HV, Hrsg.), 181-213. Amsterdam: Elsevier.

LAUBICHLER M, MÜLLER GB.

**Models in Theoretical Biology.**

In: Modeling Biology (Laubichler MD, Müller GB, eds), 3-10. Cambridge MA: MIT Press.

MITTEROECKER P, BOOKSTEIN FL.

**The Conceptual and Statistical Relationship between Modularity and Morphological Integration.**

Systematic Biology 56(5): 818-836.

MÜLLER GB.

**Evo-Devo: Extending the Evolutionary Synthesis**

Nature Reviews Genetics 8: 943-949.

MÜLLER GB.

**EvoDevo as a Discipline.**

In: Evolving Pathways: Key Themes in Evolutionary Developmental Biology (Minelli A, Fusco G, eds), 5-30. Cambridge: Cambridge University Press.

MÜLLER GB.

**Six Memos for EvoDevo.**

In: From Embryology to EvoDevo: A History of Developmental Evolution. (Laubichler MD, Maienschein J, eds), 499-524. Cambridge MA: MIT Press.

RANGE F, VIRANYI ZS, HUBER L.

**Selective Imitation in Domestic Dogs.**

Current Biology 17: 868-872.

TALMONT-KAMINSKI K.

**Review of P. Thagard: Hot Thought.**

Metapsychology Online Reviews 11(27).

TALMONT-KAMINSKI K.

**Review of Wimsatt: Re-engineering Philosophy for Limited Beings.**

Metapsychology Online Reviews 11(52).

TALMONT-KAMINSKI K.

**Review of D. Linden: The Accidental Mind.**

Metapsychology Online Reviews 11(37).

TALMONT-KAMINSKI K.

**Reason, Red in Tooth and Claw: Naturalising Enlightenment Thinking.**

In: How Successful is Naturalism (Gasser G, ed), 183-199. Frankfurt: Ontos.

TESCHLER-NICOLA M, MITTEROECKER P.

**Von künstlicher Kopfformung.**

In: Attila und die Hunnen (Historisches Museum der Pfalz, Speyer, ed), 270 - 281. Stuttgart: Theiss.

#### 4.4 Artikel im Druck Papers in Press

CAPORAEI LR.

**Groups and the evolution of good stories and good choices.**

In: Rationality and Social Responsibility (Krueger JM, ed). Philadelphia: Psychology Press.

DELORD J.

**L'extinction d'espèce: histoire et enjeux philosophiques.**

Paris Publications scientifiques du Muséum National d'Histoire Naturelle, Collection „Archives“.

DELORD J.

**Vers une écologie biotech?**

In: La vie vécue, la vie expliquée (Miquel P-A, ed). Numéro spécial de la revue Noesis, Vrin, Paris.

HUTTEGGER SM.

**On Robustness in Signaling Games.**

Philosophy of Science.

HUTTEGGER SM, SKYRMS B, SMEAD R, ZOLLMAN KJS.

**Evolutionary Dynamics of Lewis Signaling Games.**

Synthese.



46 KHALIL E.  
**The Problem of Creativity: Distinguishing Technological Action and Cognitive Action.**  
Revue de Philosophie Économique.

KROHS U.  
**Co-Designing Social Systems by Designing Technical Artifacts: A Conceptual Approach.**  
In: Philosophy and Design: From Engineering to Architecture (Vermaas PE, Kroes P, Light A, Moore SA, eds), 233-245. Dordrecht: Springer.

KROHS U.  
**Welche Fragen beantwortet der „intelligent-design“-Kreationismus?**  
In: Evolutionstheorie - Schöpfungsglaube (Langthaler R, Hrsg.), 61-80. Würzburg: Königshausen & Neumann.

LEHMANN-WAFFENSCHMIDT M.  
**Gibt es eine Evolution in der Wirtschaft? Zur Diagnose und Analyse des wirtschaftlichen Wandels**  
In: Schöpfung und Evolution (Klose J, Oehler J, eds). Metropolis Verlag.

MITTEROECKER P, BOOKSTEIN FL.  
**The Evolutionary Role of Modularity and Integration in the Hominoid Cranium.**  
Evolution 62(4): 943-958.

VIRANYI ZS, RANGE F, HUBER L.  
**Attentiveness Toward Others and Social Learning in Domestic Dogs.**  
In: Learning from Animals? Examining the Nature of Human Uniqueness (Röska-Hardy LS, Neumann-Held EM, eds). London: Psychology Press.

WEBER GW, GUNZ P, NEUBAUER S, MITTEROECKER P, BOOKSTEIN FL.  
**Digital South African Fossils: Morphological studies using reference based reconstruction and electronic preparation.**  
In: Proceedings of the African Genesis Symposium.

WEBER GW, MITTEROECKER P, GUNZ P, NEUBAUER S, BOOKSTEIN FL.  
**Virtual Anthropology and Geometric Morphometrics - Paleoanthropological Applications and the Dissemination of Know-how and Data.**  
In: Advanced Imaging in Biological Anthropology and Bioarchaeology: Acquisition, Analysis and Dissemination (Hoppa R, Nelson A, eds). Cambridge: Cambridge University Press.

## 4.5 Zeitschrift „Biological Theory“ Journal

### Volume 2(2007), Issue 1:

47

CALLEBAUT W, LAUBICHLER MD.

**Editorial: Biocomplexity as a Challenge for Biological Theory.**

VELICHKOVSKY BM.

**Towards an Evolutionary Framework for Human Cognitive Neuroscience.**

SKYRMS B.

**Dynamic Networks and the Stag Hunt: Some Robustness Considerations.**

BLUTE M.

**The Evolution of Replication.**

CHEMERO A, TURVEY MT.

**Complexity, Hypersets, and the Ecological Perspective on Perception-Action.**

ARONOVA E.

**Karl Popper and Lamarckism.**

DANCHIN A.

**Archives or Palimpsests? Bacterial Genomes Unveil a Scenario for the Origin of Life.**

GARCÍA CL.

**Cognitive Modularity, Biological Modularity, and Evolvability.**

GILBERT SF.

**Discussion: Michael Ruse—Bare-Knuckle Fighting: EvoDevo versus Natural Selection.**

CALLEBAUT W.

**Trend: Herbert Simon's Silent Revolution.**

BURKHARDT RW.

**Profile: Niko Tinbergen: The Ethologist as Field Naturalist.**

RICHARDSON RC, STEPHAN A.

**Concept: Emergence.**

RICHARDS RJ.

**Historical Essay: Ernst Haeckel's Alleged Anti-Semitism and Contributions to Nazi Biology.**

ROSS D.

**Essay Review: Game Theory as Mathematics for Biology.**

RASSKIN-GUTMAN D.

**Book Review: The Power of Mathematical Modeling in Developmental Biology.**



48 MUELLER-WILLE S.  
**Book Review: Philosophy of Biology Beyond Evolution.**

AO P.  
**Letter: Darwinian Dynamics Implies Developmental Ascendency.**

### **Volume 2(2007), Issue 2:**

CALLEBAUT W, LAUBICHLER MD.  
**Editorial: From Cells to Systems: Conceptual Abstractions of Biological Building Blocks.**

MESOUDI A.  
**Biological and Cultural Evolution: Similar but Different.**

NIJHOUT F, REED MC, ULRICH CM.  
**A Day in the Life of Cell Metabolism.**

PERETÓ J, CATALÀ J.  
**The Renaissance of Synthetic Biology.**

LAUBICHLER M.  
**The Specter of the Past: What the History of Theoretical Biology Means Today.**

LOETTIGERS A.  
**Model Organisms and Mathematical and Synthetic Models to Explore Gene Regulation Mechanisms.**

NESSE RM.  
**Runaway Social Selection for Displays of Partner Value and Altruism.**

PLUTYNSKI A.  
**Drift: A Historical and Conceptual Overview.**

WEBER BH.  
**Fact, Phenomenon, and Theory in the Darwinian Research Tradition.**

COFFMAN JA, ULANOWICZ RE.  
**Discussion: Ping Ao—Darwinian Dynamics Implies Developmental Ascendency: A Matter of Competing Metaphysics.**

GORELICK R.  
**Discussion: Werner Callebaut and John Collier—Editorial: Biological Information: When Information Theory Is No Longer Theory.**

RUSE M.  
**Discussion: Scott F. Gilbert—Second to the Right, Straight on till Morning: Does EvoDevo Break the Paradigm?**

BRUGGEMAN FJ.

**Trend: Systems Biology: At Last an Integrative Wet and Dry Biology!**

SEGERSTRALE U.

**Profile: Between Kafka and Bates: The Scientific Cycling of Bill Hamilton.**

NÚÑEZ JA, DE MARCO RJ.

**Historical Essay: Technology and the Foundations of Biology.**

NIKLAS KJ.

**Book Review: All Creatures, Great and Small. The Geometry of Evolution: Adaptive Landscapes and Theoretical Morphospaces.**

BARAHONA A.

**Book Review: New Wine in Old Bottles. Evolution: From Molecules to Ecosystems.**

DELORD J.

**Book Review: Evolutionary Perspectives on Environmental Problems.**

ROSALES A.

**Book Review: The Philosophy of Evolutionary Biology in Theory and Practice. Making Sense of Evolution: The Conceptual Foundations of Evolutionary Biology.**

PAGE RE, JR.

**Book Review: Confessions of an Evolutionary Biologist. Developmental Plasticity and Evolution.**

CALLEBAUT W.

**Conference Report: Modeling Organisms.**

LAUBICHLER MD.

**Conference Report: Where is Theoretical Biology Heading?**

### **Volume 2(2007), Issue 3:**

STERELNY K.

**Guest Editorial: Rethinking Inheritance.**

GINSBURG S, JABLONKA E.

**The Transition to Experiencing: I. Limited Learning and Limited Experiencing.**

GINSBURG S, JABLONKA E.

**The Transition to Experiencing: II. The Evolution of Associative Learning Based on Feelings.**

HEINTZ C.

**Institutions as Mechanisms of Cultural Evolution: Prospects of the Epidemiological Approach.**



50 KERR B.  
**Niche Construction and Cognitive Evolution.**

MESOUDI A.  
**A Darwinian Theory of Cultural Evolution Can Promote an Evolutionary Synthesis for the Social Sciences.**

ODLING-SMEE J.  
**Niche Inheritance: A Possible Basis for Classifying Multiple Inheritance Systems in Evolution.**

OKASHA S.  
**Cultural Inheritance and Fisher's „Fundamental Theorem“ of Natural Selection.**

REISMAN K.  
**Is Culture Inherited through Social Learning?**

LIVINGSTONE SMITH D.  
**Interrogating the Westermarck Hypothesis: Limitations, Problems, and Alternatives.**

STERELNY K.  
**SNAFUS: An Evolutionary Perspective.**

## 4.6 Doktorarbeiten Supported Theses

HEINTZ C.  
**Scientific Cognition and Cultural Evolution: Theoretical Tools for Integrating Cognitive and Social Studies of Science.**  
PhD Thesis. Ecole des Hautes Etudes en Sciences Sociales, Paris.

MITTERÖCKER P.  
**Evolutionary and Developmental Morphometrics of the Hominoid Cranium.**  
PhD Thesis. University of Vienna.

## 4.7 Publizierte Abstracts Published Abstracts

PELLEGRINI A, TESCHLER-NICOLA M, MITTEROECKER P, BOOKSTEIN FL.  
**Geometric Morphometric Craniofacial Analysis of early Bronze Age Austrian Populations.**  
Am. J. Phys. Anthropol. Suppl. 46.

MITTEROECKER P, MANFREDA E, BOOKSTEIN FL, SCHAEFER K.  
**Does the Morphology of the Human Atlas and Axis Reflect Bipedality? A Multivariate Approach to Functional Morphology.**  
Am. J. Phys. Anthropol. Suppl. 44.

GUNZ P, HARVATI K, MITTEROECKER P, BOOKSTEIN FL, WEBER GW, HUBLIN JJ.  
**Was Sexual Dimorphism in Early Homo erectus s.l. as Large as in Gorilla? A Reassessment of the ER-1813 Cranium in the Light of Hominoid Allometries.**  
 Am. J. Phys. Anthropol. Suppl. 44.

SCHAEFER K, MITTEROECKER P, GUNZ P, BERHARD M, BOOKSTEIN FL.  
**„Maleness“ Reconsidered: Hominoid Craniofacial Sexual Dimorphism.**  
 Am. J. Phys. Anthropol. Suppl. 44.

#### 4.8 Vorträge und Kongressbeiträge Scientific Presentations

ALLEY TR.  
**Human Facial Attractiveness: Some Evolutionary and Ethological Perspectives.**  
 KLI Brown Bag Discussion, Altenberg, Austria.

ALLEY TR.  
**Eyewitness Testimony: A Review of Factors that Impair or Improve Reliability.**  
 Université Catholique de Louvain, Louvain-la-Nueve, Belgium.

BICKHARD MH.  
**The Brain Doesn't Work That Way: From Microgenesis to Cognitions.**  
 KLI Brown Bag Discussion, Altenberg, Austria.

BRYSON J.  
**AI Architectures (or State Requirements for Human-like Action Selection)**  
 The European Network for the Advancement of Artificial Cognitive Systems (euCognition)  
 Network Meeting on Cognitive Architectures, Munnich, Germany.

BRYSON J.  
**Cognition (& Robots).**  
 Research symposium: Humans and Humanoids - Perspectives in Cognition and Robotics,  
 Bielefeld University.

BRYSON J.  
**Robots Should Be Slaves.**  
 Workshop on Artificial Cognitive Companions, Oxford.

BRYSON J.  
**A Primer on AI for Domestic Robots: Does Thinking Help?**  
 Seminar at the Centre for Non-linear Mechanics, Bath.

BRYSON J.  
**Information can be Free: Implications for Recent Developments in the Evolution of Altruism.**  
 Göttinger Freilandtage, Göttingen, Germany.



52 BRYSON J.

**Hierarchical Organization of Intelligence: Ethology and AI Perspectives.**

NIPS Workshop on Hierarchical Organization of Behavior: Computational, Psychological and Neural Perspectives, Vancouver.

BUTLER S, BRYSON J.

**Effects of Mass Media and Opinion Exchange on Extremist Group Formation.**

European Social Simulation Association annual meeting, Toulouse.

CALLEBAUT W.

**Organism, Environment, and Bounded Rationality.**

Discussion Meeting, „Phenotypic and Developmental Plasticity,” Estuary Island, Thiruvananthapuram, Kerala, India.

CALLEBAUT W.

**Contingency and Inherency in (Eco)EvoDevo.**

EPSA 07: 1st Conference of the European Philosophy of Science Association, Madrid, Spain.

CALLEBAUT W.

**Epistemologia Naturalizada: Avances Recientes en la Naturalización.**

XIV Congreso Internacional de Filosofía, „Identidad y Diferencia”, Mazatlán, Sinaloa, Mexico.

CALLEBAUT W.

**Discussant (with Gertrudis Van de Vijver, Lenny Moss, Jonathan Kaplan, and Andrew Hamilton), Octavian Session, „Philosophies of Biology: Naturalistic, Transcendental or Beyond?”**

ISHPSSB Meeting, University of Exeter, UK.

CALLEBAUT W.

**From Systems Biology to Evo-Devo and Back.**

ISHPSSB Meeting, University of Exeter, UK.

CALLEBAUT W.

**Contingency and Inherency in EvoDevo.**

6th Annual Conference in Philosophy & Biology, Center for Philosophy of Biology, Duke University, Durham, NC.

CALLEBAUT W, MÜLLER G.

**Innovation From EvoDevo to Human Culture.**

17th Altenberg Workshop in Theoretical Biology, „Innovation in Cultural Systems,” Konrad Lorenz Institute for Evolution and Cognition Research, Altenberg, Austria.

DELORD J.

**Neutral Theories and the Unification of Evolutionary Biology.**

KLI Brown Bag Discussion, Altenberg, Austria.

DELORD, J.

**What's so Special about Neutral Theories in Ecology?**

Division of Logic, Methodology and Philosophy of Science (DLMPS), Beijing, China.

DELORD, J.

**Neutral Theories and the Unification of Evolutionary Biology.**

ISHPSSB Meeting, University of Exeter, UK.

DELORD, J.

**Écologie et hiérarchie enchevêtrée .**

Colloque „La question des enchevêtrements hiérarchiques en mathématiques et en biologie „, Université de Nice, France.

DELORD, J.

**Les extinctions d'espèces ou les méandres de l'histoire écologique.**

Colloque „Ecologie: Science, Art et Société“, Sorbonne, Paris, France.

DELORD, J.

**Vers une unification des stratégies neutralistes en biologie évolutive ?**

Conference of the french „Société de philosophie des sciences (SPS)“, University of Geneva, France.

HEINTZ C.

**Distribuer la cognition mathématique.**

Séminaire générale de philosophie des sciences de l'IHPST, Paris.

HEINTZ C.

**Search Engines and Distributed Assessment Systems.**

Kazimierz Naturalized Epistemology Workshop (KNEW07).

HEINTZ C.

**Distributed Cognition and Cultural Epidemiology.**

Summer school „Culture and Cognition“ of the CEU, Budapest.

HEINTZ C.

**How to Update Campbell's Evolutionary Epistemology.**

International Symposium Past Minds: Evolution, Cognition, and History. Queen's University Belfast Institute of Cognition and Culture.

HERNANDEZ-CHAVEZ, P.

**Reductionism in Some Naturalized Epistemologies: The Case of Localism in Neuroscience.**

KLI Brown Bag Discussion, Altenberg, Austria.

HERNANDEZ-CHAVEZ, P.

**Reductionism in Some Naturalized Epistemologies: The Case of Localism in Neuroscience.**

ISHPSSB Meeting, University of Exeter, UK.

HERNANDEZ-CHAVEZ, P.

**Naturalising Neuroscience?**

Kazimierz Naturalised Epistemology Workshop, Kazimierz, Poland.



54 HUTTEGGER SM.

**Selection-Mutation Dynamics of Signaling Games.**

Games and Decisions in Pragmatics, Zentrum für allgemeine Sprachwissenschaft, Berlin.

HUTTEGGER SM.

**Selection-Mutation Dynamics of Signaling Games.**

Arbeitsgemeinschaft Biomathematik, University of Vienna, Austria.

HUTTEGGER SM.

**Selection-Mutation Dynamics of Signaling Games.**

ESSLI summer school, invited speaker at the workshop on Language, Games, and Evolution, Trinity College, Dublin.

HUTTEGGER SM.

**The Evolution of Simple Communication Systems.**

ISHPSSB Meeting, University of Exeter, UK.

HUTTEGGER SM.

**The Evolution of Simple Communication Systems.**

KLI Brown Bag Discussion, Altenberg, Austria.

HUTTEGGER SM.

**Learning to Transfer Information.**

Department of Philosophy, University of Salzburg, Austria.

HUTTEGGER SM.

**Evolutionary Dynamics of Signaling Games.**

Symposium in honor of Werner Leifellner, KLI for Evolution and Cognition Research, Altenberg, Austria.

HUTTEGGER SM.

**Learning to Transfer Information.**

Department of Economics, University of Innsbruck, Austria.

JÜTTE A.

**Kommunikation durch die Nase.**

Brain Awareness Week der Universität Wien, 13 March 2007.

JÜTTE A.

**A Story about Story Telling.**

ISHPSSB Meeting, University of Exeter, UK.

JÜTTE A.

**Kommunikation durch die Nase.**

Handelsakademie Wien, Austria.

KHALIL E.

**The Mirror Neuron Paradox: How Far is Sympathy from Compassion, Indulgence, and Adulation?**

NeuroPsychoEconomics Conference, Austrian Academy of Sciences, Vienna, Austria.

KHALIL E.

**Why Natural Selection Cannot Explain Rationality.**

European Association for Evolutionary Political Economy, Porto, Portugal.

KHALIL E.

**The Mirror Neuron Paradox: How Far is Sympathy from Compassion, Indulgence, and Adulation?**

Max Planck Institute of Economics, Jena, Germany.

LEHMANN H, BRYSON J.

**The Socio-Ecological Model of Female Social Relationships in the Genus Macaca: An Agent Based Approach**

European Federation for Primatology biannual meeting, Prague.

LEHMANN-WAFFENSCHMIDT M.

**Forschungskolloquium.**

Universität Bremen, Germany.

LEHMANN-WAFFENSCHMIDT M.

**Forschungskolloquium.**

Universität Bielefeld, Germany.

LEHMANN-WAFFENSCHMIDT M.

Jahrestreffen des Ausschusses für Evolutorische Ökonomik, Münster, Germany.

LEHMANN-WAFFENSCHMIDT M.

3rd International Heinz von Foerster Conference, Universität Wien, Austria.

MITTERÖCKER P.

**Modularity in the Development and Evolution of the Human Cranium.**

Think tank meeting on brain evolution and psychosis, Elounda, Greece.

MITTERÖCKER P.

**Statistics, Geometry, and Biological Meaning: Examples from the Study of Heterochrony and Modularity in the Human Cranium.**

KLI Brown Bag Discussion, Altenberg, Austria.

MITTERÖCKER P.

**Does the Morphology of the Human Atlas and Axis Reflect Bipedality? A Multivariate Approach to Functional Morphology.**

Annual Meeting of the American Association of Physical Anthropologists, Philadelphia.

MÜLLER GB.

**The EvoDevo Revolution and its Effects on Neo-Darwinism.**

Philosophy of Biology seminar of the IHPST, Université Paris 1, Sorbonne, France.



56 MÜLLER GB.

**Graphing Genes, Cells, and Embryos.**

Introduction to the Workshop „Graphing Genes, Cells, and Embryos“, Stazione Zoologica Anton Dohrn, Naples, Italy.

MÜLLER GB.

**Where EvoDevo goes beyond the Modern Synthesis.**

Symposium „What happened after the Modern Synthesis“, ISHPSSB International Meeting, Exeter, Great Britain.

MÜLLER GB.

**Internalism and the origins of organic form.**

Origins of form in life, mind, and art. Symposium on the occasion of the 175th anniversary of the University of Durham, Great Britain.

MÜLLER GB.

**The Role of Plasticity in Morphological Innovation.**

Workshop „Phenotypic and Developmental Plasticity“, Trivandrum, India.

ROSALES A.

**Understanding Adaptation: Why Stability?**

KLI Brownbag Discussion, Altenberg, Austria.

STEFANI D, VIRANYI ZS, RANGE F, HUBER L.

**Do Common Marmosets (*Callithrix jacchus*) Copy a Conspecific's Actions or their Results?**

XVIII International Ethological Conference, Halifax, Nova Scotia, Canada.

TALMONT-KAMINSKI K.

**In a Mirror, Darkly: Does Superstition Reflect Rationality?**

Goldsmith's College, London, UK.

TALMONT-KAMINSKI K.

**In a Mirror, Darkly: Does Superstition Reflect Rationality?**

Science and Rationality Workshop, Granada, Spain.

TALMONT-KAMINSKI K.

**What is this Thing Called Superstition?**

KLI Brown Bag Discussion, Altenberg, Austria.

TALMONT-KAMINSKI K.

**In a Mirror, Darkly: Does Superstition Reflect Rationality?**

Philosophers' Rally, Warsaw, Poland.

VECCHI D.

**Two Challenges for Evolutionary Epistemologies Based on Selection Theory.**

KLI Brown Bag Discussion, Altenberg, Austria.

VECCHI D.

**One Foundational Problem for Evolutionary Epistemologies based on Selection Theory: The Lamarckian Challenge.**

ISHPSSB Meeting, University of Exeter, UK.

VECCHI D.

**On the Possibility of Distinguishing the Concept of Drift from the Concept of Selection.**

13th International Congress of Logic, Methodology and Philosophy of Science, Beijing, China.

VECCHI D.

**Popper and the Thesis of the Universality of Darwinism.**

Rethinking Popper Conference, Prague, Czech Republic.

VIRANYI ZS.

**Imitation in Animals in Lack of Causal Understanding.**

AISB'07 Artificial and Ambient Intelligence, Symposium „Imitation in Animals and Artifacts“, Newcastle University, Newcastle upon Tyne, UK.

VIRANYI ZS.

**Comparative Studies in Cognition Research: What can We Learn from Dogs?**

Biology Seminars, Bolyai College, Budapest, Hungary.

VIRANYI ZS.

**A Case Study of Species Comparisons and Evolutionary Story Telling: Dog Domestication and Attachment and Communication with humans.**

Summer Ethological School, Faculty of Humanities, Charles University, Prague, Czech Republic.

VIRANYI ZS.

**Cognitive Mechanisms Explored through Behaviour: The Warning Role of Comparative Studies.**

Summer Ethological School, Faculty of Humanities, Charles University, Prague, Czech Republic.

VIRANYI ZS.

**Inferential Components of Imitation in Marmosets and Dogs: What to Learn when Observing Others?**

Department Seminar, Department for Neurobiology and Cognition Research, University of Vienna, Vienna, Austria.

VIRANYI ZS, KUBINYI E, GACSI M, MIKLOSI A.

**Hand-Reared Wolves' Relationship with their Human Raisers: Preference without Dependency.**

XVIII International Ethological Conference, Halifax, Nova Scotia, Canada.

VIRANYI ZS, TOPAL J.

**Dogs Receiving Information from Humans: Interspecific Pedagogy?**

EG-Meeting: Social Organization and Cognitive Tools. General Patterns in Vertebrates? Konrad Lorenz Forschungsstelle, Grünau, Austria.

Weitere Aktivitäten  
Further Activities

5



*Viele der Aktivitäten des KLI gehen über den wissenschaftlichen Kernbereich hinaus. Von diesen sind einige hier stellvertretend genannt und zusätzliche Förderungen werden danken angeführt.*

## 5.1 Konrad Lorenz Archiv Konrad Lorenz Archive

*Das Konrad Lorenz Archiv umfasst Lorenz' Korrespondenz aus den Jahren 1964-1989 (mit Niko Tinbergen, Karl von Frisch, Jane Goodall, Otto Koehler, Karl Popper, Paul Weiss u.a.), Tagebücher, die umfassende private Photosammlung, Manuskripte zu den meisten seiner Bücher (wie das berühmte „Russische Manuskript“), seine Sonderdruck-Sammlung und die Auszeichnungen und Preise (wie den Nobel-Preis), die Lorenz im Lauf seines Lebens verliehen wurden.*

### MAG. TARQUIN MITTERMAYR

*Tarquin Mittermayr studied history at the University of Vienna and Archive Studies at the Institute for Austrian Historical Research. In 2000 he obtained a Diploma in Bookbinding at the University of Sussex. Subsequently he worked as a librarian at the University of Surrey Roehampton and at St. George's Hospital Medical School (University of London). In 2003 he graduated with a BA Hons in European Studies from the Open University (Milton Keynes).*



### MAG. GUDRUN BRAUN

*Gudrun Braun studied biology with a focus on behavioral sciences at the University of Vienna. She received her MA in 1997.*



2007 wurde die Katalogisierung und fachgerechte Archivierung der Briefkorrespondenz fortgesetzt. Dokumente können nunmehr entweder in der Datei nach Namen oder Datum gesucht werden, oder im Archiv nach Briefpartnern und chronologisch sortiert ausgehoben werden. Nach und nach zeigt sich erst, wie umfangreich bestimmte Korrespondenzen sind. Der Briefwechsel mit Niko Tinbergen, zum Beispiel, erscheint umfangreich und interessant genug, um ihn eventuell kommentiert herauszugeben.

Weiters wurde die Sammlung Konrad Lorenz' eigener Schriften erweitert und katalogisiert, sodass das KLI nun eine umfassende Sonderdruck-Sammlung besitzt (ca. 170 Artikel), die 2008, nach der Digitalisierung, auch online der Öffentlichkeit zugänglich gemacht werden sollen.

Schließlich wurden weitere persönlichen Dokumente (v.a. Zeugnisse etc.) von Konrad Lorenz katalogisiert und in den Bestand des Archivs aufgenommen.

Für 2008 ist die Digitalisierung und Mikroverfilmung des Russischen Manuskripts, der Photosammlung und der Sonderdruck-sammlung in Arbeit.



## 60 5.2 Visions of the KLI

Durch den Designer der KLI-CI, Wolfgang Bledl, und mit Hilfe der Photographen Bill Lorenz und Matthias Silveri wurde 2007 der Bildband „Visions of the KLI“ fertiggestellt.

Neben photographischen Eindrücken rund um das Konrad Lorenz Institut und den Momentaufnahmen verschiedener Aktivitäten enthält der Band auch Kommentare über das KLI von ehemaligen Fellows und Gästen.

Das Buch soll für Geschenk- und Werbezwecke dienen.

## 5.3 Zusätzliche Förderungen Additional Funding

### Für zusätzliche finanzielle Unterstützung dankt das KLI

dem Bundesministerium für Bildung, Wissenschaft und Kultur für die Förderung der „Altenberg Workshops“ und

dem Land Niederösterreich für den Beitrag zur Erhaltung des Konrad Lorenz Vivariums und der Lorenz-Villa.

## Bildnachweis

ALBERTUS SEBA

**Das Naturalienkabinett. Vollständige Ausgabe der kolorierten Tafeln 1734-1765.**

Köln: Taschen Verlag. 2005

Umschlag: p. 319. Tomus 3: Diatema setosum

Kapitel 1: p. 310. Tomus 3: Asterina gibbosa

Kapitel 2: p. 166. Tomus 1: Squamata

Kapitel 3: p. 65. Tomus 1: Palmae

Kapitel 4: p. 167. Tomus 1: Squamata

Kapitel 5: p. 435. Tomus 3: Madrepora oculata

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