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Jahresrückblick und Struktur des KLI
Review 2009 and Structure of the KLI



*The gracious surroundings,
the conversations under the trees,
the formal sessions in the library,
the diversity of participants
all together make an unforgettable
combination.*

*Sara Shettleworth,
University of Toronto*

1.1 Jahresrückblick 2009 The Year in Review

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Im Laufe der Jahre vermehrten und diversifizierten sich die Aktivitäten des KLI. Zusätzlich zu den traditionellen Vorträgen wurde eine Workshopreihe etabliert, eine Buchreihe entstand, eine Zeitschrift begründet, eine Internetdatenbank eingerichtet, neue Schwerpunkte bei den Fellowships gesetzt und Vieles mehr. Neben der Fortführung dieser Aktivitäten und der Fertigstellung des Konrad Lorenz Bild-Archivs, sowie einer Erneuerung des Theory Lab, lag in 2009 ein erhöhtes Augenmerk auf der Einbindung des KLI in internationale Partnerschaften, besonders auch durch die Mitwirkung an Summerschools im europäischen Raum. Hervorzuheben sind hier die gemeinsame Organisation der Summerschool *European Advanced Seminars in the Philosophy of the Life Sciences*, die Beteiligung am *European Network of Interdisciplinary Centers of Excellence* (EUNICE) und die gemeinsame Durchführung der *European Summerschool in Evolutionary Developmental Biology* mit dem Istituto Veneto di Science, Lettere ed Arti, Venedig. Diese Linie der Einbindung des KLI in die akademische Ausbildung wird auch durch die Mitwirkung als Partnerinstitution am geförderten Doktoratsprogramm *The Sciences in Historical Context* an der Universität Wien unterstrichen. Weiters ist das KLI Mitglied im ESF Research Networking Programme *The Evolution of Social Cognition* und offizielle Affiliation seiner Koordinatorin, Zsófia Virányi.

Ein kurzer Überblick zeigt, dass auch 2009 wieder eine wissenschaftlich ertragreiches Jahr war: Seit der letzten Generalversammlung haben insgesamt 13 Fellows ihre Projekte am KLI durchgeführt, 41 wissenschaftliche Artikel wurden in internationalen Fachzeitschriften oder Buchbänden publiziert und 77 Vorträge wurden bei Tagungen und an wissenschaftlichen Institutionen im In- und Ausland gehalten. Im Rahmen von 2 Altenberg Workshops in Theoretical Biology wurden insgesamt 31 Beiträge präsentiert, und 19 Brown Bag Vorträge fanden am KLI statt. In der Buchreihe *Vienna Series in Theoretical Biology* erschienen 3 neue Bände und 2 ältere wurden als Paperbacks neu aufgelegt. Von der Zeitschrift *Biological Theory* erschienen 4 neue Ausgaben. Weiters beteiligte sich das KLI an verschiedenen Veranstaltungen außer Haus, wie z.B. an der Darwin-Jahr Veranstaltung „Evo-Evo“ im Künstlerhaus in Wien.

Die Details zu den genannten und weiteren Aktivitäten finden Sie auf den nachfolgenden Seiten. Wie immer danke ich an dieser Stelle allen, die dies bewerkstelligt und ermöglicht haben sehr herzlich für ihren Einsatz. Mein besonderer Dank gilt den Förderern, dem Vorstand und dem Mitarbeiterstab des KLI.

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, Photographien, 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

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School of Audiology and Speech-Language Pathology, University of
Memphis, TN, USA

Wissenschaftliche Projekte Scientific Projects

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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 2009 64 Anfragen für Stipendien und Fellowships, wovon 14 vom Vorstand behandelt, und 11 für das laufende oder kommende Jahr genehmigt wurden.

	Anträge	genehmigt
Thesis-Stipendien und Junior-Stipendien	1	1
Postdoktoranden- / Przi Bram-Stipendien	8	5
Gastwissenschaftler-Stipendien	5	5

2.2 Dissertations-Stipendien Thesis Fellowships

Miles MACLEOD

(November 2009 - October 2010)

*Miles MacLeod is currently completing his PhD dissertation on the historical epistemic roles of theoretical entity concepts at the University of Vienna with the **Initiativkolleg, Naturwissenschaften im historischen Kontext.***



The Epistemic-Only View of Natural Kinds

Elne rein erkenntnistheoretische Betrachtung natürlicher Arten

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

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

I believe, however, this conclusion is premature, as it fails

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

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



Jan VERPOOTEN

(November 2009 - December 2010)

Jan Verpooten obtained his MSc Biology (option, "Organisms and Populations") from the University of Antwerp, Belgium. He studied the social behavior (conflict management) of spider monkeys in the wild in Yucatán, Mexico, as a research assistant of Prof. dr. Filippo Aureli, John Moore's University, UK. For some years now he has been collaborating with Prof. Dr. Mark Nelissen of the University of Antwerp (Behavioral Biology) in developing an evolutionary approach to human artistic behaviors. At the moment he is preparing a PhD on this subject.

Sensory Exploitation and Artistic Behavior

Wahrnehmungspräferenzen und Kunst

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

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

10 2.3 Postdoktoranden-Stipendien Postdoctoral Fellowships



Dr. Christophe HEINTZ
(July 2007 - September 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 (Sperber's epidemiology of representation, Hutchins' distributed cognition) and situated cognition.

The project consists in 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 - February 2009)

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.



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Modularity and Morphological Integration in the Hominoid Cranium

Modularität und morphologische Integration des hominoiden Schädels

There is 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.



Dr. Alejandro ROSAS LOPEZ

(July 2008 - June 2010)

Alejandro Rosas is associate professor in the philosophy department at the Universidad Nacional de Colombia. Trained initially as a Kant scholar, he later turned to pursue a naturalistic worldview. His current project is to develop a picture of the evolutionary genesis of a moral agent. This involves work on moral psychology and moral theory, experimental economics, multilevel selection theory, the evolutionary theory of cooperation, and the evolution and phylogeny of typical human cognitive and

behavioral traits. Recent publications include “The socio-biological dilemma” (Zygon 2007), “Multilevel selection and human altruism” (Biology and Philosophy 2008) and “The return of reciprocity” (Biology and Philosophy 2008). Prof. Rosas is currently a Senior Fellow at the KLI.

The Genesis of a Moral Agent

Die Entstehung eines moralischen Akteurs

I propose a multidisciplinary project on the evolution of moral behavior, connecting the evolutionary theory of altruism and cooperation to several behavioral sciences. The research subject is approached by focusing on the evolution of an agent with the psychological profile of a contractarian moral agent – in the Kantian rather than Hobbesian tradition –, which implies that fairness and a respect for persons as equals are intrinsically valued, without denying that humans also exhibit a natural tendency to betray these values. The evolutionary explanation faces two challenges, both addressed by the project: the paradox of biological altruism, i.e., the fact that altruistic traits seemingly contradict the theory of natural selection, as first noted by Darwin (1871); and the need to theorize over a plausible phylogenetic origin of moral agents. Building upon recent proposals that link human cooperation to motivations to comply with norms of fairness and to punish norm-violations, the project proceeds along the following hypotheses:

1. In the evolution of morality, individual and group selection are not opposed, but synergistic forces. The psychology of norm endorsement is designed to support social practices and institutions that suppress the advantages of selfish, freeloader behavior. Under these conditions, moral behavior benefits both the individual and the group.
2. All human cooperative strategies, strong reciprocity, indirect reciprocity, and reciprocal altruism are norm-guided, and guided in fact by the same general norm of conditional or reciprocal cooperation.
3. Concerning the phylogenesis of moral agents, the selection pressures responsible for the evolution of the appropriate moral psychological architecture began only to operate after

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humans had developed the ability to perceive the opportunities for cooperation with delayed reciprocity in interactions with a prisoner's dilemma structure.

4. The suitable interaction type for promoting the evolution of fairness norms was not contest for dominance between males, but interaction between males and females for the rearing of offspring. This interaction has the structure of a prisoner's dilemma. It requires the fulfillment of expectations for mutual constraints on behavior and favors the evolution of fairness. Once the psychological profile for human long-term mating strategies evolved, involving male parental investment and trust between sexual partners, the profile influenced other social interactions.



Dr. Matthias SAMWALD

(January 2009 - Dezember 2010)

Matthias Samwald is a postdoctoral researcher at the KLI and DERI Galway (Galway, Ireland), and is a member of the World Wide Web Consortium (W3C). He studied experimental neurobiology at the University of Vienna and at the Medical University of Vienna. His doctoral thesis was focused on employing Semantic Web technologies in neuroscience and biomedicine. He worked for the Yale Center for Medical Informatics (US), the Yale Department of Neurobiology (US), Science Commons (US), and the Semantic Web Company (Austria). The major aim of his work is the transdisciplinary synthesis of biology, medicine, informatics, and philosophy, as well as bridging the gap between fundamental academic research and practical industrial applications.

An Integrated Knowledge Base of Vertebrate Cognition

Eine integrierte Wissenbasis zur Kognition bei Wirbeltieren

Modern neurocognitive research produces vast amounts of data and hypotheses. A thorough understanding of the

brain and cognitive processes requires the integration of data from many different types of organisms, experiments, research groups, disciplines, publications, and databases into a coherent view of biological reality.

This project will harness new, powerful information technologies (Semantic Web technologies, ontologies) to provide such an integrated view. The project will consist of the following work packages:

- 1) Creating a machine-processable ontology for the representation of vertebrate cognition and behavior based on a thorough analysis of relevant literature.
- 2) Interlinking the ontology of vertebrate cognition with a wide variety of existing ontologies, data repositories, and publications, thereby creating a large knowledge base about cognition and neurobiology.
- 3) Creating an interactive knowledge base on the KLI website, based on the resources developed in tasks 1 and 2. This knowledge base will build on the established KLI Theory Lab, forming one of the first sophisticated online databases about cognition and biological theory. The knowledge base will be hosted on the KLI website and will, after further extension into other knowledge domains, replace the existing version of the KLI Theory Lab.
- 4) Evaluating the practical value of the knowledge base by answering biomedical questions. The knowledge base will be used to elucidate relevant biomedical problems, such as the cognitive aspects of neurodegenerative diseases.
- 5) Disseminating project outcomes, international networking and ensuring long-term sustainability. The extended version of the KLI Theory Lab will be actively disseminated to expert communities, media, and the wider public. Successful dissemination will ensure the participation of others in the further extension and refinement of the knowledge base after this project has ended.



Dr. István SCHEURING

(September 2009 - April 2010)

István Scheuring is a senior research fellow at Loránd Eötvös University, Budapest and at the Hungarian Academy of Sciences. He studied physics and biology at Loránd Eötvös University (PhD in theoretical biology, 1994). His interests cover many different areas of theoretical biology, including ecology, the origins of life, and the evolution of cooperation and mutualism.

Dr. Scheuring has been a visiting fellow at the Collegium Budapest in 1995 and at the Max Planck Institute of Complex Systems in Dresden, Germany 2006.

Social Noise and the Evolution of Human Cooperation **Der Effekt von sozialem „Rauschen“ in der Evolution menschlicher Kooperation**

Altruism and cooperation, which impregnate human behavior, are usually explained by either kin or group selection mechanisms or by direct and indirect reciprocity. Direct reciprocity can be explained by the existence of some memory device capable of storing previous actions or by limited dispersal. However, the evolutionary origin and stability of indirect reciprocity can be explained only when the actions are observed and classified by the members of society with the help of a social norm. Knowing the actual score (reputation) of a potential recipient (and of the donor) and the norm followed by the potential donor, she can decide whether its recipient is worth of donation or not. If freeriders are excluded effectively from the interaction by this norm, indirect reciprocity can be maintained.

My project presents two problems connected with the evolution of cooperative social norms and the effectiveness of altruistic punishment based on strong reciprocity. Indirect reciprocity and systems of norms in general are based on information about the social status of the potential partner in the population. Most models assume that individuals are well informed about the reputation of their partners due to direct perception or reliable information transfer among individuals. Although different algorithms are applied for the information

transfer in the theoretical papers, they have a common nature, viz., they assume that communication is honest, and, hence, the information is reliable. Similarly, there is no incentive to cheat in the experimental settings. However, this is not sufficiently the case in the real world: in addition to information transfer, communication also enables manipulation, mainly by the social denigration of others.

I am interested in the question whether reliable information transfer can co-evolve with a cooperative system of norms in a population structure characteristic of ancient humans. I use the general framework of the indirect reciprocity game, and I assume that individuals follow second-order norms and that cooperative or defective actions are classified as “good” or “bad” according to their norm. In this new model, the behavior of the potential receiver is estimated by the information from the observers of the previous action of the receiver.

The questions are: Is it possible that cultural selection maintains honest communication? If honest communication is possible, what are the main factors responsible for it? Are there polymorphisms in gossip rules in the evolutionary equilibrium?

In the second part of the project I study how social and environmental circumstances impinge on the success of egalitarian and strong reciprocity strategies. It is generally accepted that humans follow “strong reciprocity” in social dilemmas, i.e., that they obey cooperative norms and (altruistically) punish its violators. The role of strong reciprocity in maintaining cooperation among unrelated human individuals is questioned by some recent experiments, which highlight that there is an alternative explanation for the punishment of norm violators.

Social norms can be effective only if participants analyze situations correctly. Moreover, social norms maintain cooperation among unrelated individuals only if the information transfer among individuals is widespread and reliable. Thus we have the following hypotheses: If “social noise” is high in the population, it is much easier to evaluate individuals according to their income rather than their behavior, i.e., the egalitarian strategy is more effective than cooperative norms.

To study this hypothesis, I work out a model that follows up on Fehr and Gächter’s (2002) experimental set-up.

The following questions are studied:

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Are there circumstances in which strong reciprocity is the winner of the selection, while in other cases the egalitarian motive is the better strategy?

Does social noise alone determine the outcome of the selection, or are the costs and benefits of the games important as well?



Dr. Christine SCHWAB

(December 2009 - November 2010)

Christine Schwab studied cultural anthropology and sociology at the University of Vienna and received her master's degree, supervised by Prof. Andre Gingrich, working on the identity process of the Hungarian ethnic minority in Austria (for which she was awarded an academic prize). She then studied zoology at the University of Vienna, completing her MSc under the supervision of Prof. Ludwig Huber, investigating the ability of dogs to differentiate degrees of attention of their owners. She held a PhD position in an FWF project granted to Prof. Kurt Kotrschal for studying the influence of social relations on social learning in corvids, and was responsible for establishing jackdaws as a new research species at the KLF (Konrad Lorenz Research Station) in Grünau, Upper Austria. In Spring 2009 she collaborated with Prof. Ronald Noë at the CNRS in Strasbourg, France, on biological markets. She was awarded the Laudimaxima Prize from the University of Vienna for promoting women in the natural sciences and mathematics.

Social Networks in Corvids

Soziale Netzwerke bei Krähenvögeln

My interest concentrates on the evolution of social behavior by investigating structural and functional aspects of jackdaw, *Corvus monedula*, and raven, *Corvus corax*, social systems. I will employ a theoretical approach and methods that originated in mathematical graph theory and are new and innovative in animal behavior research: social network theory

and social network analysis (SNA). The project comprises two objectives: first, to generate and analyze networks in these two species and to investigate their comparability and changes over time; second, to experimentally address the question which social networks influence transmission of information and access to resources within the group. Data on social interactions already exist. They consist of two years of observations on one captive colony each, one year on a wild jackdaw colony; data on wild ravens are currently collected.

SNA has several important advantages:

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

Objective 1: Analysis of social interactions is expected to result in 4 networks (sociopositive, spatial association, agonistic, defensive) that differ distinctively with regard to several SNA measures. Each of these networks will be analyzed in three time periods, reflecting different periods in the birds' annual cycle. Comparisons of networks between periods, contexts (in the wild and in captivity), and species will show how networks change over time, and will provide better insight into the social structure of jackdaw and raven colonies.

Objective 2: Investigating the functional value individuals can draw from their social networks in two different contexts. First, two antithetic hypotheses will be tested regarding propagation of information within a group. Hypothesis A is commonly found in the literature: spatial proximity/affiliation between individuals enhances social learning and, therefore, information transmission within groups should follow affiliation patterns between group members. Hypothesis B stems from human sociology: weak ties are important for information transmission (tie = sociopositive and symmetric). Therefore, information transmission should follow agonistic

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patterns between group members. In two experiments 18 jackdaws will be tested in a group setting. Determination of the order of individuals successfully manipulating a testing apparatus and getting access to the testing apparatus will then be compared with the structure of the birds' networks to assess which networks influence the pattern of information transmission and which networks regulate access to limited resources. The results should show how individuals benefit from these respective networks.



Dr. Zsófia VIRÁNYI
(June 2006 - July 2009)

Zsófia Virányi studied biology at Loránd Eötvös 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, Loránd Eötvös 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. Currently she is coordinator of the ESF Research Networking Programme „Evolution of Social Cognition.“

Rationality and Attentional Coordination in Social Learning in Marmosets and Dogs

Rationales und aufmerksamkeitsgesteuertes soziales Lernen bei Krallenaffen 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:

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 Austausch-Stipendium Exchange Fellowship

Mag. Sebastian Voigt

(August 2008 - July 2010)

Sebastian Voigt studied biology in Hamburg and Innsbruck, where he specialized in physiology and embryology. He also attended courses in protein biochemistry and cell biology and carried out work on neotenic hemoglobin expression patterns in pupfish (*Cyprinodon*) in Umeå, Sweden, in 2001. He obtained his MA in zoology on physi-





ological maternal effects in zebrafish (Danio rerio) in Innsbruck in 2003. Until 2006 he studied veterinary medicine in Vienna. He is currently working on his PhD in biology at the University of Vienna.

DevoEvo of the Pupfish Genus *Cyprinodon*: A Phenotypic Engineering Approach

DevoEvo von Kärpflingen: Ein phaenotypischer Entwicklungszugang

The traditional, gene-centered view of the Modern Synthesis is losing ground against a perspective that focuses on development as the pacemaker of evolutionary innovation (DevoEvo). These rising theories, arranged around the phenomenon of phenotypic plasticity, are much in need of further experimental grounding. The proposed work on pupfish of the genus *Cyprinodon* is an effort to fill this gap. These tiny fish have been described as being able to “survive almost everything” (Soltz et al., 1978), and react with a high degree of phenotypic plasticity towards changing ecological conditions.

Environmental induction (West-Eberhard, 2003), epigenetic origination (Müller et al., 2005), and „neophenogenesis“ (Johnston et al., 1990) are potential mechanisms thought to underlie the origin of phenotypic novelty in changing environmental conditions. These concepts will be tested using closely related species of pupfish adapted to various kinds of extreme conditions. The empirical and experimental work of this project will focus on the “making of new species“ under artificial conditions (phenotypic engineering) and on fast evolving species in the laboratory of nature (Feder et al., 2000). The comparative physiological and morphological approach will include the use of advanced quantitative tools such as Micro-CT (Weninger et al., 2006) and Digital Motion Imaging (Schwerte et al., 2000).

2.5 Przibram-Stipendien Przibram Fellowships

23

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. She serves as an expert consultant for the European Commission on cognitive systems.

Factors Limiting the Evolution of Cultural Evolution Limitierende Faktoren in der kulturellen Evolution

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 behavior, 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 behavior, 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 behaviors 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.



Dr. Adrianna WOZNIAK
(September 2008 - August 2009)

Adrianna Wozniak obtained her European Doctorate at Jean Moulin University Lyon 3 in 2006. Her PhD thesis, "Evolutionary Theory of Knowledge: The Phylogenetic Relation from Representation to Object," was supervised by Dr. A. Reboul. Her research interests are in the philosophy of biology, evolutionary epistemology, and cognitive science. Before joining the KLI as a postdoctoral fellow Dr. Wozniak worked at the School of Computer Science, University of Windsor, Canada, on questions of speciation and biodiversity in simulated ecological communities.

Relativity in Evolutionary Causation

Relativität in der evolutionären Kausalität

With the Extended Evolutionary Synthesis (EES, here the Theory of Niche Construction and Evolutionary Developmental Biology), theoretical biology undeniably enters into a post-Synthesis period. We will show that causal asymmetry is inherent to the very notion of evolution by natural selection (in its Darwinian Moderns Synthesis version), according to which environmental factors differentiate fitness and selectively act on variation, the latter being thus selectively causally passive. We will argue that EES's understanding of natural selection makes a step toward a symmetric causality by showing that variation can determine its own fitness and thus its evolutionary fate. We will propose a model for symmetry in evolutionary causation (Relativity in Evolutionary Causation, REC); we use as an illustration the concept of causality underlying the General Theory of Relativity. We also will propose an individual-based simulation evaluating REC's predictions about the role of individual variation (measured by species abundance distribution) and especially of ontogenetic variation (e.g. stemming from learning) in the origin and spread of evolutionary novelty and speciation (measured by diversification rate). We will discuss REC's possible consequences for sympatric speciation as well as for the Baldwin effect and studies devoted to the evolution of language and social capacities.

2.6 Gastwissenschaftler Visiting Scientists

Dr. Denis WALSH

(September - October 2009)

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

Organisms: A Philosophical Introduction

ORganismen: Eine philosophische Einführung

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

Wissenschaftliche Veranstaltungen Meetings and Lectures

3



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 an das KLI 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.



21st Altenberg Workshop in Theoretical Biology 3-6 September 2009

Human EvoDevo: The Role of Development in Human Evolution

Organization: Philipp Gunz (MPI, Leipzig, Germany) and Philipp Mitteroecker (University of Vienna, Austria)

The topic

Evolutionary developmental biology has played a significant role in extending evolutionary theory and has led to numerous novel insights into evolutionary processes and in the patterns of organismal variability.

While many EvoDevo studies have focused on macroevolutionary questions such as the evolution of animal body plans, recent studies addressing the «micro-evolution» of development, partly based on formal developmental models or selection experiments, have further aimed to bridge EvoDevo theory and quantitative genetics. The emergence of new journals, societies, conferences, and workshops, all devoted to EvoDevo, is testament to the importance of EvoDevo for contemporary biology

The idea that evolutionary modifications of primate development might have led to the appearance of modern humans has a long history in anthropology and can be traced back to early evolutionary biologists and anthropologists such as Geoffroy Saint-Hilaire, Ernst Haeckel, Lois Bolk, and Adolph Schulz.

The aim of this workshop is to contribute to the theoretical and empirical corpus of human EvoDevo, to discuss problems and limitations, and to identify the



28 core themes underlying this scientific discipline. We are confident that the publication resulting from this workshop will be a strong signal to the anthropological community and also to evolutionary biologists, highlighting the importance of developmental approaches in the study of the evolution of mankind.

NIRMALA ARULRAYAN, RICARDO C. DEL ROSARIO, SHYAM PRABHAKAR
Computational & Mathematical Biology, Genome Institute of Singapore

Evolution of Gene Expression: Human- and Primate-specific Enhancers

TECUMSEH FITCH

Department of Neurobiology & Cognition, University of Vienna, Austria

Skyhooks and Spandrels: What can EvoDevo Tell us About the Evolution of Syntax?

FRIETSON GALIS

Institute of Biology, Leiden University, The Netherlands

An Evolutionary and Developmental Perspective on Congenital Abnormalities in Humans

PHILIPP GUNZ, SIMON NEUBAUER, JEAN-JACQUES HUBLIN

Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Germany

An EvoDevo Perspective on Hominin Cranial Evolution

BENEDIKT HALLGRIMSSON

Dept. of Cell Biology & Anatomy, University of Calgary, Canada

Taking the Middle Road: A Model Organism-based Approach to Human Evolutionary Developmental Biology

MARK W. HAMRICK

Department of Cellular Biology and Anatomy, Medical College of Georgia, GA, USA

Molecular and Developmental Mechanisms of Evolutionary Change in the Primate Limb Skeleton

JEAN-JACQUES HUBLIN

Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Germany

Did Ancient Hominins Grow Up Like Modern Humans?

JUKKA JERNVALL, STEPHEN J. KING

Institute of Biotechnology, University of Helsinki, Finland; Department of Ecology and Evolution, Stony Brook University, USA; Department of Anthropology, Stony Brook University, NY, USA

Simple Rules and the Evolution of Hominin Molars

STEVEN R. LEIGH

Department of Anthropology & Institute for Genomic Biology, University of Illinois, IL, USA

Brain Ontogeny and Human Life History Evolution

KIERAN P. McNULTY

Department of Anthropology, University of Minnesota, MN, USA

Connecting the Dots: Insights From and Limitations Of Studying Ontogenetic Processes in the Human Fossil Record

PHILIPP MITTEROECKER

Department of Theoretical Biology, University of Vienna, Austria

Evolution of Hominoid Cranial Development: Classical Theories and Modern Approaches

GERD B. MÜLLER

Department of Theoretical Biology, University of Vienna, Austria

EvoDevo's Theoretical Consequences

PAUL O'HIGGINS

Hull York Medical School, The University of York, UK

Virtual Quantitative Functional Morphology: A 21st Century Toolkit for the Study of Form and Function

MICHELLE SINGLETON

Department of Anatomy, Midwestern University, IL, USA

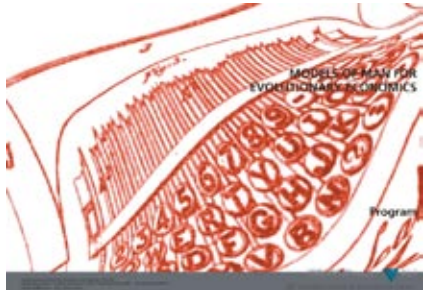
Postnatal Developmental Patterns and Papionin Cranial Diversity: A Model for Hominin Evolution?

ROBERTO TORO

Brain & Body Centre, University of Nottingham, UK

The Possible Shapes of the Human Brain

30



**22nd Altenberg Workshop in
Theoretical Biology
24-27 September 2009**

**Models of Man
for Evolutionary Economics**

Organization: Werner Callebaut (KLI),

Christophe Heintz (KLI), Luigi Marengo (Sant'Anna School of Advanced Studies, Pisa, Italy)

The topic

(Evolutionary) economics stands in need of a much more complex model of man than the one explicit (or implicit) in the neoclassical theory. Rather than (just) maximizing utility, the agent of evolutionary economics has habits of thought (Veblen), innovates (Schumpeter), and adopts behavioral routines (Nelson and Winter). She produces change and adapts to change in multiple ways; she is embedded in institutions; and her intentional actions in turn influence the design of the institutions she lives in. She thus fully participates in sociocultural and economic evolution. Today, the cognitive sciences and behavioral economics enable us to build much richer and more realistic models of the boundedly rational economic agent than was feasible hitherto.

Evolutionary theory multiply intersects with economics. Economic agents, as human beings, are the product of biological evolution; they make decisions and behave as evolved (and developing!) organisms. Institutions, technologies, and culture in general also evolve and make the economy evolve. Accounts of economic evolution can now be enriched by borrowing concepts and theories coming from the Extended Synthesis that is currently taking shape in evolutionary biology, and profit from developments in mathematical and computational science. How can these and other developments help evolutionary economics to accommodate a complex, more realistic, model of man and specify its role in economic evolution?

NAOMI BECK

Social Sciences Collegiate Division, University of Chicago, USA

Is The Market Order Moral? Faith and Reason in Hayek's Theory of Cultural Evolution

WERNER CALLEBAUT

Konrad Lorenz Institute for Evolution and Cognition Research, Austria
& Faculty of Sciences, Hasselt University, Belgium

The Place of Evolutionary Economics in an Extended Evolutionary Synthesis

KURT DOPFER

Department of Economics, University of St. Gallen, Switzerland

EvoDevo Goes Micro Meso Macro: Why Biology is the Mecca of Economics

EUGENE EARNSHAW

Department of History and Philosophy of Science and Technology, University of
Toronto, Canada

**Breaking the Bonds of Biology: Natural selection in Nelson and Winter's
Evolutionary Economics**

CHRISTOPHE HEINTZ

Konrad Lorenz Institute for Evolution and Cognition Research, Austria

Economic Routines Adapted to Local Reputation Systems

KARIN KNOTTENBAUER

Faculty of Business and Economics, Rheinisch-Westfälische Technische Hochschule
Aachen, Germany

Human Nature in Biologically Inspired Economic Theories

LUIGI MARENGO

Laboratory of Economics, Sant'Anna School of Advanced Studies, Pisa, Italy

**Where do Alternatives come from? Towards a Constructive Approach to
Collective Choice**

BERTIN MARTENS

DG Trade — European Commission, Brussels, Belgium

The Cognitive Mechanics of Economic and Institutional Evolution

KEVIN A. McCABE

Interdisciplinary Center for Economic Science, George Mason University,
Fairfax, VA, USA

**Neural Systems for the Efficient Harvesting of Joint Rewards Using Trust
Relationships**

KATHERINE NELSON

Graduate Center, City University of New York, USA

Human Nature in Evolutionary Developmental Psychology



32 RICHARD R. NELSON
School of International and Public Affairs, Columbia University, USA
Human Behavior and Cognition in Evolutionary Economics and Social Science

NIGEL NICHOLSON
Department of Organisational Behaviour, London Business School, UK
Leadership

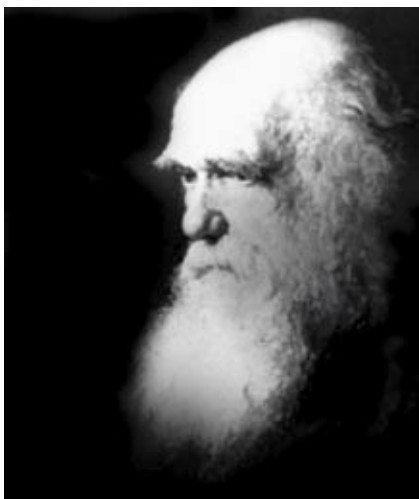
GERALD SILVERBERG
UNU-MERIT, Maastricht & IIASA, Laxenburg, Austria
Innovation as a Complex Collective Search Process

MARCO VALENTE
Faculty of Economics, University of L'Aquila, Italy
Evolutionary Modeling of Markets for Heterogeneous Goods

BERNARD WALLISER
Centre de Recherche en Analyse Socio-Economique de l'Ecole Nationale des Ponts et
Chaussées, Paris, France
Learning vs. Evolution: The Point of View of Game Theory

ULRICH WITT
Evolutionary Economics Group, Max Planck Institute of Economics, Jena, Germany
Evolutionary Economics and its Individualistic Foundations

3.2 Symposia Symposia organized and co-organized by the KLI



**EVO EVO! 200 Jahre Charles Darwin.
150 Jahre Evolutionstheorie**

**3 September - 11 October 2009
Künstlerhaus Wien**

Symposium und Ausstellung

*Organization: Peter and Ingeborg
Braunsteiner (Künstlerhaus Wien) and
Franz M. Wuketits (Universität Wien, KLI)*

Die Ausstellung

Das Künstlerhaus zeigt anlässlich des 200. Geburtstages von Charles Darwin und des 150-jährigen Jubiläums der Evolutionstheorie die Ausstellung „EVO EVO! 200 Jahre Charles Darwin. 150 Jahre Evolutionstheorie“.

Die Schau stellt erstmals die Kultur-Evolution in den Mittelpunkt und thematisiert mittels der zeitgenössischen bildenden Kunst die geistig- kulturellen Aspekte der Entwicklungsgeschichte. Eine Gruppe internationaler bildender KünstlerInnen hinterfragt, kommentiert und reflektiert die verschiedenen Theorien und herrschenden Ansichten über verborgene Entwicklungsvorgänge, seltsame Zeitabläufe, Mythenbildungen und Weltmodelle. Antriebssysteme der Bio- und Kultur-Evolution, die Entwicklung von Gestalt und Form sowie Zucht und Ordnung werden künstlerisch aufgearbeitet.

Der Gegensatz zwischen objektiver Realität und subjektivem Erleben und die unterschiedliche Wahrnehmung von Außen- und Innenwelt werden zur Diskussion gestellt, lineare, irreversible Prozesse und Grenzen der Wahrnehmung beleuchtet. Ein umfangreiches Begleit- und Vermittlungs-programm ergänzt die Ausstellung und ermöglicht den BesucherInnen ein tieferes Eintauchen in die Thematik.

Symposium „Darwins Kosmos - Bilderwelten / Weltbilder“

GERHARD ROTH
Institut für Hirnforschung, University Bremen
Die Evolution des freien Willens

CHRISTFRIED TÖGEL
Sigmund-Freud-Zentrum, Magdeburg
Von den Geschlechtsorganen des Aals zur Traumdeutung. Darwins Einfluß auf Freud

BEDA M. STADLER
Institute of Immunology, University Bern
Warum werden wir krank? Horizonte der Evolutionsmedizin

JOHANNA FORSTER
Friedrich-Alexander Universität Erlangen-Nürnberg
Evolution und Pädagogik. Ist der Mensch erziehbar?



34 WOLFGANG STEINIG

Sprach-, Literatur- und Medienwissenschaften, Universität Siegen

Vom Tanz zur Grammatik. Evolution der Sprache aus Rhythmus, Tanz und Musik

ECKART VOLAND

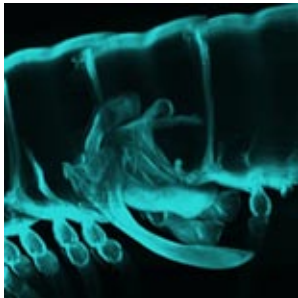
Zentrum für Philosophie, Universität Gießen

Gott hat Geschichte. Hat er auch Naturgeschichte?

FRANZ M. WUKETITS

Institut für Wissenschaftsphilosophie, Universität Wien

Warum das Böse fasziniert. Darwin und die Illusionen der Moral



**Summer School on
Evolutionary Developmental Biology**

14 - 17 September 2009

**Istituto Veneto di Scienze, Lettere ed Arti,
Venice**

Organization: Alessandro Minelli (University of Padova), Michael Akam (University Museum of Zoology, Cambridge), Gerd B. Müller (KLI), Giuseppe Fusco (University of Padova), and the Istituto Veneto di Scienze, Lettere ed Arti, Venice

GERD B. MÜLLER

University Vienna; KLI, Austria

Introduction to Evolutionary Developmental Biology

ALESSANDRO MINELLI and GIUSEPPE FUSCO

University of Padova, Italy

Post-embryonic Development, the Forgotten Ontogeny

EINHARD SCHIERENBERG

University of Cologne, Germany

Developmental Changes During Evolution at the Cellular Level

MICHAEL AKAM and JOHANNES JAEGER

University Museum of Zoology, University of Cambridge, UK

Gene Expression and Gene Networks: Possibilities and Limitations of Genetic Manipulation

STUART A. NEWMAN

New York Medical College, Valhalla, NY, USA

The Role of Physics in the Origination and Development of Biological Form

JUKKA JERNVALL and ISAAC SALAZAR-CIUDAD

University of Helsinki, Finland

Mathematical Modelling: Pattern Formation Mechanisms and their Role in Morphological Variation and Evolution

CLAUDIO ALONSO

University of Sussex, UK

Controlling Gene Outputs: Gene Regulation During Development and Evolution

RONALD JENNER

Natural History Museum, London, UK

Tree Thinking - The Importance of Phylogenetics in Evo-Devo

3.3 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.

THOMAS REYDON

Leibniz Universität Hannover

Natural Systems, Natural Kinds, and Other Elusive Aspects of Biological Classification

ECKEHART KÖHLER

University of Vienna & Lauder Business School, University of Applied Sciences, Vienna

Actors in Economics and Biology



36 JAN VERPOOTEN

University of Antwerp

Sensory Exploitation and the Emergence and Evolution of Human Artistic Behaviors

CHRISTINE SCHWAB

University of Vienna

Sociality in Corvids: Networks, Relations, and Social Learning

BERNHARD VOELKL

University of Vienna

The Biological Market Paradigm: A General Framework for Cooperation and Trading in Biological Systems

MASSIMO DI GIULIO

Institute of Genetics and Biophysics ,Adriano Buzzati Traverso', Naples

The Origin of the tRNA Molecule

ALVARO MORENO

University of the Basque Country, San Sebastian

The Origin of Functional Diversity in Prebiotic Evolution

ELIHU M. GERSON

Tremont Research Institute, San Francisco

Research on an Unusual Species: Problems from Hyena Biology

MILES MACLEOD

University of Vienna

What Natural Kinds Do for the Life Sciences: The `Epistemology Only` View

SABINA LEONELLI

EGENIS, Exeter, and London School of Economics

Bio-Ontologies as Theories

MICHEL DURINX

Theoretical Biology, Leiden University

Life Amidst Singularities - Evolutionary Consequences of Almost-faithful Replication

MARIANA BENÍTEZ

Universidad Nacional Autonoma de México

Spatial Model of Coupled Gene Regulatory Networks for Epidermal Patterning in *Arabidopsis*

NAOMI BECK

University of Chicago

Hayek's Evolutionary Road to Freedom: Complex Phenomena and Economic Prediction

PHILIPP MITTEROECKER

KLI

The Developmental Basis of Variational Modules in Micro- and Macroevolution: Studying the Space of Phenotypic Covariance Matrices

MATTHIAS SAMWALD

KLI

Making Progress in Making Progress

PETER BERZ

Zentrum für Literatur- und Kulturforschung Berlin

Morphogenetic Fields, Their Epistemology and Cultural Impact

MAXIMILIANO MARTÍNEZ

National University of Colombia, Bogotá

Natural Selection, Developmental Constraints, and Downward Causation

JOERI WITTEVEEN

University of Cambridge

Explorations of the Reproducer Perspective

ANDREAS WILKE

MPI for Human Development, Berlin, and Indiana University, Bloomington

Human Foraging Cognition: Putting Two Judgment and Decision-making Biases into an Ecological and Evolutionary Framework

Publikationen
Publications

4



*Wissenschaftliche Publikationen und
Vorträge von Fellows und permanenten
Mitarbeitern des KLI, sowie Artikel in
„Biological Theory“, die im Jahr 2009
erschienen sind.*

4.1 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.

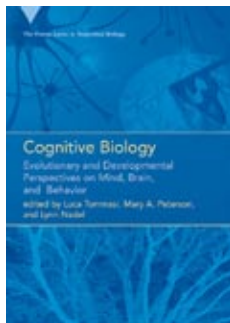
39

Neu erschienen Volume 10:



KROHS U, KROES P (eds).
**Functions in Biological and Artificial Worlds.
 Comparative Philosophical Perspectives.**
 Cambridge, MA: MIT Press.

Volume 11:



TOMMASI L., PETERSON MA, NADEL L (eds).
**Cognitive Biology. Evolutionary and Developmental
 Perspectives on Mind, Brain, and Behavior**
 Cambridge, MA: MIT Press.

Volume 12:



O'BRIEN MJ, SHENNAN SJ (eds).
**Innovation in Cultural Systems.
 Contributions from Evolutionary Anthropology.**
 Cognitive Biology
 Evolutionary and Developmental Perspectives on Mind, Brain,
 and Behavior Cambridge, MA: MIT Press.



40 Neuauflage in Paperback:

CALLEBAUT W, RASSKIN-GUTMAN D (eds).

Modularity

Understanding the Development and Evolution of Natural Complex Systems

Cambridge, MA: MIT Press.

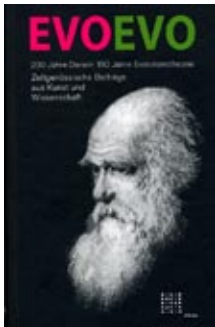
REID RGB.

Biological Emergences

Evolution by Natural Experiment

Cambridge, MA: MIT Press.

4.2 Bücher Books and Edited Volumes



BOGNER P. Hrsg.

EVO EVO: 200 Jahre Darwin.

150 Jahre Evolutionstheorie.

Künstlerhaus, Wien.

BRAUCKMANN S, BRANDT C, THIEFFRY D, MÜLLER GB. (eds).

Graphing Genes, Cells, and Embryos: Cultures of Seeing 3D and Beyond.

Preprint Series, Max Planck Institute for the History of Science, Berlin.

4.3 Fachartikel Professional Papers

BRYSON JJ.

Building Persons is a Choice. Commentary on Anne Foerst, „Robots and Theology“.

Erwägen Wissen Ethik 20(2): 195-197.

BRYSON JJ.

Representations Underlying Social Learning and Cultural Evolution.

Interaction Studies, 10(1): 77-100.

BRYSON JJ.

Age-Related Inhibition and Learning Effects: Evidence from Transitive Performance.

Proceedings of the Annual Meeting of the Cognitive Science Society: 3040-3045.

BRYSON JJ.

Crude, Cheesy, Second-Rate Consciousness.

In: The Second AISB Symposium Computing and Philosophy (Bishop M, ed), 10-15. Edinburgh UK.

BRYSON JJ.

Information Dissemination as an Explanation of Troop-Level Aggregation in Fission-Fusion Species with Varied Party Composition.

Folia Primatologica, 80(2): 111.

BRYSON JJ, TANGUY EAR.

Simplifying the Design of Human-Like Behaviour: Emotions as Durative Dynamic State for Action Selection.

International Journal of Synthetic Emotions 1(1): 30-50.

CALLEBAUT W.

Multi-scale phenomena in biology and scientific perspectivism.

In: Multiscale Phenomena in Biology. Proceedings of the 2nd Conference on Mathematics and Biology, Okinawa, Japan (Sinclair RM, Stiefel KM, eds), 57-69. Melville, NY: American Institute of Physics Conference Proceedings.

CALLEBAUT W.

Innovation from EvoDevo to Culture.

In: Innovation in Cultural Systems: Contributions from Evolutionary Anthropology (O'BRIEN MJ, SHENNAN SJ, eds), 81-95. Cambridge, MA: MIT Press.

CALLEBAUT W.

Fractals and Multi-scale Modeling in Biology [Editorial].

Biological Theory 3: 291-292.

CALLEBAUT W.

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Adaptive Rationality: An Evolutionary Perspective on Cognitive Bias.

Biennial meeting of the Society for the History, Philosophy, and Social Studies of Biology (SHPSB), Brisbane, Australia.

ZHAO J, JENTZSCH A, SAMWALD M, CHEUNG K-H.

Poster: Linked Data for Connecting Traditional Chinese Medicine and Western Medicine.

The Sixth International Workshop of Data Integration in the Life Sciences. Manchester, UK.

Weitere Aktivitäten Further Activities

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

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MAG. GUDRUN BRAUN

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



2009 wurde das Briefarchiv so gut wie fertiggestellt und die Photosammlung wie geplant für den Web-Zugriff vorbereitet. Für den Großteil der Photos existiert nun eine Beschreibung, die das Jahr, den Ort, den Anlass und die abgebildeten Personen umfasst. Ca. 1400 Photos wurden auf diese Art beschrieben und sollen 2010 auf einer durchsuchbaren Website für den kontrollierten Zugriff online gestellt werden.

Ebenso sollen 2010 Konrad Lorenz' wissenschaftliche Artikel in Form von PDFs der Öffentlichkeit zugänglich gemacht werden.



62 5.2 EUNICE Netzwerk EUNICE Network

In 2008 EUNICE, a European Network of Interdisciplinary Centers of Excellence, was founded, with the KLI as a participating institution.

EUNICE will offer a new type of postgraduate qualification focused on fostering advanced thinking skills. It addresses students that are heading for leadership positions in academia as well as in the public and private sector. The network will jointly grant a European degree of a Magister Cogitationis Artium (MCA). EUNICE is aimed to be specifically European in a twofold sense: It systematically tries to utilize the richness and variety of different scientific and cultural backgrounds. In addition the curriculum foresees work at three different nodes and, at least two different European countries. The goal of this is to help to develop personalities that combine the capability for cognitive leadership with a strong European identity.

Two preparatory meetings, one in Starnberg near Munich and the second on the island of Elba, Italy, were held in 2009. At present the participating institutions include:

- Institute for Neuroinformatics, Bielefeld
- Bioorganic Chemistry Group, Bochum
- Collegium Budapest
- Department of Neuroscience, Karolinska Institutet, Stockholm
- Konrad Lorenz Institute for Evolution and Cognition Research, Altenberg
- Munich Center for Neurosciences
- Parmenides Center for the Study of Thinking, Munich
- Scuola Internazionale Superiore di Studi Avanzati di Trieste
- Sony Computer Science Laboratory, Paris

5.3 Zusätzliche Förderungen Additional Funding

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