Veranstaltungskatalog IZWT

Wintersemester 2009/10
Sommersemester 2010

Wintersemester 2010/11
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Wintersemester 2011/12
Sommersemester 2012

IZWT
Interdisziplinäres Zentrum
für Wissenschafts-
und Technikforschung
www.izwt.de

IZWT

Interdisziplinäres Zentrum für
Wissenschafts- und Technikforschung

der Bergischen Universität Wuppertal,
Deutschland

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Bergische Universität Wuppertal
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42119 Wuppertal

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Wintersemester 2009/10

01.10.2009 - 31.03.2010

IZWT

KOLLOQUIUM WISSENSCHAFTSTHEORIE UND WISSENSCHAFTSGESCHICHTE

Termine im WS 2009/10

(ohne Ringvorlesung)

Mi. 18–20 Uhr, Raum N.10.20

28.10.2009	Textbesprechung	
11.11.2009	PD Dr. Volker **Remmert** Mainz	Eine Disziplin und ihre Verleger: Mathematisches Publizieren in Deutschland. 1871-1949
25.11.2009	Prof. Dr. Helmut **Pulte** Bochum	Darwin und die exakten Wissenschaften
09.12.2009	Prof. Dr. Manfred **Stöckler** Bremen	Demokrits Erben
13.01.2010	Prof. Dr. Klaus **Volkert** Wuppertal	Eine kurze Geschichte des mathematischen Raumes
27.01.2010	Klaus-Heinrich **Peters** Hamburg	Die Rolle der Mathematik in der Physik bei Dirac und von Neumann

Prof. Dr. Gregor Schiemann
Prof. Dr. Erhard Scholz

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Ringvorlesung „Herausforderung Klima Natur- und Wissenschaftsforschung im Handlungsdruck“

Vortragsreihe des Wuppertal Institutes für Klima, Umwelt, Energie GmbH und des Interdisziplinären Zentrums für Wissenschafts und Technikforschung (IZWT) an der Bergischen Universität Wuppertal im WS 2009/10:

> Der menschengemachte Klimawandel ist die Kehrseite des Konzepts der Industriegesellschaft, welches auf das 19. Jahrhundert zurückgeht. Der Versuch, diesen historisch präzedenzlosen Eingriff des Menschen in ein einmaliges System, das Erdsystem, wissenschaftlich zu erfassen, liegt über Kreuz mit den Ansprüchen üblicher Naturwissenschaft. Die Inkongruenz von Anspruch und Möglichkeit wird als, Unsicherheit von Szenarien' verstanden. Neuartig ist zudem der Hypothetizitätscharakter zentraler Aussagen über das Klima: Es muss der worst case beschrieben werden, um ihn praktisch demen-tieren zu können. Zukünftig kommt es auf die Etablierung einer Wissenschaft an, die auf integratives Wachstum (von einbezogenen Disziplinen) hinangelegt ist. Diese Komplexität erfordert ganz andere Wissenschaftsmanagement-methoden als tradiert, eher solche, die aus den Erfahrungen von Groß-forschungsprojekten der Grundlagenwissenschaft oder Industrie bekannt sind.

Jeweils um 18 Uhr an der Bergischen Universität Wuppertal
Hörsaal HS 05 (Gebäude G, Ebene10, Raum 07)
Campus Grifflenberg, Gaußstr. 20, 42119 Wuppertal

04.11.2009: Prof. Dr. Stefan Emeis, Institut für Meteorologie und Klimaforschung (IMK FZK), Garmisch-Partenkirchen
"Der Gang der Klimaforschung: Von empirischer Naturforschung zu einer moralischen Wissenschaft"

18.11.2009: Dr. Hans-Jochen Luhmann,Wuppertal Institut für Klima, Umwelt, Energie, Wuppertal
"Klimawissenschaft: Forschung als Börsenfaktor"

02.12.2009: Prof. Dr. Ralf Koppmann, Bergische Universität Wuppertal; Fachbereich Mathematik und Naturwissenschaften (‚Atmosphärenphysik')
"Klimawandel: Was passiert mit der Erdatmosphäre?"

Jeweils um 18 Uhr in der Aula des Wuppertal Instituts Döppersberg 19, 42103 Wuppertal:

16.12.2009: Prof. Dr. Hartmut Grassl, MPI für Meteorologie, Hamburg
„Das 2°C-Ziel: Politische Dilemmata bei wissenschaftsgetriebenem Handeln“

06.01.2010: Prof. Dr. Amy Dahan-Dalmedico, Centre Alexandre Koyré, Centre de Recherche en Histoire des Sciences et des Techniques, Paris
"The interactions of Science and Policy in the Climate regime"

20.01.2010: Dr. Gabriele Gramelsberger, Institut für Philosophie, FU Berlin
"Das Geltungsparadox der Klimamodelle"

03.02.2010: Prof. Dr. Dieter Birnbacher, Philosophisches Institut, Heinrich Heine Universität Düsseldorf
"Klimaverantwortung als Verteilungsproblem"

Sommersemester 2010

01.04.2010 - 30.09.2010

IZWT

KOLLOQUIUM WISSENSCHAFTSTHEORIE UND WISSENSCHAFTSGESCHICHTE

Termine im SS 2010

Mi. 18 c.t. - Raum N.10.20

28.04.2010	**Dr. Ralf Krömer (Universität Siegen)**	**Die „Zankbirne“. Zu Poincarés Arbeiten über Gleichgewichtsfiguren rotierender Flüssigkeitsmassen**
05.05.2010	**Kein Vortrag**	
19.05.2010	**PD Dr. Cord Friebe (Universität Bonn)**	**Das Block-Universum und der Eternalismus: Eine Rekonstruktion der Putnam/Stein-Kontroverse**
02.06.2010	**Dr. Arianna Borrelli (BU Wuppertal)**	**Symbolische Notation als heuristisches Werkzeug der theoretischen Physik: Der Fall des "Quantenzustands"**
09.06.2010	**Eduardo Giovannini (Paderborn)**	**Intuition and Foundations in Hilbert’s Early Axiomatic Approach to Geometry**
16.06.2010	**Dr. Dr. Claus Beisbart (TU Dortmund)**	**Welchen Beitrag liefern Computersimulationen zum naturwissenschaftlichen Erkenntnisgewinn?**
23.06.2010	**Ph. Dr. Skùli Sigurdsson (Berlin)**	**Niels Bohr, Como und Columbia Universität: Rede mit Unterbrechungen**
30.06.2010	**Prof. Dr. Dr. Friedrich Hofmann (BU Wuppertal)**	**Tödliche Welten – Die Entstehung der Mikrobiologie zwischen dem deutsch-französischen Krieg und dem Ersten Weltkrieg**
DIENSTAG **06.07.2010** ***N.10.12!***	**Dr. Caspar Hirschi (University of Cambridge)**	**Die Rolle des Experten im 18. Jahrhundert. Gelehrte an der Schnittstelle von Wissen und Macht in Frankreich und England**
14.07.2010	**PD. Dr. Bertold Schweitzer**	**Mechanismen und Fehler: Konzepte der Analyse biologischer Systeme**

PD Dr. Volker Remmert
Prof. Dr. Gregor Schiemann
Prof. Dr. Erhard Scholz

Sie sind herzlich eingeladen !

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Tagungen & Workshops

Towards a Theory of Spacetime Theories The construction of a (meta-)theory of scientific theories is surely at the very heart of the philosophy of science. However, many attempts in this direction have aimed to construct a theory of scientific theories per se, thereby neglecting that a theory in physics may be very different from one in biology, that even a theory in particle physics may be of a different structure than one in solid state physics. It thus seems sensible to restrict attention first to the development of a meta-theory of a more restricted set of scientific theories, for example to theories that share a domain of application.

A paradigm case is the class of spacetime/gravitation theories, developed as variants and rivals of Einstein's theory of General Relativity (GR). There has been some explicit work by physicists with the common aim of constructing a framework to systematise and compare theories of gravitation, some focusing on the experimental and some on the theoretical foundations of such theories. But none of these approaches has been looked at by philosophers. On the other hand, the relevance of recent philosophical and historical work on the foundations of spacetime theories (such as the role of formal vs substantive general covariance, the connection between symmetries and conservation laws, or the structure and history of mathematical extensions of GR) for the meta-theoretic project has not yet been taken into account either.

A meta-theory of spacetime theories would i) reveal insights about the specific theories by showing the similarities and differences for every member of the set of theories it covers, ii) deliver a framework for a class of theories that could be helpful as a blueprint to build other meta-theories; and iii) provide a higher-level viewpoint for judging which theory best describes nature.

The Interdisciplinary Centre for Science and Technology Studies at the University of Wuppertal, Germany, will host a workshop in order to bring together experts from physics and philosophy and history to discuss the topics mentioned above, in the hope to better understand spacetime and the theories describing it.

Towards a Theory of Spacetime Theories

International Workshop

21.-23. Juli 2010

Participants include:

Harvey Brown (Oxford)
Jeroen van Dongen (Utrecht)
Friedrich Hehl (Köln)
Claus Kiefer (Köln)
Eleanor Knox (London)
Dennis Lehmkuhl (Wuppertal)
Oliver Pooley (Oxford)
David Rowe (Mainz)
Erhard Scholz (Wuppertal)
Adan Sus (Barcelona)
David Wallace (Oxford)
James Weatherall (Irvine)
Clifford Will (St Louis)
Chris Wüthrich (San Diego)

Bergische Universität Wuppertal
Campus Grifflenberg
Senatssaal (P.08.14)

Details and Registration:
www.izwt.uni-wuppertal.de

Fritz Thyssen Stiftung

IZWT Interdisziplinäres Zentrum für Wissenschafts- und Technikforschung
Normative und historische Grundlagen

BERGISCHE UNIVERSITÄT WUPPERTAL

Fritz Thyssen Stiftung
FÜR WISSENSCHAFTSFÖRDERUNG

BERGISCHE UNIVERSITÄT WUPPERTAL

Towards a Theory of Spacetime Theories

Programme

First Day, Wednesday July 21:
Classical GR and Cosmology

09.30 - 10.00: Lehmkuhl, Scholz, Schiemann (Wuppertal):
`Welcome´

Chair: Harvey Brown (Oxford)

10.00 - 11.15: David Rowe (Mainz):
`Mach's Principle and Early Debates on de Sitter's Model in Relativistic Cosmology´

11.15 - 11.45: **Coffee**

11.45 - 13.00: Claus Beisbart (Dortmund)
`Space-time Theories at Sea: The Case of Cosmology

13:00 - 14.30: **Lunch**

Chair: Erhard Scholz (Wuppertal)

14.30 - 15.45: Adan Sus (Barcelona):
`The physical significance of symmetries from the perspective of conservation laws´

15:45 - 16.15: **Coffee**

16.15 - 17.30: Clifford Will (St Louis):
`The Confrontation between General Relativity and Experiment.´

19:30: **Conference Dinner** in Wuppertal‘s Old Town

Programme

Second Day, Thursday July 22:
Comparing GR to other Spacetime Theories

Chair: Chris Wüthrich (San Diego)

09.30 - 10.45: Dennis Lehmkuhl (Wuppertal):
`Some Kinds of Gravitation Theories´

10.45 - 11.15: **Coffee**

11.15 - 12.30: Erhard Scholz (Wuppertal):
`Paving the way for transitions' between theories --- the case for Weyl geometry´

12:30 - 14.00: **Lunch**

Chair: Gregor Schiemann (Wuppertal)

14.00 - 15.15: Oliver Pooley (Oxford)
`Varieties of ``General Covariance‘‘´

15:15 - 15.30: **Coffee**

15.30 - 16.45: David Wallace (Oxford):
`Local and Global Symmetries´

16.45 - 17.15: **Coffee**

17.15-18.30: James Weatherall (Irvine):
`On the Status of the Geodesic Principle in Newtonian and Relativistic Physics´

Programme

Third Day, Friday July 23:
Gauge- and Quantum-Spacetimes

Chair: Oliver Pooley (Oxford)

09.30 - 10.45: Friedrich Hehl (Köln):
`Gauge Theories of Gravitation´

10.45 - 11.15: **Coffee**

11.15 - 12.30: Eleanor Knox (London):
`Interpreting Geometry: Lessons from teleparallel theory´

12:30 - 14.00: **Lunch**

Chair: Domenico Giulini (Hannover)

14.00 - 15.15: Claus Kiefer (Köln):
`From spacetime to superspace and holonomies - new concepts from quantum gravity´

15:15 - 15.30: **Coffee**

15.30 - 16.45: Chris Wüthrich (San Diego):
`Raiders of the lost spacetime´

16.45 -17.15: **Coffee**

17.15-18.30: Surprise
`Joker-Talk´

Abstracts

David Rowe (Mainz): Mach's Principle and Early Debates on de Sitter's Model in Relativistic Cosmology

Abstract: Starting with some reflections on longstanding difficulties connected with the global properties of spacetimes, I take up the special case of what are sometimes called Machian spacetimes. A modern version of such gadgets was set forth by John Wheeler in the 1960s as part of a research program that aimed to implement Machian relativity while solving the Cauchy problem in GR. By this time cosmologists had long grown accustomed to the idea that large families of mathematical spacetimes might be taken as candidates for modelling the universe. This tradition, however, has an interesting prehistory going back to the birth of relativistic cosmology with its two competing models: Einstein's cylindrical world and the far more elusive alternative due to Willem de Sitter. The latter became the object of an interesting debate that began with de Sitter's objection to Mach's principle and culminated with a series of exchanges over the nature of what appeared to be a region of singularities at the edge of de Sitter space. Einstein was convinced that just beyond this horizon lay hidden masses that accounted for spatial curvature effects, an opinion supported at first by Hermann Weyl, who shared Einstein's conviction that global curvature required distant matter. Both read a great deal of physics into these early mathematical models for modern cosmologies. In the fifth and final edition of Raum-Zeit-Materie, however, Weyl began to have doubts about Einstein's version of Mach's principle. He now advanced some equally speculative arguments in favour of de Sitter space rather than Einstein's cosmological model. Meanwhile, Felix Klein used projective geometry to show that the alleged singularities of de Sitter space could be removed by coordinate transformations. His approach, however, raised another difficulty, namely the appearance of closed time-like curves, a problem Einstein had worried about when he lectured in Göttingen back in 1915. He was therefore at least vaguely aware of certain fundamental spacetime problems from the beginning.

Claus Beisbart (Dortmund): Space-time Theories at Sea: The Case of Cosmology

Abstract: One of the tasks that physical cosmology has is to identify the global structure of the Universe. From the viewpoint of the General Theory of Relativity this is in particular to fix global properties of our space-time. Now, from a historical point of view, much work in cosmology relies upon the Cosmological Principle (CP). Roughly, the principle has it that, at large scales, the Universe is spatially homogeneous and isotropic about every observer. But if the principle is to do some work, it has to be rendered more precise. In this talk, I will follow attempts to render the principle more precise while assuming as a background a. Newtonian physics, or b. relativistic physics. My aim in this is to elucidate the differences between the Newtonian and the relativistic understandings of the space-time and to point out the consequences for cosmology.

For the purposes of exposition, I will raise three questions concerning the above formulation of the CP: 1. What is meant by the Universe, i.e. what kind of thing or things do homogeneity and isotropy apply to? 2. What is meant by

spatial homogeneity and isotropy? Both notions may of course be understood as invariances under some transformations, but there is a certain question how this invariance is to be understood. 3. What does the qualification ``at large scales" mean? The challenge is to answer all of these questions at the same time. For answering the first two questions, assumptions on the space-time and on the ontology are required, and theories such as Newtonian physics and the General Theory of Relativity are natural candidates to start with. Concerning the third question, I discuss coarse-graining and a statistical approach. It turns out that we can consistently answer the questions from the viewpoint of Newtonian physics, although this does not lead to a model of the theory. We have a much harder time answering the three questions assuming General Relativity, and I will point out related problems. This does not prevent cosmologists from using the principle, but one of my conclusions is that present-day cosmology does not consistently apply one elaboration of the cosmological principle. Rather, the principle is used in slightly different versions -- it has several faces.

Adan Sus (Barcelona): `The physical significance of symmetries from the perspective of conservation laws´

Abstract: The physical significance of symmetries in physical theories has been a matter of discussion in recent times. Although there seems to be no problem with the interpretation of global spacetime symmetries, there is no consensus in relation to the empirical import of gauge symmetries and local spacetime symmetries. Nonetheless, the conventional wisdom seems to be that global but not local symmetries have empirical significance due to the fact that global, but not local, transformations have an active interpretation. The physical intuition linked to this is that some symmetries (gauge and local spacetime ones) connect different mathematical representations of the same physical situation while others connect different physical states.

Furthermore, it is well known that there exists a relationship between symmetries and conservation laws that, for Lagrangian theories, is encoded by Noether's theorems. Here conventional wisdom goes like this: it is global symmetries, through Noether's First Theorem (NFT), that are related to conservation laws. Less known is the fact that for theories with local symmetries, because they necessarily have global subgroups as symmetry groups, Noether's first theorem is also applicable, but this time producing conservation laws with a less clear physical status. Noether herself introduced the terminology of proper and improper conserved current to distinguish between the ones found in theories without and with local symmetries. In principle, there is a sense in which presence of local symmetries trivialises the conserved quantities obtainable but recent work shows that things are not so simple; even in theories with local symmetries with certain boundary conditions some conserved quantities can be defined that resemble the ones obtained in theories for which the global symmetry group is not extended by a local one.

The aim of this talk is twofold: First, to bring together these two discussions and show that such a conjunction produces interesting results. I argue that introducing the relationship to conservation laws in the discussion about the physical significance of symmetries can help to discriminate between different types of symmetries (proper conservation laws are good indication of physical

significance). The second objective is to introduce a much needed philosophical discussion about the status of the different types of conserved currents obtained in physical theories with local symmetries.

Clifford Will (Washington University, St. Louis and Institut d'Astrophysique de Paris): The Confrontation between General Relativity and Experiment

Abstract: We review the experimental evidence for Einstein's general relativity. Tests of the Einstein Equivalence Principle support the postulates of curved spacetime, while solar-system experiments strongly confirm weak-field general relativity. We describe the status of the recently concluded Gravity Probe B experiment, and of observations of binary pulsar systems. Future tests of the theory in the radiative and strong-field regimes may be possible using gravitational-wave observatories on Earth and in space, and using observations of stars orbiting the central black hole in our galaxy.

Dennis Lehmkuhl (Wuppertal): Some Kinds of Gravitation Theories

Abstract: I discuss different kinds of spacetime theories, partly building on an almost neglected classification scheme by Throne, Lee and Lightman (TLL), entitled `Foundations for a Theory of Gravitation Theories´. TTL discuss different kinds of covariance groups, trajectories, variables and representations that can be present in a gravitation theory. I criticise their definitions and add to their toolbox of classificationary tools the distinction between different kinds of coupling in Lagrangian theories, different kinds of field equations, spacetime structure and relationships between particle trajectories and field laws.

Erhard Scholz (Wuppertal): ‘Paving the way for transitions’ between theories — a case for Weyl geometry

Abstract: At the occasion of this workshop I want to discuss Weyl geometric gravity, enriched by a scale covariant scalar field in the sense of (Dirac 1973), in the function of an “operative” metatheory. ‘Metatheory’ is here understood in the sense of “paving the way for transitions (Übergänge bahnen)” (J.F. Herbart) between the concepts of different sciences or subdisciplines. The ‘transitions’ concerned here are:

– those between the different ‘frames’ of Jordan-Brans-Dicke theory and Weyl geometric rescalings,
– the problematic transition from classical foundations of gravity in the sense of Ehlers/Pirani/Schild (1972) to quantum structures like in Audretsch/Gähler/Straumann (1983), Hung Cheng (1988), and perhaps Flato/Raçka (1988),
– the possibility to re-read the potential of the Higgs-field of the standard model in Dirac-Weyl theory, similar to (Smolin 1979,Drechsler/Tann 1999, Nishina/Rajpoot 2007, Foot e.a. 2007) but with even simpler assumptions — paving the way for a nice ‘transition’ between theories [at least formally],
– rescaling of Robertson-Walker models of cosmology in the framework of Weyl geometry (Scholz 2009).

In the talk I shall chose two or three items and only mention the other one(s).

Oliver Pooley (Oxford): Varieties of ``General Covariance"

Abstract: What, exactly, are ``substantive general covariance", ``active diffeomorphism invariance" and ``background independence"? In this talk I aim to pinpoint a number of relevant features that a theory might possess. Not all of these features are familiar from, or carefully distinguished in, the literature on general covariance. I will consider their implications for the ontology and ideology of spacetime.

David Wallace (Oxford): Symmetry, locality, and space

Abstract: I attempt to square the circle between (a) the view that two situations, related by a symmetry, are the same situation differently described (so that symmetry can seem like an inessential consequence of our choosing an excessive mathematical formalism), and (b) the manifest fact that symmetries - local and global - seem to play an absolutely essential role in physical theories (so that they seem like features of the theory itself, not just of our formulation of it). In doing so, I hope to cast some light on the relationship between symmetries and the spaces of which they are symmetries, and also on the gauge principle.

James Owen Weatherall (Irvine): `On The Status of the Geodesic Principle in Newtonian and Relativistic Physics´

Abstract: The geodesic principle is one of the central principles of General Relativity (GR). It states that free massive test point particles traverse timelike geodesics. The precise sense in which the geodesic principle can be understood as a theorem in GR has been of some interest recently to philosophers of physics, at least in part because it touches on an old question in the philosophy of space and time concerning the relationship between spacetime geometry and inertial motion. I will present a recent result to the effect that in geometrized Newtonian theory (sometimes Newton-Cartan theory), the geodesic principle can also be understood as a theorem. I will also discuss the senses in which, given this theorem, Newtonian physics can be said to explain inertial motion, keeping in mind the relation between my theorem and its equivalent in GR. I believe the theorem I discuss is of independent interest; however, its philosophical payoff will be that the status of the geodesic principle in Newtonian physics is, mutatis mutandis, strikingly similar to the relativistic case in a way that can be made perfectly precise.

Friedrich Hehl (Köln): Gauge Theories of Gravitation

Abstract: The starting point of any gauge theory of gravity is the conserved energy-momentum current and the related translational invariance in special relativity. The corresponding gauge theory is the `Einsteinian' teleparallel theory of gravity that, for spinless matter, is equivalent to general relativity. Extensions are possible from the

translation group to the (super-)Poincar\'e group or to the 4-dimensional (super-)affine group. The essential geometrical structure in any gravitational gauge theory is the linear connection Γ of spacetime, see
http://arxiv.org/pdf/gr-qc/9602013.

Eleanor Knox (London): `Interpreting Geometry: Lessons from teleparallel theory´

Abstract: I examine the circumstances under which mathematically geometrical objects may be said to represent the structure of spacetime, and argue that the geometrical status of the metric in GR is a more subtle matter than is often assumed. To illustrate the case, I discuss the teleparallel theory of gravity, a theory generally held to be empirically equivalent to general relativity, but to involve a very different geometry. I argue that the geometrical structures in the teleparallel theory cannot possibly be taken at face value, and that the theory is, in fact, a reformulation of general relativity.

Claus Kiefer (Köln): From Spacetime to Superspace and Holonomies --- New concepts from quantum gravity

Abstract: One of the biggest open problems in physics is the consistent unification of quantum theory with general relativity, resulting in a theory of "quantum gravity". Such a theory would have an important bearing upon the physics of the early universe, the understandingof black holes, and the structure of spacetime. In my talk I shall give a brief introduction into the main approaches to quantum gravity and discuss their relevance for our understanding of space and time. These approaches include quantum geometrodynamics, loop quantum gravity, and string theory. While time as a classical concept has vanished completely, there are indications that space can have
discrete features or may appear in a holographic sense only.

Chris Wüthrich (UCSD): Raiders of the lost spacetime

Abstract: Spacetime as we know and love it is lost in most approaches to quantum gravity. For many of these approaches, as inchoate and immature as they are, one of the main challenges is to relate what they take to be the fundamental non-spatiotemporal structure of the world back to the classical spacetime of general relativity. Time permitting, I will discuss this problem and sketch potential solutions for two approaches to quantum gravity, loop quantum gravity and causal set theory.

Wintersemester 2010/11

01.10.2010 - 31.03.2011

IZWT

KOLLOQUIUM WISSENSCHAFTSTHEORIE UND WISSENSCHAFTSGESCHICHTE

Termine im WS 2010/11

Mi. 18 c.t. - Raum N.10.20

13.10.2010	Prof. Dr. Jed Buchwald Kalifornien	*Knowledge in the Early Modern Era: The Origins of Experimental Error*
27.10.2010	Textbesprechnung (Michael Friedmann)	*Dynamics of Reason - The 1999 Kant Lectures at Stanford University*
17.11.2010	Arbeitsgruppe Prof. Dr. Ute Planert Wuppertal	*Vorstellung Projekt:* *Popularisierung der Eugenik in Deutschland, Spanien und den USA*
24.11.2010	Dr. Olivier Schlaudt Heidelberg	*Otto Hölder und das Hebelgesetz*
08.12.2010	Dr. Gerhard Rammer Berlin	*Einflüsse von Urideen und Begriffsgeschichte auf Theoriebildung am Beispiel unterschlächtiger Wasserräder*
Vortrag fällt aus ! 22.12.2010	Dr. Meinard Kuhlmann Bremen	***Der Vortrag fällt leider aus!*** *Teilchen, Strukturen und Tropen:* ***Zur Interpretation der fundamentalen Physik***
12.01.2011	Prof. Dr. Joël Sakarovitch Paris	*The scientific works of Philippe de La Hire (1640-1718) : between Geometry, Mechanics and Architecture*
Vortrag fällt aus ! 26.01.2011	Dr. Koray Karaca Wuppertal	***Der Vortrag fällt leider aus!*** *The notion of ad hocness and the Higgs mechanism*

Prof. Dr. Gregor Schiemann
Prof. Dr. Erhard Scholz

Weitere Informationen lesen sie unter: www.izwt.uni-wuppertal.de

IZWT Interdisziplinäres Zentrum für Wissenschafts- und Technikforschung Normative und historische Grundlagen

Was war und was ist Materie?

Vorträge WS 2010/11 — Mittwoch 18:15 Uhr, vierzehntägig, Hörsaal HS 5 (G.10.07)

20.10.2010 Prof. Dr. Wolfgang F. Haug (Universität Berlin)
► Gott oder Natur? Das Materieproblem der Philosophie

03.11.2010 Prof. Dr. Christoph Meinel (Universität Regensburg)
► Adams neue Augen: Die Rolle der Anschauung in den Korpuskulartheorien der frühen Neuzeit

01.12.2010 Dr. Dr. Norman Sieroka (Universität Zürich)
► Materieverständnis im 20. Jahrhundert - Eine philosophische Rekonstruktion

15.12.2010 Prof. Dr. C. Kiefer (Universität Köln)
► Der Quantenkosmos - Von der zeitlosen Welt zum expandierenden Universum

19.01.2011 Prof. Dr. Michael Tausch (Universität Wuppertal)
► Materie, Masse, Energie aus Sicht der Chemie

02.02.2011 Prof. Dr. Peter Mättig (Universität Wuppertal)
► Der Begriff der Materie aus der Sicht der Physik

Der Materiebegriff war seit Menschengedenken Gegenstand philosophischer und wissenschaftlicher Untersuchungen. Er hat viele Umformungen durchlaufen und besitzt auch heute noch viele Gesichter. In der Physik werden zur Zeit hohe Erwartungen dahingehend geäußert, dass die bisher aufwendigste Experimentaleinrichtung der Menschheitsgeschichte, der LHC (Large Hadron Collider) am CERN, neues Licht auf den subatomaren Aufbau der Materie werfen kann.
Die Perspektive der Hochenergiephysik ist freilich nur eine unter vielen. Andere Wissenschaften und Techniken — der Natur, der Gesellschaft, der Ökonomie und der Kultur — hatten und haben andere Perspektiven auf das, was als Materie fungiert und in ihren Forschungs- oder Handlungsgegenstand eingeht. Nicht weniger vielfältig waren und sind die philosophischen Ansichten über die Materie.
Im Rahmen dieser Ringvorlesung soll ein kleiner, aber sicherlich anregender Ausschnitt aus dem Reigen der Materieauffassungen in Vergangenheit und Gegenwart Revue passieren, um mögliche Entwicklungstendenzen zu diskutierten. Streben die unterschiedlichen Auffassungen einer Konzeption zu, die immer stärker an den Naturwissenschaften orientiert ist?

Die Vorträge finden im Rahmen des Kolloquiums Wissenschaftsgeschichte und Wissenschaftsphilosophie statt (Prof. Dr. G. Schiemann und Prof. Dr. E. Scholz).
Aktuelle Informationen unter: www.izwt.uni-wuppertal.de

BERGISCHE UNIVERSITÄT WUPPERTAL

Sommersemester 2011

01.04.2011 - 30.09.2011

IZWT

KOLLOQUIUM WISSENSCHAFTSTHEORIE UND WISSENSCHAFTSGESCHICHTE

Termine im SS 2011

Mi. 18 c.t. - Raum N.10.20

20.04.2011	Dr. Koray **KARACA** Wuppertal	***The notion of ad hocness and the Higgs mechanism***
27.04.2011	**Kein Vortrag**	
MONTAG 02.05.2011	Prof. Dr. Dimitri **GINEV**	***Grundzüge einer hermeneutischen Wissenschaftstheorie***
11.05.2011	Prof. Dr. Gerald **HARTUNG**	***Welche Natur brauchen wir? Anthropologische Dimensionen des Umgangs mit Natur***
18.05.2011	**Kein Vortrag**	
25.05.2011	Prof. Dr. Robert **SANDERS**	***Early observations of galaxy rotation curves: history as revelation***
01.06.2011	Dr. Boris **HEITHECKER**	***Eine totgeborene Spielerei? Was Goethes Farbenlehre ist und was man mit ihr anfangen kann***
08.06.2011	Dr. Meinard **KUHLMANN**	***Das Mobiliar der Quantenwelt - Teilchen, Felder, Strukturen oder Tropen?***
22.06.2011	Dr. Martin **HELLMANN**	
DIENSTAG 28.06.2011	Prof. Dr. Martin **FÜSSEL**	***Gelehrte Streitkulturen: Zur sozialen Praxis des Gelehrtenstreits im 17. und 18. Jahrhundert***
06.07.2011	Dr. Charlotte **WERNDL**	***Unterdeterminiertheit, Indirekte Evidenz und die Wahl zwischen eterministischen und indeterministischen Modellen***
13.07.2011	Prof. Dr. Pavel **KROUPA**	***Testing the current standard cosmology and directions towards a new model***

Prof. Dr. Gregor Schiemann
Prof. Dr. Erhard Scholz
Prof. Dr. Volker Remmert

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BERGISCHE UNIVERSITÄT WUPPERTAL

Wintersemester 2011/12

01.10.2011 - 31.03.2012

IZWT

KOLLOQUIUM WISSENSCHAFTSTHEORIE UND WISSENSCHAFTSGESCHICHTE

Termine im WS 2011/12

Mi. 18 c.t. - Raum N.10.20

MONTAG **Raum O.11.40** 17.10.2011	Prof. Dr. Martin Carrier	*Werte und Objektivität in der Wissenschaft.*
MONTAG **HS 04 (F.10.01)** 24.10.2011 **17 Uhr**	Dr. Allan Franklin	*Experiment, Then and Now*
30.11.2011	Dr. Jeroen van Dongen	*Rewriting the histroy of the light quantum: the Einstein-Rupp experiments*
14.12.2011	Prof. Dr. Helmut Maier	*Chemikervereine im Nationalsozialismus: Privilegierung eines Berufsstandes?*
11.01.2012	Prof. Dr. Ulrich Charpa	*Historische und systematische Aspekte einer reliabilistischen Wissenschaftsphilosophie*
25.01.2012	Prof. Dr. Dirk Schlimm	*Pasch's philosophy of mathematics*

Prof. Dr. Volker Remmert
Prof. Dr. Gregor Schiemann

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BERGISCHE UNIVERSITÄT WUPPERTAL

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Philosophisches Kolloquium

EINLADUNG ZUM KOLLOQUIUM

Prof. Dr. Martin Carrier

(Universität Bielefeld)

Werte und Objektivität in der Wissenschaft: Wertgeladenheit, Pluralismus und die epistemische Einstellung.

Beleuchtet werden sollen Merkmale von epistemischer Forschung oder Grundlagenforschung (im Gegensatz zu anwendungsorientierter Forschung). Ich erörtere die Rolle von Werten in Prüf- und Bestätigungsverfahren in der Wissenschaft. Werthaltungen sind zunächst subjektiv und könnten entsprechend die Objektivität der Wissenschaft beeinträchtigen. Ich argumentiere, dass eine pluralistische, nicht-Baconsche Objektivität, die auch auf eine Pluralität von Werten einschließt, viele Intuitionen bewahren kann, die herkömmlich mit Objektivität verbunden werden. Wissenschaftliche Forschung ist jedoch zusätzlich durch eine Verpflichtung auf gemeinsame epistemische Ziele zu charakterisieren. Hierin drückt sich eine geteilte epistemische Haltung aus, die sich in Verfahrensregeln für den Umgang mit Wissensansprüchen niederschlägt. Pluralismus und Konsensbildung sind miteinander vereinbar, wenn sie auf unterschiedlichen Ebenen angesiedelt werden.

Martin Carrier, Studium der Physik, Philosophie und Pädagogik an der Univ. Münster, 1984 Promotion in Philosophie ebd., 1989 Habilitation an der Univ. Konstanz. 1994–1998 Professor für Philosophie an der Universität Heidelberg, ab 1998 Professor für Philosophie an der Universität Bielefeld. Mitglied der Deutschen Akademie der Naturforscher Leopoldina, der Akademie der Wissenschaften und der Literatur Mainz und der Academia Europaea. Leibniz-Preis der DFG für 2008. Hauptsächliches Arbeitsgebiet: Wissenschaftsphilosophie mit Schwerpunkten bei Wissenschaftsentwicklung und Theorienwandel, Theoriebeladenheit und empirischer Prüfung, intertheoretischen Beziehungen und Reduktionismus sowie der Methodologie angewandter Forschung.

Montag, 17.10.2011
18 c.t. Uhr
Raum O.11.40

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EINLADUNG ZUM KOLLOQUIUM

Prof. Ph.D. Allan Franklin

(Department of Physics, University of Colorado)

Experiment, Then and Now

One interesting aspect of high-energy physics from the 1960s to the present has been the changes in the statistical criterion required for a discovery claim. In this talk I will discuss these changes as well as other changes in the reporting of experimental results, particularly those involving elementary particles from 1893, the publication date of Volume 1 of Physical Review to the present. Topics will include the problem of exclusion of data and the selection of data, the scale of experiments, the change in from a very realistic presentation of an experiment to a more schematic presentation, and the amount of historical detail presented. Examples will include Robert Millikan's oil drop experiments, Edwin Hall's experiments on falling bodies, and some recent experiments on the pentaquark.

Dr. Allan Franklin Professor Franklin's research is on the history and philosophy of science, with particular emphasis on the role of experiment in physics. He has done historical studies on parity conconservation, CP-violation, and Millikan's oil drop experiment. On the philosophical side, he has worked on the Duhem-Quine problem, the question of how one can localize support or refutation, and on confirmation theory, using a Bayesian approach. He has also discussed an epistemology of experiment, a set of strategies that provide rational belief in experimental results. These strategies distinguish between a valid experimental result and an artifact created by the experimental apparatus. More recently he has worked on the fallibility and corrigibility of experimental results and the resolution of discordant results. He has also completed studies of the interaction of theory and experiment in the development of the theory of weak interactions from Fermi to V-A, a history of atomic parity violation experiments and their relation to the Weinberg- Salam unified theory of electroweak interactions. He has also worked on the history of the "Fifth Force" in gravity and a review of the history of the proposed 17-keV neutrino. He has written a history of the neutrino, from its proposal in 1931 to the present and his most recent book *Selectivity and Discord: Two Problems of Experiment* deals with the issues of experimenter bias and of the resolution of discordant experimental results. His most recent work, "Ending the Mendel-Fisher Controversy," is on the history of genetics.

Montag, 24.10.2011
18 c.t. Uhr
HS 04 (F.10.01)

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EINLADUNG ZUM KOLLOQUIUM

Dr. Jeroen van Dongen

(Universität Utrecht)

Rewriting the history of the light quantum: the Einstein-Rupp experiments

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Abstract

In 1926 Albert Einstein proposed two new experiments to test the wave versus particle nature of light. They were supposed to be executed by Emil Rupp, an up and coming experimental physicist from Heidelberg. Rupp confirmed Einstein's intuitions, yet was later charged with having made up his data; in fact, Rupp became one of the most famous cases of scientific fraud in the early twentieth century. Nevertheless, he appears to have been written out of the standard history of quantum mechanics. We will discuss the Einstein-Rupp experiments, their role in the history of the quantum theory, and the career of Emil Rupp. Finally, we will look at Einstein's assessment of Rupp's work in light of his changing relation to experiment.

Zur Person

Jeroen van Dongen ist „Universitair Docent" am „Institute for History and Foundations of Science" und dem Descartes Zentrum der Universität Utrecht. Seine Doktorarbeit an der Universität Amsterdam galt Einstein und seinem Streben nach einer Vereinheitlichten Feldtheorie, 2010 ist eine erweiterte Fassung der Doktorarbeit bei Cambridge University Press unter dem Titel "Einstein's Unification" erschienen. Vor dem Antritt seiner Stelle in Utrecht war Dr. van Dongen "Postdoctoral Fellow" am "Einstein Papers Project" am California Institute of Technology; er arbeitet weiter als einer der Mitherausgeber der Gesammelten Schriften Albert Einsteins.

Mittwoch, 30.11.2011
18 c.t. Uhr
Raum N.10.20

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EINLADUNG ZUM KOLLOQUIUM

Prof. Dr. Helmut Maier

(Ruhruniversität Bochum)

Chemikervereine im Nationalsozialismus: Privilegierung eines Berufstandes?

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Während des 19. Jahrhunderts gründete sich eine Vielzahl technisch-wissenschaftlicher Vereine und wissenschaftlicher Gesellschaften. Sie dienten dem disziplinären Erfahrungsaustausch und standespolitischen Interessen. Während des „Dritten Reiches“ zählte die Chemie zu den privilegierten Disziplinen. Anders als andere Standesvertretungen wurden die Chemikervereine nicht aufgelöst, sondern dem Nationalsozialistischen Bund Deutscher Technik (NSBDT) unter Fritz Todt angeschlossen. Die technisch-wissenschaftlichen Berufsgruppen erfuhren eine bis dahin nie gekannte politische Aufwertung. Der Vortrag untersucht den sukzessiven Prozess der Integration der Chemikervereine in den nationalsozialistischen Herrschaftsapparat und fragt nach den Ursachen ihrer Privilegierung.

Prof. Dr. Helmut Maier Studium der Naturwissenschafts- und Neueren Geschichte. 1990 Promotion in Naturwissenschaftsgeschichte (Dr. rer. nat.). 2007 Professur für Technik- und Umweltgeschichte, Ruhr-Universität Bochum. 2008 Vorsitzender des Bereiches Technikgeschichte, VDI Beruf und Gesellschaft

Mittwoch, 14.12.2011
18 c.t. Uhr
Raum N.10.20

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EINLADUNG ZUM KOLLOQUIUM

Prof. Dr. Ulrich Charpa

(Ruhr Universität Bochum)

Historische und systematische Aspekte einer reliabilistischen Wissenschaftsphilosophie

‚Reliabilismus' bezeichnet einen relativ jungen erkenntnistheoretischen Ansatz, der Wissen als Ergebnis eines verlässlichen Entstehungsprozesses deutet (A. Goodman, R. Nozick u.a.). Auf Wissenschaft ist diese Konzeption nur ansatzweise (Papineau, Thagard) übertragen worden. Allerdings beruhen einflussreiche Labormethodologien des 19. Jahrhunderts, wie etwa diejenigen C. Bernards und M. J. Schleidens, faktisch auf der reliabilistischen Strategie einer systematischen Ausschaltung von Irrtumsmöglichkeiten. Der Vortrag stellt die reliabilistische Behandlung von Beobachtung, Exploration und Experiment vor, verteidigt sie gegen gängige Einwände (wie den der sog. Theoriehaltigkeit) und disku-iert die heikle Einbeziehung von Theorien und methodologischen/ metaphysischen Prinzipien.

Prof. Dr. Ulrich Charpa
Research Professor at LBI London, Professor of Philosophy and Member of the Research School at Ruhr University, Bochum. Previously he taught Philosophy, History of Science and Jewish Thought at various universities. Today he is also affiliated to the Jacques Loeb Center for History and Philosophy of the Life Sciences at Ben Gurion University, Israel. He has published several books and over 100 articles in academic journals and collections, mostly on history and philosophy of science as well as the humanities. He advocates a philosophical conception of research that emphasizes the role of expert knowledge and other competencies of the scientists/scholars involved. Apart from the LBI project on Jews in German-speaking Academia, he is working on 19th century methodology and on some systematic aspects of the relationship between science and Jewish religion. Recent projects include the role of Jews in the history of philology, the historian Victor Ehrenberg and German-Jewish history of music.

Mittwoch, 11.01.2012
18 c.t. Uhr
Raum N.10.20

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EINLADUNG ZUM KOLLOQUIUM

Prof. Dr. Dirk Schlimm

(McGill University Montreal/Canada)

Pasch's philosophy of mathematics

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In his "Vorlesungen über neuere Geometrie" (1882) Moritz Pasch (1843--1930) gave the first rigorous axiomatization of projective geometry, in which he also clearly formulated the view that deductions must be independent from the meanings of the non-logical terms involved. In addition, Pasch also presented in these lectures the main tenets of his philosophy of mathematics, which underlies all his foundational works and which he continued to elaborate on throughout the rest of his life. This philosophy is quite unique in combining an empiricist epistemology with a deductivist methodology of mathematics; his conception of axiomatic systems is rooted in the material tradition, which goes back to Euclid, but it also contains crucial aspects of modern formal axiomatics, which were taken up and developed further by Hilbert. This talk presents Pasch's philosophy of mathematics and is intended as a contribution towards a better understanding of the radical transition mathematics underwent at the turn of the twentieth century."

Prof. Dr. Dirk Schlimm is an Assistant Professor in the Department of Philosophy and Associate Member in the School of Computer Science at McGill University. He received his Ph.D. from Carnegie Mellon University in 2005, and studied previously at Trinity College Dublin and Technical University of Darmstadt. His research interests fall into the areas of history and philosophy of mathematics and science, epistemology, and cognitive science. In particular, he is interested in the developments in the 19th and early 20th century that led to the emergence of modern mathematics and logic, and in systematic investigations regarding axiomatics, analogical reasoning, concept formation, the use of notation, and theory development. He is also involved in editorial projects of the works of Bernays, Hilbert, and Carnap."

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Mittwoch, 25.01.2012
18 c.t. Uhr
Raum N.10.20

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IZWT

Zeit im Umbruch:

Der Wandel des Zeitbegriffes in den Wissenschaften

Ringvorlesung WS 11/12 — Mittwoch 18–20 Uhr, vierzehntägig — Hörsaal HS 05 (G-10.07)

09. 11. 2011 Dr. Hartmut Petzold (Deutsches Museum München)
► Dimensionen und kulturelle Aspekte der Zeitmessung

23. 11. 2011 Prof. Dr. Klaus Mainzer (Technische Universität München)
► Zeitsymmetrie und Zeitpfeil: Von der physikalischen Zeit zur Lebenszeit

07. 12. 2011 Prof. Dr. Wolfgang Knöbel (Universität Göttingen)
► Die Theoretisierung sozialen Wandels und das Problem der Zeit

21. 12. 2011 Prof. Dr. Hans-Joachim Höhn (Universität Köln)
► Endlichkeit und Ewigkeit: Zeitkonzepte in der Theologie

18. 01. 2012 PD Dr. Hans-Georg Hofer (Universität Bonn)
► Zeit der Krankheiten, Krankheiten der Zeit

01. 02. 2012 Prof. Dr. Moritz Epple (Universität Frankfurt/M.)
► Bewegungen des Gegenwartpunktes, Zeitebene, Axiomatik der Zeit: Felix Hausdorffs Erkenntniskritik der Zeit

Der Begriff der Zeit gehört zu den Grundbegriffen der Wissenschaften und der durch sie immer stärker geprägten Kultur. In jüngster Vergangenheit haben die unterschiedlichsten Disziplinen neue Beiträge zum Verständnis der Zeit erarbeitet. In der Physik wird die Unumkehrbarkeit der Zeit auf die beschleunigte Expansion des Kosmos zurückgeführt, biologische Forschungen weisen die komplexe Vielfalt der natürlichen Grundlagen des menschlichen Erlebens von Zeit nach, die Psychologie zeigt die dennoch bestehende Wandlungsfähigkeit des Zeitbewußtseins, die Geschichtswissenschaft demonstriert, daß auch die wissenschaftlichen Zeitbegriffe tiefgreifender Veränderung nicht entgehen - um nur einige Beispiele zu nennen.
Zeit ist auch eine Kategorie zur Beschreibung der Verfassung von Gesellschaften und ihrer Entwicklung. Die zunehmende Beschleunigung des gesellschaftlichen Wandels, die zur Revolutionierung der sozialen Verhältnisse beiträgt, stellt auch für die Wissenschaften eine Herausforderung dar. Sie selbst sind der zunehmenden Verkürzung der Innovationszeiten, der wachsenden Flexibilisierung der Zeit und ihrer Intensivierung unterworfen. Stehen wir am Rande einer neuen Zeitauffassung?
An diese Ringvorlesung wird sich im Sommersemester 2012 eine weitere interdisziplinäre Veranstaltung zum Thema Zeit anschließen. Die Fächer Literaturwissenschaft, Geschichte und Philosophie werden in einer Vorlesungsreihe das Verhältnis von Zeit und Erzählung erörtern.

Die Vorträge finden im Rahmen des Kolloquiums Wissenschaftsgeschichte und Wissenschaftsphilosophie statt (Prof. Dr. Volker Remmert, Prof. Dr. Gregor Schiemann).
Aktuelle Informationen unter: www.izwt.uni-wuppertal.de

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EINLADUNG ZUR RINGVORLESUNG

Dr. Hartmut Petzold

(Deutsches Museum München)

Dimensionen und kulturelle Aspekte der Zeitmessung

„Worauf es dem Physiker schließlich ankommt, ist nicht, wie man Zeit definiert, sondern wie man sie misst“, erklärte der Physiker Richard Feynman 1963. Bei den zahlreichen umwälzenden naturwissenschaftlichen Erkenntnisse des zu Ende gehenden 20. Jahrhunderts spielte die Messung von kleinsten Sekundenbruchteilen ebenso eine entscheidende Rolle, wie die der Milliarden von Jahren. Zeitmessung findet heute in einem Spektrum von etwa 65 Größenordnungen statt und bereits die Feststellung, dass man die Zeit derartig vielfältig unterteilen kann, erscheint bemerkenswert. So darf sich die Beschäftigung mit dem Thema „Zeitmessung“ nicht auf die traditionellen mechanischen Uhren zur Messung von Stunden, Minuten und Sekunden beschränken - auch wenn für sie heute zu den höchstbezahlten Luxusaccessoires zählen. Nicht ganz unerwartet ist die Erkenntnis, dass die verschieden großen Zeitintervalle mit ganz unterschiedlichen Methoden und Instrumenten gemessen werden. Ungewohnt erscheint jedoch nach wie vor die Betrachtung dieser verschiedenen Instrumente und Verfahren in einem gemeinsamen Kontext. Dabei kommt auch die höchst ungleiche Verteilung der Vielfalt dieser Instrumente über das Spektrum der Zeitintervalle zur Geltung. Der unübersehbaren Zahl verschiedenster Uhren zur Messung von Stunden und Minuten, von denen viele auch noch Sekunden, Tage, Wochen, Monate und sogar Jahre anzeigen, steht eine verschwindend kleine Zahl von Instrumenten zur Messung der größeren und kleineren Zeitintervalle gegenüber. Auch wurde für die Gestaltung der traditionellen Uhren immer oft künstlerisch anspruchsvoller Aufwand getrieben, der den Blick darauf mit einer mahnenden Botschaft verknüpfte, während die naturwissenschaftlichen Messinstrumente als einheitlich gestaltete graue Kästen erscheinen. Dem entspricht auch, dass wir für die „Uhr“zeiten ein Gefühl entwickelt haben, das uns für die pauschal als extrem empfundenen größeren und kleineren Zeiten abgeht.

Dr. Hartmut Petzold: Diplom in Elektrotechnik TU Berlin; Industrietätigkeit; Promotion Geschichte an der TU Berlin; Redakteur Zeitschrift "Technikgeschichte"; 20 Jahre lang Kurator für Mathematische Instrumente, Informatik, Zeitmessung, Maß u. Gewicht am Deutschen Museum in München.

Mittwoch, 09.11.2011
18 c.t. Uhr
HS 05 (G.10.07)

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EINLADUNG ZUR RINGVORLESUNG

Prof. Dr. Klaus Mainzer

(Technische Universität München)

Zeitpfeil und Zeitsymmetrie

Von der physikalischen Zeit zur Lebenszeit

Die Zeit, die wir erleben, scheint einem ehernen Gesetz zu gehorchen: Wir werden geboren, wachsen, altern und sterben. Unsere Lebenszeit hat eine Richtung. Die heutige Kosmologie zeichnet die Entwicklung von einem heißen jungen Uruniversum zu einem expandierenden und schließlich alternden Universum. Auch in unseren Kulturen und Zivilisationen scheinen Ordnungen von Städten, Staaten und Gesellschaften zu entstehen und zu vergehen. Der Eindruck von Zeitpfeilen beschränkt sich also nicht nur auf die kosmische und biologische Evolution. Es sind Beispiele von dynamischen Systemen mit unumkehrbaren zeitlichen Entwicklungen. Demgegenüber gilt für die (meisten) Grundgesetze der Physik Zeitumkehr (Zeitsymmetrie): Die zeitliche Entwicklung ihrer dynamischen Systeme könnte auch rückwärts laufen, ohne die Gesetze zu verletzen. Man spricht dann von Invarianz (Unveränderlichkeit) der Gesetze bei Zeitumkehr (Zeitsymmetrie). Seit der Antike galt die Unveränderlichkeit und Symmetrie der Gesetze als Zeichen ihrer Ewigkeit und Hinweis auf eine göttliche Ordnung. Wie verträgt sich damit die Vernichtung von Materie in Schwarzen Löchern? Wird damit auch alle Information über unsere Existenz untergehen – im Widerspruch zu den (unitären) Gesetzen der Quantenfeldtheorie (Informationsparadoxon)? Was bleibt am Ende aller Tage? Vergisst das alternde Universum wie in einem kosmischen Alzheimer erst uns und schließlich sich selber?

Prof. Dr. Klaus Mainzer war nach einem Studium der Mathematik, Physik und Philosophie, Promotion und Habilitation in Münster Heisenbergstipendiat, 1980-1988 Professor für Philosophie und Grundlagen der exakten Wissenschaften, Dekan und Prorektor der Universität Konstanz und übernahm 1988-2008 den Lehrstuhl für Philosophie und Wissenschaftstheorie an der Universität Augsburg. Dort war er Direktor des Instituts für Philosophie und des Instituts für Interdisziplinäre Informatik. Ab 2008 hat er den Lehrstuhl für Philosophie und Wissenschaftstheorie und ist Direktor der Carl von Linde-Akademie, Mitglied des Advisory Board des Institute for Advanced Study und des Exzellenz-Forschungsclusters CoTeSys (Cognition in Technical Systems) an der Technischen Universität München. Er ist Mitglied u.a. der Academy of Europe (Academia Europaea) in London und Autor zahlreicher Bücher mit internationalen Übersetzungen.

Mittwoch, 23.11.2011
18 c.t. Uhr
HS 05 (G.10.07)

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EINLADUNG ZUR RINGVORLESUNG

Prof. Dr. Wolfgang Knöbl

(Institut für Soziologie, Göttingen)

Die Theoretisierung sozialen Wandels und das Problem der Zeit

Lange Zeit ging man in den Sozialwissenschaften davon aus, dass sich sozialer Wandel mit vergleichsweise abstrakten Prozessbegriffen wie etwa „Rationalisierung“, „Bürokratisierung“, „Individualisierung“ etc. begrifflich fassen ließe. In den 1950er und 1960er Jahren wurde diese Vorstellung mit der Formulierung der sogenannten „Modernisierungstheorie“ weiter radikalisiert, die annahm, dass Wandlungsprozesse in den hochindustrialisierten (westlichen) Ländern von den Ländern der Dritten Welt nachvollzogen, dass ‚nicht-entwickelte’ Länder ‚entwickelt’ würden. Man unterstellte also ein im Prinzip überall gleichartig und vor allem gleichmäßig ablaufenden Wandel, der allenfalls (kurzfristige) Ungleichzeitigkeiten kenne. – Tatsächlich stößt aber dieser auch heute noch höchst einflussreiche Ansatz auf erhebliche theoretische Schwierigkeiten, die sich nicht zuletzt am Phänomen einer Konzeptualisierung von Zeit festmachen lassen. Der Vortrag will diese Probleme herausarbeiten und fragen, ob überhaupt und gegebenenfalls wie sich diese lösen lassen.

Prof. Dr. Wolfgang Knöbl, derzeit Senior Fellow am Freiburg Institute for Advanced Studies (School of History) der Albert-Ludwigs-Universität Freiburg. Arbeitsschwerpunkte: Vergleichende Makrosoziologie, Politische Soziologie, Sozialtheorie und Geschichte der Soziologie.

Mittwoch, 07.12.2011
18 c.t. Uhr
HS 05 (G.10.07)

Volkert Remmert
Gregor Schiemann

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EINLADUNG ZUR RINGVORLESUNG

Prof. Dr. Hans-Joachim Höhn

(Universität zu Köln)

Endlichkeit und Ewigkeit:
Zeitkonzepte in der Theologie

Die Moderne misst den Wert menschlichen Handelns am Getanen. Je früher dessen Wert absehbar wird, umso eher ist klar, ob die die Mühe des Anfangens und die Anstrengung allen weiteren Tuns lohnt. Und je früher die Aussichtslosigkeit aller weiteren Bemühungen erwiesen ist, um so rascher ist das Aufhören angezeigt. In jedem Fall ist Tempo angesagt. Wer sich zu lange Zeit lässt mit dem Anfangen, Weitermachen und Aufhören, verliert zu viel Zeit. Eile tut Not, weil menschliches Dasein befristet ist. Darum hat die Moderne alle wissenschaftlichen, technischen und ökonomischen Daseinsoptimierungen unter einen kinetischen Imperativ gestellt hat: Alles, was den Menschen umgibt, soll immer schneller immer besser werden. Weltverbesserungen dürfen nicht allzu lange auf sich warten lassen. Denn die dem Menschen verfügbare Zeit vergeht und zerrinnt – auch die Lebenszeit der Modernisierer. Sie könnte zu Ende sein, bevor sie durch eigenes Zutun die Welt soweit verbessert haben, dass sie das Leben in und mit ihr für annehmbar halten. Darum sollte man auch mit aussichtslosen Weltverbesserungen möglichst rasch aufhören – es wäre reine Zeitverschwendung.

Die Frage nach dem Anfangen und Aufhören markiert auch den Kernbereich einer Theologie der Zeit, genauer: ihrer Disziplinen Eschatologie und Ethik. Beiden ist gemeinsam, dass sie unter spezifischen Ungewissheitsbedingungen agieren. Der Ethik geht es um die Verantwortbarkeit von Handlungen, deren Wirkungen hinsichtlich des Erreichens eines gewollten Gutes ungewiss sind. Darf man etwas anfangen, von dem man nicht weiß, wie es aufhört? Die Eschatologie ist zentriert um die Frage, ob menschliches Leben bleibend gelingen kann und ob eine gescheiterte Existenz unabwendbar ein verfehltes Leben bleibt. Ist ein Leben annehmbar, das mit dem Tod aufhört? Gibt es ein Ende, das nicht Abbruch, sondern Vollendung bedeutet? Ist eine solche Hoffnung der Vernunft zumutbar? Was die Vernunft gewinnt, wenn sie sich auf theologische Perspektiven auf das fragliche „guten Ende“ eines befristeten Daseins einlässt, ist die Leitfrage des Vortrages.

Prof. Dr. Hans-Joachim Höhn: Studium der Philosophie und Katholischen Theologie in Frankfurt, Rom und Freiburg/Br.; Promotion 1984 (Universität Freiburg), Habilitation 1989 (Universität Bonn); seit 1991 o. Professor für Systematische Theologie und Religionsphilosophie an der Universität zu Köln; Mitglied im Zentrum für Moderneforschung (ZfMod) der Universität zu Köln sowie im Vorstand des Forschungsinstitutes für Philosophie in Hannover.

Mittwoch, 21.12.2011
18 c.t. Uhr
HS 05 (G.10.07)

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EINLADUNG ZUR RINGVORLESUNG

PD Dr. Hans-Georg Hofer

(Medizinhistorisches Institut, Universität Bonn)

Zeit der Krankheiten, Krankheiten der Zeit

Zeit und Krankheit – dieses Verhältnis ist in der Geschichte der Medizin immer wieder aufgeworfen und auf vielfältige Art und Weise verhandelt worden. In meinem Vortrag möchte ich dies an zwei Beispielen verdeutlichen. Zum einen soll mit Blick auf die vormoderne Medizin nach der Bedeutung von numerischen und biologischen Zeitvorstellungen für die Konzeptualisierung von Krankheiten gefragt werden (Periodizität, Wechseljahre). Zum anderen wird auf die in der Medizin seit dem ausgehenden 19. Jahrhundert zu beobachtende Tendenz, moderne Lebenswelten unter Pathologieverdacht zu stellen, eingegangen. Der ursprünglich von Nervenärzten in Umlauf gesetzte Begriff von der „Zeitkrankheit“ Neurasthenie wurde hierbei zum Ausgangspunkt einer fortwährenden – und bis heute andauernden – Debatte über „Zeit“ als krankmachendes Agens.

Priv.-Doz. Dr. phil. Hans-Georg Hofer, ist Wissenschaftlicher Mitarbeiter am Medizinhistorischen Institut der Universität Bonn und war zuvor in gleicher Funktion an der Universität Freiburg/Br. tätig. Promotion in Geschichte an der Universität Graz mit einer Arbeit über die österreichische Psychiatrie im Umfeld des Ersten Weltkriegs. Fellowships in Wien (IFK), Manchester (CHSTM) und Durham (CHMD). 2010 Habilitation für Medizin- und Wissenschaftsgeschichte an der Universität Bonn. Forschungsprojekte und daraus hervorgehende Publikationen zur Medizin im Nationalsozialismus, zur Geschichte der medizinischen Alternsforschung sowie zur Zeitgeschichte der Medizin nach 1945.

Mittwoch, 18.01.2012
18 c.t. Uhr
HS 05 (G.10.07)

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EINLADUNG ZUR RINGVORLESUNG

Prof. Dr. Moritz Epple

(Goethe-Universität, FFM)

Bewegungen des Gegenwartpunktes, Zeitebene, Axiomatik der Zeit:

Felix Hausdorffs Erkenntniskritik der Zeit

Im letzten Drittel des 19. Jahrhunderts entfaltete sich in Naturwissenschaften und Philosophie eine komplexe Debatte zum Begriff der Zeit. Felix Hausdorff nahm in diesem Feld eine prägnante, radikal metaphysikkritische Position ein, die u.a. mit dem systematischen Durchspielen alternativer Zeitkonzepte und einer mathematischen Analyse des wissenschaftlichen Zeitbegriffs verbunden war. Der Vortrag stellt Hausdorffs Position vor und ordnet sie in das Feld der zeitgenössischen Debatten ein.

Prof. Dr. Moritz Epple: Studium der Physik, Mathematik und Philosophie an der Universität Tübingen. Studienaufenthalte in København und London. Studienabschluss im Jahr 1987 (Physik-Diplom, Staatsexamen Philosophie und Physik). Promotion in mathematischer Physik im Jahr 1991. Habilitation im Fach Geschichte der Mathematik und der Naturwissenschaften im Jahr 1998. Forschungsaufenthalte in Bonn (Mathematisches Institut), Cambridge, Mass. (Dibner Institute for the History of Science and Technology, MIT) und Berlin (Forschungsprogramm "Geschichte der Kaiser-Wilhelm-Gesellschaft im Nationalsozialismus" der Max-Planck-Gesellschaft). Von 2000 bis 2002 Heisenberg-Stipendiat der Deutschen Forschungsgemeinschaft. Ruf an die Universität Stuttgart (Historisches Institut, Abteilung für Geschichte der Naturwissenschaften und Technik) im Jahr 2001. Seit Oktober 2003 Leiter der Arbeitsgruppe Wissenschaftsgeschichte am Historischen Seminar der Goethe-Universität.

Mittwoch, 01.02.2012
18 c.t. Uhr
HS 05 (G.10.07)

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Tagungen & Workshops

Übersicht

26.-28. Januar 2012,
„Modelling at the LHC“, Simon Friedric

03. Februar 2012, „3. Rheinisch-Westfälisch Seminar“
Mechthild Köhler (AG Didaktik der Mathematik, BUW)

Dienstag, 14. Februar 2012, S.10.15, Ruhr-Wupper-Forum:
Doktorandenkolloquium Wissenschafts- und Technikgeschichte

Es folgen die zugehörigen Programme.

3. Rheinisch-Westfälisches Seminar zur Geschichte und Philosophie der Mathematik

Bergische Universität Wuppertal, Arbeitsgruppe Didaktik und Geschichte der Mathematik
Campus Grifflenberg, Gaußstraße 20, Gebäude F Ebene 12

03. Februar 2012

Programm:

10:00 - 10:30	Begrüßungskaffee
10:30 - 11:30	Mechthild Köhler (Wuppertal) **Julius Plückers „Neue Geometrie des Raumes“**
11:30 - 11:45	Kaffeepause
11:45 - 12:45	Gabriele Wickel (Siegen) **Praktische und theoretische Geometrie in einem Vermessungslehrbuch aus dem 17. Jahrhundert – Annäherung an ein schwieriges Verhältnis**
12:45 - 14:15	Mittagessen
14:15 - 15:15	Martina Schneider (Mainz) **Wie Grenzen verschwimmen – die Gruppentheorie in der Quantenmechanik**
15:15 - 15:30	Kaffeepause
15:30 - 16:30	Anna-Sophie Heinemann (Paderborn) **William Stanley Jevons' Logisches Piano: ein mechanisches Modell des Denkens?**
ab 16:30	Abschlussdiskussion
abends	Nachsitzung

Alle Vorträge finden in Raum F.12.11 statt.

Interessenten sind herzlich eingeladen. Es wird um Anmeldung bei Mechthild Köhler (koehler@math.uni-wuppertal.de) bis zum 27.01.2012 gebeten.

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~ RUHR ~ WUPPER ~ FORUM ~

Doktorandenkolloquium Wissenschafts- und Technikgeschichte

Dienstag, 14. Februar 2012, S.10.15

10 -12 Uhr

DAGMAR MROZIK	Mathematik und Jesuiten (16.-18. Jh.)
IRINA SCHMIEDEL	Botanik und Repräsentation (17.-18. Jh.)
CARSTEN TROJAN	Carl Ludwig Althans (1788-1864), Montanwesen
LARS BÜTTNER	Emil Mewes (1885-1949), Architekt
MARION KAISER	Lahnmarmor (18.-19. Jh.)

14-16 Uhr

VANESSA CIRKEL-BARTELT	Wissen über die (Um-)Welt. Ein kurzer Werkstattbericht
KLAUS SCHREURS	Kraftfahrtforschung (20. Jh.)
PHILIPP KRANZ	Prosopographie der Mathematiker (1920-1960)
ANNA THORN	Eugenik und ihre Popularisierung (USA, 20. Jh.)
ARIANNA BORRELLI	Wissensproduktion in der heutigen Teilchenphysik

Prof. Dr. Helmut Maier
Ruhr-Universität Bochum, Technik- und Umweltgeschichte
Prof. Dr. Volker Remmert
Bergische Universität Wuppertal, Wissenschafts- und Technikgeschichte

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Sommersemester 2012

01.04.2012 - 30.09.2012

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KOLLOQUIUM WISSENSCHAFTSTHEORIE UND WISSENSCHAFTSGESCHICHTE

Termine im SS 2012

Mi. 18 c.t. - Raum N.10.20

18.04.2012	Dr. Florian Schmaltz Frankfurt	*Luftfahrtforschung unter nationalsozialistischer Besatzung im Zweiten Weltkrieg zwischen Kollaboration und Widerstand*
25.04.2012 ***Fällt leider aus!***	Dr. Erik Curiel London, Western Ontario	*On the Role of Energy Conditions in Spacetime Theories* ***Fällt leider aus!***
02.05.2012	Prof. Dr. Thomas Heinze Wuppertal	*Varieties of scientific growth following the development of new instrumentation and the discovery of new matter*
09.05.2012	Dr. Michael Korey Dresden	*Geometrie und Dynastie. Mathematische Instrumente zur Freude des Fürsten und zum Wohl des Landes*
DIENSTAG 15.05.2012 **N.10.18**	Prof. Dr. Carsten Reinhardt Bielefeld	*Wissensgesellschaft. Historisierungen und Konzepte*
06.06.2012	Dr. Wolfgang Pietsch München	*Zwei Probleme der Induktion*
MONTAG 11.06.2012 **O.11.40**	Prof. Dr. Lambert Wiesing Jena	*Phänomenologie und Philosophie der Wahrnehmung*
20.06.2012	Dr. Monika Wulz Braunschweig	*Die Thermodynamik der Gesellschaft. Zum Transfer naturwissenschaftlicher Methoden in Soziologie und Geschichte*
DIENSTAG 26.06.2012 **N.10.18**	Dr. Sabina Brevaglieri Mainz	*Rom, Stadt der Wissenschaft: Wissensräume, Zusammenspiele, Zirkulationen im Zentrum der Katholischen Welt (1600-1630)*
27.06.2012	Prof. Dr. Ulrich Gähde Hamburg	*Theorienabhängige Bestimmung von Basismengen*
04.07.2012	M.A. Susann Wagenknecht Aarhus	*The Division of Epistemic Labour in Research Teams*
11.07.2012 **G.11.01**	Prof. Dr. Johannes Grebe-Ellis	*Die Verallgemeinerung von Newtons experimentum crucis aus der Perspektive Goethes*

Prof. Dr. Volker Remmert
Prof. Dr. Gregor Schiemann

Weitere Informationen lesen sie bitte unter: www.izwt.uni-wuppertal.de

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EINLADUNG ZUM KOLLOQUIUM

Dr. Florian Schmaltz

(Frankfurt/Main)

Luftfahrtforschung unter nationalsozialistischer Besatzung im Zweiten Weltkrieg zwischen Kollaboration und Widerstand

.

Institutioneller Ausgangspunkt des Vortrags bildet die Aerodynamische Versuchsanstalt (AVA) Göttingen, einem der weltweit führenden Forschungszentren der modernen Aerodynamik, die sich Anfang des 20. Jahrhunderts aus der Physik, Mathematik und den Ingenieurwissenschaften zu einem interdisziplinären, hybriden Forschungsgebiet herausbildete. Im Nationalsozialismus expandierte die AVA zur Großforschungseinrichtung und erhielt seit 1940 im annektierten Österreich, in Frankreich, den Niederlanden, Lettland, dem „Protektorat Böhmen und Mähren“, Norwegen und der Ukraine sogenannte Außenstellen in dort bestehenden Großforschungseinrichtungen und ad hoc etablierten Forschungsstellen. In welchem Umfang gelang es dem NS-Regime, für die deutsche Kriegsforschung Ressourcen in seinem europäischen Herrschaftsbereich zu mobilisieren? Am Beispiel der aerodynamischen Forschung, einer Schlüsseldisziplin für die hochtechnologische Luftkriegsführung des 20. Jahrhunderts, soll die noch kaum untersuchte Geschichte der Wissenschaften unter den Bedingungen der NS-Okkupationspolitik analysiert werden und in komparativer Perspektive Gemeinsamkeiten und Unterschiede der Wissenschaftsentwicklung im okkupierten Ost- und Westeuropa herausgearbeitet werden.

Zur Person

Dr. Florian Schmaltz studierte Sozial- und Wirtschaftsgeschichte, Geschichte, Philosophie und Neuere deutsche Literaturwissenschaften in Hamburg und an der FU Berlin. 2000 - 2004 war er Doktorand im Forschungsprogramm der Präsidentenkommission der Max-Planck-Gesellschaft „Geschichte der Kaiser-Wilhelm-Gesellschaft im Nationalsozialismus", anschließend wissenschaftlicher Mitarbeiter im DFG-Projekt: "Forschungshybride: Aero-dynamische Forschungspraxis im Ersten und Zweiten Weltkrieg zwischen Politik, Rüstung und wissenschaftlicher Theoriebildung" am Historischen Seminar der Johann Wolfgang Goethe-Universität Frankfurt am Main in der Arbeitsgruppe Wissenschaftsgeschichte.

Mittwoch, 18.04.2012
18 c.t. Uhr
Raum N.10.20

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EINLADUNG ZUM KOLLOQUIUM

Prof. Dr. Thomas Heinze

(Wuppertal)

Varieties of scientific growth following the development of new instrumentation and the discovery of new matter

(Es wird in Deutsch vorgetragen)

.

This talk describes patterns of scientific growth that emerge in response to major research accomplishments. Using two Nobel-Prize winning contributions, the development of instrumentation (Scanning Tunneling Microscope, STM) and the discovery of new matter (Buckminsterfullerenes, BUF), we examine the growth of follow-up research via citation networks at the author and subdiscipline level. A longitudinal network analysis suggests that structure, cohesiveness, and interdisciplinarity vary considerably with the type of breakthrough and over time. Our results show that scientific progress is multifaceted, including not only theoretical advances but also the discovery of new instrumentation and new matter. In addition, we argue that despite conventional wisdom, scientific growth does not necessarily lead to the formation of new specialties or new subdisciplines. Rather, we observe the emergence of a research community that incorporates both considerable communications across disciplinary boundaries and low mutual integration.

Nach Studium der Soziologie und Volkswirtschaftslehre in Trier und Stirling (Diplom 2000), arbeitete Thomas Heinze als wiss. MA und später als Projektleiter am Fraunhofer-Institut für System- und Innovationsforschung in Karlsruhe (2001-2007), absolvierte gleichzeitig ein Postgraduiertenstudium an der Hochschule für Verwaltungswissenschaften in Speyer und promovierte dort bei Dorothea Jansen zu einer organisations- und wissenschaftssoziologischen Analyse der Nanotechnologie (Promotion 2005). Danach war er Postdoktorand an der Universität Twente in den Niederlanden (2007-2008). Anschließend wechselte er an die Universität Bamberg, wo er als akademischer Rat am Lehrstuhl von Richard Münch tätig war und dort auch habilitiert wurde (Habilitation 2010). Die kumulative Habilitationsschrift trägt den Titel: "Institutionelle Bedingungen für ein leistungsfähiges Wissenschaftssystem". Seit April 2011 ist TH Professor für Soziologie, insbesondere Organisationssoziologie an der BUW.

Mittwoch, 02.05.2012
18 c.t. Uhr

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EINLADUNG ZUM KOLLOQUIUM

Dr. Michael Korey
(Dresden)

Geometrie und Dynastie.
Mathematische Instrumente zur Freude des Fürsten und zum Wohl des Landes

.

Mehr Geometrie wagen". Was zunächst eine Variation der Worte Willy Brandts zu sein scheint, wurde tatsächlich vor mehr als 400 Jahren als Ratschlag eines hohen Beamten an seinen sächsischen Landesfürsten gegeben. In diesem Vortrag gibt der Konservator des Mathematisch-Physikalischen Salons im Dresdner Zwinger einen Einblick in die Welt der mathematischen Instrumente einer früheren Epoche. In der Tat war die Mathematik an manchen Fürstenhöfen der Frühen Neuzeit eine staatstragende Disziplin. Die Beschäftigung mit mathematischen Themen und Instrumenten konnte aber nicht nur offensichtlich "nützlichen" Zwecken wie der Vermessung eines Territoriums oder dem Management von Geheimnissen, sondern auch dem Wissensdurst und repräsentativen Selbstverständnis der Herrscher dienen. Was heute vielleicht besonders überrascht: Mathematik galt damals nicht selten auch als "Lutz" oder "Ergötzung".Die Zuhörer sind also eingeladen, in einen historischen "Lustgarten" der Mathematik einzutreten.

Michael Korey studied in mathematics (with minors in physics, philosophy, and classics) at Princeton, Cambridge (UK), and the University of Chicago, where he received his Ph.D. within the field of mathematical analysis. He came to Berlin in 1994 to take up a postdoctoral fellowship from the Max Planck Society as part of its Research Group on Partial Differential Equations and Harmonic Analysis. From 1997-2002 he was Wissenschaftlicher Assistent (assistant professor) at the University of Potsdam (Germany). In 2002 Korey moved to Dresden to become curator of the collections of mathematical and philosophical instruments at the Mathematisch-Physikalischer Salon of the Staatliche Kunstsammlungen Dresden. In 2007 Korey curated the exhibition ‘The Geometry of Power: The Power of Geometry’ in the Palace of Dresden, producing a book of the same name. In 2008 he co-organized the international conference ‘Fortification in Focus,’ which won a prize from the German federal ministry of science and research for its linkage of mathematics and the humanities. In 2010 he curated the exhibition ‘Fragments of Memory: The Temple of Solomon in the Dresden Zwinger. Facets of a Baroque Architectural Model and an Early Jewish Museum.’ He has also been an instructor in the mathematics faculty of the Technical University in Dresden and is currently teaching at the Hochschule für Technik und Wirtschaft in Dresden. His writings and research span a range of topics, from optical instruments in the early Kunstkammer to Biblical and mathematical metaphors of knowledge in the Enlightenment era.

Mittwoch, 09.05.2012
18 c.t. Uhr
Raum N.10.20

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EINLADUNG ZUM KOLLOQUIUM

Prof. Dr. Carsten Reinhardt

(Bielefeld)

Wissensgesellschaft

Historisierungen und Konzepte

Wissensgesellschaft ist zu einer beliebten analytischen Kategorie moderner Gesellschaft geworden, die zunehmend auch für historische Konzeptualisierungen verwendet wird. Mein Vortrag wird Zugänge vorschlagen, die zum einen die Verbundenheit des Begriffs mit den 1960er und 1970er Jahren beachten, zum anderen eine Nutzbarmachung des Konzepts der Wissenschaftsgesellschaft für eine Geschichte der Moderne ermöglichen

Carsten Reinhardt ist Professor für Historische Wissenschaftsforschung am Institut für Wissenschafts- und Technikforschung der Universität Bielefeld. Seine Arbeitsgebiete liegen in der Geschichte der Naturwissenschaften im 19. und 20. Jhdt, v.a. der Geschichte der Industrieforschung, der Expertise und wissenschaftlicher Methoden.

Dienstag, 15.05.2012
18 c.t. Uhr
Raum N.10.18

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EINLADUNG ZUM KOLLOQUIUM

Dr. Wolfgang Pietsch

(München)

Zwei Probleme der Induktion

.

Aus der Wissenschaftsgeschichte sind zwei inferentielle Methoden bekannt, um auf Grundlage einer endlichen Anzahl von Beobachtungen deter-ministische allgemeine Gesetzmäßigkeiten aufzustellen, nämlich enumerative Induktion sowie eliminative Induktion in der Tradition von Francis Bacon und John Stuart Mill. Mit Bezug auf ältere Arbeiten von Georg Henrik von Wright formuliere ich für beide Fälle ein Induktionsproblem, das heißt ich untersuche, unter welchen zusätzlichen Annahmen die entsprechenden Schlüsse verlässlich werden. Im Ergebnis unterscheidet sich das Problem der eliminativen Induktion grundlegend vom Problem der enumerativen Induktion, also von Humes klassischem In-duktionsproblem. Bemerkenswert ist unter anderem, dass eliminative Induktion eine wenn auch abgeschwächte Variante des viel geschmähten Kausalprinzips voraussetzt.

Dr. Pietsch ist wissenschaftlicher Mitarbeiter an der TU München und an der Carl von Linde Akademie. Nach einem Diplom in Physik an der Humboldt Universität Berlin hatte Dr. Pietsch an der Universität Augsburg in Philosophie promoviert; sein Doktorarbeitsthema war "Der Zeitpfeil - philosophische und physikalische Grundlagen". Seine Arbeiten beschäftigen sich sowohl mit klassischen Themen der allgemeinen Wissenschaftsphilosophie als auch mit Themen der Philosophie der Physik im engeren Sinne; im Moment beschäftigt er sich vor allem mit Induktion, Unterbestimmtheit und den philosophischen Grundlagen der Elektrodynamik.

Mittwoch, 06.06.2012
18 c.t. Uhr
Raum N.10.20

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FB A

Philosophisches Colloquium

EINLADUNG ZUM KOLLOQUIUM

Prof. Dr. Lambert Wiesing

(Jena)

Phänomenologie und Philosophie der Wahrnehmung

Traditioneller Weise interessiert sich die Philosophie für das Ich der Wahrnehmung, weil dieses Ich die Wahrnehmung hervorbringt; durch seine Leistungen soll die Entstehung von Wahrnehmung erklärt werden. Doch wenn sich diese Erklärungen und Modelle über die subjektiven Bedingungen der Möglichkeit von Wahrnehmung als Mythen entlarven, scheint ein dezidiert phänomenologisches Projekt notwendig zu werden, das über die umgekehrte Abhängigkeit nachdenkt. Genau das ist das Thema des Vortrages: Es soll gezeigt werden, daß die Phänomenologie sich innerhalb der Philosophie der Wahrnehmung durch eine spezifische Fragestellung auszeichnet. Nicht das Ich, welches die Wahrnehmung hervorbringt, gilt es zu thematisieren, wenn die Philosophie der Wahrnehmung an die eigenen Erfahrungen gebunden sein soll, sondern die Wahrnehmung, die mich hervorbringt, die mich in der Welt sein läßt. So sinnvoll die skeptische Haltung gegenüber den gegenwärtig dominanten Strömungen der Philosophie der Wahrnehmung auch ist, sie braucht nicht das letzte Wort zu haben: Wer wahrnimmt, weiß, wie es ist, ein Wahrnehmender zu sein. Dieses besondere, unzweifelhafte Wissen des Menschen um seine eigene Lage ist das Thema einer Phänomenologie der Wahrnehmung, die um der sicheren Erkenntnis willen auf jede Art der Unterstellung und Modellbildung zu verzichten versucht.

Prof. Dr. phil. Lambert Wiesing, Lehrstuhl für Bildtheorie und Phänomenologie an der Friedrich Schiller Universität Jena.

Montag, 11.06.2012, 18 c.t. Uhr
Raum O.11.40

Gemeinsame Veranstaltung des Philosophischen Colloquiums und des Kolloquiums für Wissenschaftsgeschichte und -philosophie des IZWT

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EINLADUNG ZUM KOLLOQUIUM

Dr. Monika Wulz

(Braunschweig)

Die Thermodynamik der Gesellschaft. Zum Transfer naturwissenschaftlicher Methoden in Soziologie und Geschichte

.

Edgar Zilsel (1891-1944) ist vor allem für seine wissenschaftshistorischen Arbeiten zu den soziologischen Bedingungen der Entwicklung der modernen Naturwissenschaft in der Renaissance bekannt. Gleichzeitig rezipierte Zilsel aber auch die zeitgenössischen Entwicklungen in der physikalischen, geophysikalischen und astronomischen Forschung sowie in den Lebenswissenschaften und setzte diese in Bezug zu den Geschichtswissenschaften und zur Soziologie. Der Vortrag wird diesen Transfer von naturwissenschaftlichen Modellen in historisch-soziologische Methoden behandeln und damit nach der gemeinsamen Konzeption einer physikalischen, biologischen und soziologischen Zeitlichkeit fragen, welche Zilsel seinen historiographischen wie auch seinen politischen Überlegungen zugrunde legte.

Dr. Monika Wulz, wissenschaftliche Mitarbeiterin am Seminar für Philosophie der Technischen Universität Braunschweig; 2008-2010 Postdoktorandin am Max-Planck-Institut für Wissenschaftsgeschichte in Berlin; 2011 Research Fellow am Internationalen Forschungszentrum Kulturwissenschaften in Wien; Forschungsschwerpunkte: Wissenschaftsphilosophie in Frankreich und Österreich um 1930; Schnittstellen von Wissenschaftstheorie, Wissenschaftsgeschichte und politischer Theorie.

Mittwoch, 20.06.2012
18 c.t. Uhr
Raum N.10.20

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EINLADUNG ZUM KOLLOQUIUM

Dr. Sabina Brevaglieri

(Mainz)

Rom, Stadt der Wissenschaft:

Wissensräume, Zusammenspiele, Zirkulationen im Zentrum der Katholischen Welt (1600-1630)

.

Dienstag, 26.06.2012
18 c.t. Uhr
Raum N.10.18

Volker Remmert
Gregor Schiemann

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BERGISCHE UNIVERSITÄT WUPPERTAL

IZWT

EINLADUNG ZUM KOLLOQUIUM

Prof. Dr. Ulrich Gähde

(Hamburg)

Theorienabhängige Bestimmung von Basismengen

.

„In zahlreichen wissenschaftstheoretischen Ansätzen spielt die Unterscheidung zwischen theoretischen Termen und Beobachtungstermen eine zentrale Rolle. Im strukturalistischen Theorienkonzept tritt an ihre Stelle eine Unterscheidung zwischen theoretischen und nichttheoretischen Termen, die jeweils auf eine spezielle empirische Theorie relativiert wird. Dabei wird diese Unterscheidung primär auf Relationen bzw. Funktionen bezogen. Dagegen werden die Basismengen, auf denen diese Relationen definiert sind, als unproblematisch betrachtet und wie selbstverständlich den nichttheoretischen Termen zugeschlagen. Im Vortrag werden an Hand von Beispielen Fälle diskutiert, bei denen Elemente dieser Basismengen selbst in theorieabhängiger Weise bestimmt werden. Es wird dargestellt, dass sich daraus zahlreiche grundlegende Probleme für das strukturalistische Theorienkonzept ergeben.“

Prof. Dr. Gähde hat nach einem Diplom in theoretischer Physik bei Wolfgang Stegmüller an der LMU München in Philosophie promoviert und sich später in Bielefeld habilitiert. Nach einem Heisenberg Stipendium war er 6 Jahre in Bayreuth Professor für Philosophie und ist schliesslich 1999 zum Professor für Philosophie nach Hamburg berufen worden. Sein Hauptarbeitsgebiet ist das strukturalistische Programm innerhalb der Wissenschaftsphilosophie, das er in den vergangenen Jahren neben der Astrophysik auch auf ethische Theorien angewandt hat. Diese Arbeit hat in einem intensives Interesse an den Gemeinsamkeiten und Unterschieden zwischen deskriptiven und ethischen Theorien ihren Ursprung.

Mittwoch, 27.06.2012
18 c.t. Uhr
Raum N.10.20

BERGISCHE UNIVERSITÄT WUPPERTAL

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Gregor Schiemann

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EINLADUNG ZUM KOLLOQUIUM

Susann Wagenknecht

(Aarhus)

The Division of Epistemic Labour in Research Teams

.

If we do not achieve a thorough understanding of the collaborative relationships in groups, the epistemic nature of multi-authored research will remain obscure. Based on ongoing empirical work, I will provide an analysis of the division of epistemic labour in two exemplary research teams and point out implications of this analysis for Philosophy of Science. The division of labour is an object of study with a long history in sociology since Durkheim (1964). The division of epistemic labour in research has recently moved into the focus of Social Epistemology (e.g. Goldberg 2011). Kitcher (1993) and e.g. Goldman (2002: 245ff.) have discussed the division of labor in the scientific community in terms of risk spreading by the establishment of independent research groups. The character of within-group collaboration in scientific practice, however, has not yet been elucidated sufficiently. Groups differ fundamentally from peer communities. On group level, division of labor creates strong, immediate inter-dependence between single scientists. In my talk, I will show that the two groups studied show distinct patterns of dividing and integrating epistemic labour which I will label 'syntagmatic' and 'paradigmatic'. This distinction, then, constitutes a springboard for an outlook on the manifold nature of collaborative knowledge creation and the status of individual knowing with which I will close my talk.

Susann Wagenknecht is currently a Ph.D. fellow at the Centre for Science Studies (CSS, Aarhus University). Previously, she graduated from the MA program in History, Philosophy and Sociology of Science at the Institut für Wissenschafts- und Technikforschung (IWT, Bielefeld University). Working at the intersection of Social Epistemology and Philosophy of Science, she studies the collaborative knowledge production in research groups whereby she draws on fieldwork and interviews.

Mittwoch, 04.07.2012
18 c.t. Uhr
Raum N.10.20

Volker Remmert
Gregor Schiemann

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BERGISCHE UNIVERSITÄT WUPPERTAL

IZWT

EINLADUNG ZUM KOLLOQUIUM

Prof. Dr. Johannes Grebe-Ellis

(Wuppertal)

Die Verallgemeinerung von Newtons *experimentum crucis* aus der Perspektive Goethes

(Experimentalvortrag)

.

Newton konnte zeigen, dass weißes Licht in verschieden farbige Lichter zerlegt und aus einer Überlagerung dieser Farben erzeugt werden kann. Seine Experimente und die daraus entwickelte Lichttheorie gehören zu den bedeutendsten Errungenschaften der physikalischen Optik. Dies hat bekanntermaßen Goethe nicht davon abgehalten, in seiner „Farbenlehre“ heftig gegen Newtons Argumentation zu polemisieren und sie als einseitig zu bezeichnen. Der *casus* Goethe *contra* Newton hat seither viele Gemüter erregt. Aus physikalischer Sicht ist der Fall erledigt. – Neuere historische und wissenschaftstheoretische Forschungen entdecken indessen Goethes Idee der *Invertierung* neu und fragen nach der physikalischen Umsetzbarkeit dieser Idee im Sinne einer symmetrischen Erweiterung der Experimente Newtons mit den Mitteln der modernen Optik. Ihre Zuspitzung erfährt diese Frage in dem Problem, das zentrale Experiment der Optik Newtons, sein *experimentum crucis*, konsequent zu invertieren und damit den Nachweis auf spektrale Reinheit auch für die Farben des „umgekehrten Spektrums“ zu erbringen.

Im Vortrag werden einige der Experimente Newtons nachvollzogen, es wird Goethes Idee der Invertierung vorgestellt und gezeigt, unter welchen Bedingungen seine These von der Gleichwertigkeit von Licht und Finsternis für die Farbentstehung in Newtons Experimente technisch implementiert werden kann. Die so verallgemeinerten Experimente Newtons stellen eine Synthese von Newtons und Goethes Leistungen dar. Sie wurden 2008 erstmals durchgeführt und zeigen, dass die Finsternis optisch in farbige Schatten zerlegt und aus diesen wiederum zusammengesetzt werden kann. Inwiefern dieses Ergebnis Goethes These von der Symmetrisierbarkeit spektraler Phänomene bestätigt und zugleich im Einklang mit der Theorie Newtons steht, kann unterschiedlich interpretiert werden und gibt Gelegenheit zur Diskussion.

Prof. Dr. Johannes Grebe-Ellis, Physik und ihre Didaktik an der Bergischen Universität Wuppertal

Mittwoch, 11.07.2012
18 c.t. Uhr
Raum G.11.01

Volker Remmert
Gregor Schiemann

www.izwt.uni-wuppertal.de

BERGISCHE UNIVERSITÄT WUPPERTAL

Tagungen & Workshops

Übersicht

Mi, 16. Mai 2012, 17 Uhr c.t., Alter Senatssaal (P.08.14), Grifflenberger Gespräche:
Das „Rätsel der einsamen Hand“. Ist das Problem der „inkongruenten Gegenstücke“ gelöst?

01.-02. Juni 2012, Alter Senatssaal (P.08.14): „Wilhelm II. - Archäologie und Politik“
Veranstalter und Ansprechpartner: Jun.-Prof. Dr. Sabine Mangold-Will (Neuere und Neueste Geschichte), Thorsten Beigel (Alte Geschichte)

Freitag, 29. Juni 2012, 15-19 Uhr: „Workshop on the History of Modern Mathematics“
Mit Vorträgen von Jeremy Gray und Christophe Eckes

02.-05. September 2012: Gemeinsame internationale Tagung „Tintenfaß und Teleskop.
Galileo Galilei im Schnittpunkt wissenschaftlicher, literarischer und visueller Kulturen im europäischen 17. Jahrhundert“ von Andrea Albrecht (Freiburg), Giovanna Cordibella (Bern) und Volker Remmert in der Villa Vigoni.

13.-15. September 2012, Berlin: Berlin Conference on Intellectual and Institutional Innovation in Science
Berlin-Brandenburg Academy of Sciences and Humanities

> We cordially invite you to „Berlin Conference on Intellectual and Institutional Innovation in Science“. The conference seeks to improve our understanding of science as an institution in advanced political economies and in global culture. While commentators agree that the governance of research has undergone substantial change, many fundamental questions implied in this transformation await systematic treatment. This conference addresses some of these questions with regard to intellectual and institutional innovation in science. First, the conference explores the capability of research organizations and research systems to produce original and transformative intellectual contributions, such as new theories, methods, instrumentation or empirical discoveries. We invite papers that discuss factors and mechanisms at the level of research organizations and the wider institutional environment that enable scientists and research groups to accomplish ground-breaking results. The second theme addresses the capability of research organizations and research systems to take up new intellectual developments and to institutionalize new fields of research.
>
> The Berlin Conference features internationally leading scholars from fields like history of science, sociology of science, research policy, and economics of science. Speakers include David Baneke (Leiden), Eva Barlösius (Hannover), Silke Beck (Leipzig), Mats Benner (Lund), Ronald Doel (Florida State), Lars Engvall (Uppsala), James Evans (Chicago), Irwin Feller (AAAS), Jochen Gläser (Berlin), Edward Hackett (Arizona State), Olof Hallonsten (Gothenburg), Grit Laudel (Twente), Roger Launius (NASA), Jacques Mairesse (Paris), James Mody (Rice), Frank van der Most (Amsterdam), Dietrich Nelle (Keynote, Geman Ministry of Research and Education), Julien Pénin (Strasbourg), Thomas Pfister (Zeppelin), Marc Rothenburg (NSF), Roger Stuewer (Minneapolis) and Richard Whitley (Manchester).

17.-19. September 2012: Gemeinsame internationale Tagung "Wissen und Gärten"
des IZWT mit dem CGL Hannover (Zentrum für Gartenkunst und Landschaftsarchitektur).

Beachten Sie auch weitere Informationen im Anhang!

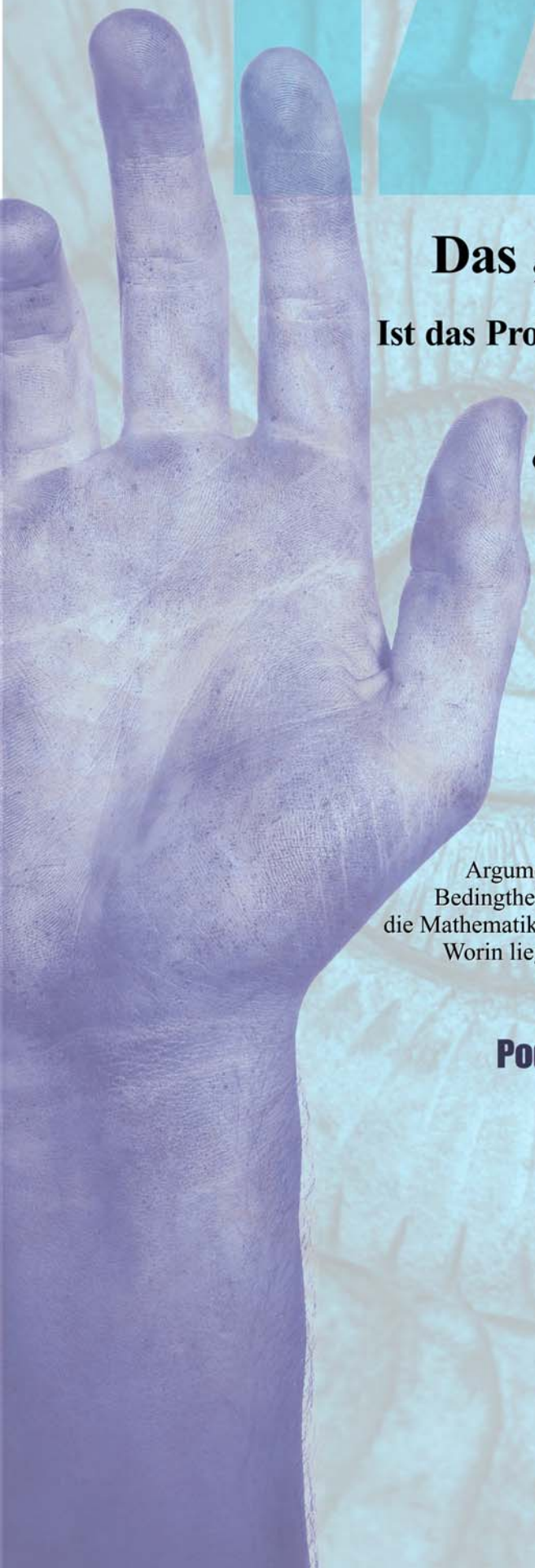
19.-21. September 2012: Welche Natur wollen wir?
Gemeinsame Interdiziplinäre Konferenz mit der Forschungsstätte der Evangelischen Studiengemeinschaft (FEST), Heidelberg.
Organisation: Prof. Dr. Gerald Hartung (BUW), Dr. Thomas Kirchhoff (FEST)

Beachten Sie auch weitere Informationen im Anhang!

Es folgen die zugehörigen Programme.

Grifflenberger Gespräche

des Interdisziplinären Zentrums für Wissenschafts- und Technikforschung (IZWT)
an der Bergischen Universität Wuppertal



Das „Rätsel der einsamen Hand“.

Ist das Problem der “inkongruenten Gegenstücke“ gelöst?

Anscheinend war es I. Kant, der das Problem der “inkongruenten Gegenstücke“ also von symmetrischen Körpern, die nicht deckungsgleich sind - in die philosophische Diskussion eingeführt hat (1768). Obwohl einfach erscheinend, hat dieses Problem immer wieder zu Kommentaren und Lösungsvorschlägen angeregt, auch jüngste Beispiele hierzu sind zahlreich. Das „Rätsel der einsamen Hand“, das Kant aufgeworfen hat, scheint seine faszinierende Wirkung nicht eingebüßt zu haben. In der Wissenschaftsgeschichte spielten inkongruenten Gegenstücke eine wichtige Rolle vor allem als Argument für die Existenz (und eventuelle Nutzbarmachung) eines vierdimensionalen Raums. Spätestens mit Gottlieb Plattners unglücklicher Reise durch die vierte Dimension hielten die inkongruenten Gegenstücke auch Einzug in die Literatur. Die Entdeckung von Symmetriebrechungen durch die moderne Physik hat die Kantischen Fragen in modifizierter Form wiederbelebt.

Zum einen stellt sich die Frage nach Ziel und Stringenz der Kantischen Argumentation, zum andern fragt es sich, ob Kants Argument nur die historische Bedingtheit seines Denkens widerspiegelt: Ist es nicht so, dass die Entwicklung, die die Mathematik nach Kant genommen hat, dessen Argumente obsolet gemacht hat? Und: Worin liegt eigentlich die Faszination dieses doch eher trocken wirkenden Rätsels?

Podiumsdiskussion mit Publikumsbeteiligung

Prof. Dr. Manfred Baum (Wuppertal)
Prof. Dr. Brigitte Falkenburg (Dortmund)
Prof. Dr. Holger Lyre (Magdeburg)
Prof. Dr. Klaus Volkert (Wuppertal)

Mittwoch 16. Mai 2012
17.00 Uhr c.t.
Alter Senatssaal P.08.14

TAGUNG

„WILHELM II. – ARCHÄOLOGIE UND POLITIK“

Bergische Universität Wuppertal
Historisches Seminar

1.-2. Juni 2012

Campus Grifflenberg
Alter Senatssaal (P.08.14)

Veranstalter und Ansprechpartner:

Thorsten Beigel
(Alte Geschichte)

beigel@uni-wuppertal.de
0202/439-3238

Jun.-Prof. Dr. Sabine Mangold-Will
(Neuere und Neueste Geschichte)

mangold@uni-wuppertal.de
0202/439-2426

Die Tagung wird unterstützt von

Fritz Thyssen Stiftung
für Wissenschaftsförderung

IZWT Interdisziplinäres Zentrum für Wissenschafts- und Technikforschung
Normative und historische Grundlagen

BERGISCHE UNIVERSITÄT WUPPERTAL

Kaum eine andere historische Person ist so gut erforscht wie der letzte deutsche Kaiser, Wilhelm II. Dennoch ist es eher unbekannt, daß Wilhelm II. nicht nur als Mäzen eine ganze Reihe archäologischer Ausgrabungen finanzierte, sondern sich auch selbst auf Korfu als Archäologe betätigte. Doch woher rührte dieses Interesse? Handelte es sich dabei – wie oft nahegelegt wird – nur um ein persönliches Hobby des Monarchen?

Die Tagung „Wilhelm II. – Archäologie und Politik" geht davon aus, daß sich auch Wilhelms Engagement zugunsten der Archäologie – einer damals noch jungen Disziplin – als Teil seiner imperialen Herrschaftsinszenierung wie -legitimierung interpretieren lässt. Die erkenntnisleitende Fragestellung richtet sich daher auf den nachweisbaren Zusammenhang zwischen Wilhelms privatem wie politischem Engagement zugunsten der Klassischen wie Vorderasiatischen Archäologie und den innen- und außenpolitischen Interessen des Deutschen Kaiserreiches.

Im Mittelpunkt der Tagung sollen dabei jene Verflechtungen von Archäologie und Politik im Wilhelminischen Kaiserreich stehen, die sich in der Person des Monarchen konzentrieren.

Neben Wilhelms eigener Grabungs- und Veröffentlichungstätigkeit auf dem Gebiet der Archäologie sollen auch Forscher, Institutionen und konkrete Grabungsprojekte behandelt werden, an denen der Kaiser besonderen Anteil nahm. Somit bewegt sich die Tagung in einem Spannungsfeld zwischen klassischer Politikgeschichte sowie Kultur- und Wissenschaftsgeschichte.

Tagungsprogramm

Freitag, 1. Juni 2012

Bis 13.00 Ankunft

13.00-13.30 Eröffnung der Tagung ***(Beigel/Mangold-Will)***

13.30-14.15 ***Dr. Charlotte Trümpler*** *(Frankfurt/M.)*
Archäologie und Politik im Wilhelminischen Zeitalter

14.15-15.00 ***Prof. Dr. Matthias Steinbach*** *(Braunschweig)*
Wilhelm II. und die Gelehrtenkultur der Weimarer Zeit

15.00-15.30 Kaffee-Pause

15.30-16.15 ***Prof. Dr. Sabine Mangold-Will*** *(Wuppertal)*
Die Orient-Reise Wilhelms II.

16.15-17.00 ***Lars Petersen M.A.*** *(Freiburg)*
Wilhelm II. und Baalbek

17.00-17.30 Kaffee-Pause

17.30-18.15 ***Thorsten Beigel*** *(Wuppertal)*
Wilhelm II. und die Gorgo

18.15-19.00 ***Dr. Olaf Matthes*** *(Hamburg)*
Die Deutsche Orient-Gesellschaft „Das Wissenschaftliche Garderegiment" des Kaisers

anschließend: gemeinsames Abendessen

Samstag, 2. Juni 2012

9.30-10.15 ***Dr. Thomas Gertzen*** *(Berlin)*
Wissenschaft im Dienste nationaler Interessen? ‚Deutsche' Ägyptologie im Kaiserreich und Ersten Weltkrieg

10.15-11.00 ***Dr. Susanne Voß*** *(Köln)*
Die Institutionalisierung deutscher wissenschaftlicher Interessen in Ägypten im wilhelminischen Imperialismus 1890-1914

11.00-11.30 Kaffee-Pause

11.30-12.15 ***Prof. Dr. Justus Cobet*** *(Essen)*
„Es ist nach meiner Überzeugung ein sehr interessanter Stoff vorhanden" – Theodor Wiegand zwischen Konstantinopel und Berlin

12.15-13.00 ***Dr. Markus Kirchhoff*** *(Leipzig)*
Juden und vorderorientalische Archäologie im Kaiserreich – Assimilierte und zionistische Perspektiven

13.00-14.00 Mittagspause

14.00-14.45 ***Prof. Dr. Suzanne Marchand*** *(Baton Rouge)*
Leo Frobenius und die Doorner Arbeitsgemeinschaft

anschließend: Abschlußdiskussion

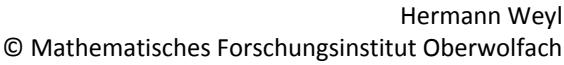
IZWT Interdisziplinäres Zentrum für Wissenschafts- und Technikforschung
Normative und historische Grundlagen

Workshop on the History of Modern Mathematics

15.00 Uhr

Christophe Eckes
(Lyon, Frankreich)

Weyl's Lecture Courses on Group Theory at Princeton


Hermann Weyl

16.30 Uhr

Jeremy Gray
(Warwick, GB)

Poincaré and Philosophy


Henri Poincaré

Musical Act: eins und eins Jazz-Duo
Sven Heinze (p), Julia Kriegsmann (as)

Freitag, 29.06.2012
HS 28 (I.13.71)

Prof. Dr. Volker Remmert
Prof. Dr. Gregor Schiemann

Weitere Informationen unter: www.izwt.uni-wuppertal.de

BERGISCHE UNIVERSITÄT WUPPERTAL

Villa Vigoni

CENTRO ITALO-TEDESCO
DEUTSCH-ITALIENISCHES ZENTRUM

Tagung: TINTENFASS UND TELESKOP.
Galileo Galilei im Schnittpunkt wissenschaftlicher, literarischer und visueller Kulturen im europäischen 17. Jahrhundert

Andrea Albrecht (Stuttgart), Giovanna Cordibella (Bern), Volker Remmert (Wuppertal)

PROGRAMM

MONTAG, 3. SEPT. 2012

I. Sektion: Galileo und die literarische Kultur des 17. Jahrhunderts
Moderation: Giovanna Cordibella

9.00 John L. Heilbron (Berkeley): Galileo as Playwright
9.45 Henning Hufnagel (Freiburg): Der unmögliche Dialog. Bruno und Galilei, Kopernikaner und Dialogautoren

10.30 *Coffeebreak*

11.00 Erminia Ardissino (Turin): Galileo, scrittore della luce
11.45 Francesco Sberlati (Bologna): Lo scienziato savio. Galileo di fronte ai letterati

13.00 *Pranzo / Mittagessen*

15.00 Olav Krämer (Freiburg): Galileo als Symbol in John Miltons *Areopagitica* und *Paradise Lost*

15.45 *Coffeebreak*

II. Sektion/Teil 1: Galilei in der Wissenschaftsgeschichte, der Kultur- und Wissensgeschichte
Moderation: Andrea Albrecht

16.30 Eileen Reeves (Princeton): Something of a Cypher: Galileo's Anagrams
17.15 Michele Camerota (Cagliari): Galileo e Giovan Battista Strozzi il giovane: dall'Accademia degli Alterati a quella degli Ordinati

DIENSTAG, 4. SEPT. 2012

II. Sektion/Teil 2: Galilei in der Wissenschaftsgeschichte, der Kultur- und Wissensgeschichte:
Moderation: Volker Remmert

9.00 Lutz Danneberg (Berlin): Galilei im Spannungsfeld von Teleskop und der Autorität der Schrift
9.45 Sven Dupré (Berlin): Galileo and the Culture of Glass

10.30 *Coffeebreak*

11.00 Simone De Angelis (Graz): „Wie also wissen wir, dass der Mond gebirgig ist?“ Probleme des Sehens in Galileis Reflexion über die Mondbeobachtungen
11.45 Matteo Valleriani (Berlin): Galileo's *Trattato della Sfera* in the Context of the Tradition of Practical Astronomy

13.00 *Pranzo / Mittagessen*

15.00 Richard Kremer (Hanover, NH): Galileo in Danzig

15.45 *Coffeebreak*

III. Sektion/Teil 1: Galilei und die visuelle Kultur
Moderation: Simone De Angelis

16.30 Alessandro Tosi (Pisa): Le arti e Galileo
17.15 Andreas Thielemann (Rom): Himmelsfeuer. Astronomie und Kosmologie in Adam Elsheimers *Flucht nach Ägypten* (1609)

MITTWOCH, 5. SEPT. 2012

III. Sektion/Teil 1: Galilei und die visuelle Kultur
Moderation: Lutz Danneberg

9.00 Nick Wilding (Atlanta): The *Sidereus Nuncius*: reports from the margins and gutters
9.45 Claus Zittel (Berlin): Della Bellas Frontispize (für Galilei)

10.30 *Coffeebreak*

11.00 Stefano Gattei (Lucca): *Imagines loquentes*: Johannes Kepler's Non-Verbal Argumentats for the Copernican Hypothesis

11.40 Schlussdiskussion

International Conference: Intellectual and Institutional Innovation in Science

GEFÖRDERT VOM

Bundesministerium für Bildung und Forschung

Conference Location: Conference center of the Berlin-Brandenburgische Akademie der Wissenschaften, Jägerstraße 22/23, 10117 Berlin, Germany

Conference Time: September 13-15, 2012

Conference Organizer: Prof. Dr. Thomas Heinze, University of Wuppertal, Germany & Prof. Dr. Richard Münch, University of Bamberg, Germany

Conference Sponsor: Federal Ministry for Education and Research (BMBF) Program „New Governance of Science“

Conference Committee:

Prof. Dr. Mats Benner, University of Lund
Prof. Dr. Dietmar Braun, University of Lausanne
Prof. Dr. Susan Cozzens, Georgia Institute of Technology
Prof. Dr. Ronald E. Doel, Florida State University
Prof. Dr. James E. Evans, University of Chicago
Prof. Dr. Jacob D. Hamblin, Oregon State University
Prof. Dr. Stefan Kuhlmann, University of Twente
Prof. Dr. Jacques Mairesse, CREST-INSEE Paris, France
Prof. Dr. Patrick McCray, UC Santa Barbara
Prof. Dr. Ben Martin, University of Sussex
Prof. Dr. Christine Musselin, Sciences Politique
Prof. Dr. Dominique Pestre, EHESS Paris
Prof. Dr. Philip Shapira, University of Manchester
Prof. Dr. Richard Whitley, University of Manchester
Prof. Dr. Lynne Zucker, UC Los Angeles

Conference Program (August 27, 2012)

Thursday, Sept. 13, 2012

Theme A: Capabilities of research organizations and national research systems to generate and develop original and transformative intellectual contributions

8:00 – 9:00	Registration
9:00 – 9:15	Welcome Address by Conference Organizers
9:15 – 9:30	Keynote by MinDirig Dr. Dietrich Nelle, German Ministry for Education and Research
9:30 – 11:00	Session A1: Current challenges for the governance of science and technology Chair: Richard Muench
	Richard Whitley, University of Manchester, United Kingdom Institutional change and scientific innovations: The roles of protected space and flexibility
	Edward J. Hackett, Arizona State University, United States From Salomon's House to Synthesis Centers
11:00 – 11:15	Short Coffee Break
11:15 – 12:45	Session A1: Current challenges for the governance of science and technology (continued) Chair: Richard Muench
	James Evans, University of Chicago Stability and conformity in scientists' research strategies
	Thomas Heinze, University of Wuppertal, Germany Intellectual and institutional innovations: conceptual considerations, bibliometric evidence, and examples from science history
12:45 – 14:00	Lunch Break
14:00 – 15:30	Session A2: Systems of patronage and the formation of new research fields Chair: Dominique Pestre
	Ronald Doel, Florida State University, Tallahassee, United States The U.S. military's role in creating the Cold War environmental sciences – or, what's the place of the physical environmental sciences in environmental history?
	Roger Launius, Smithsonian Institution, National Air and Space Museum, Washington, United States NASA and the Building of an Earth Science Discipline in the 1960s
15:30 – 16:00	Coffee Break
16:00 – 17:30	Session A2: Systems of patronage and the formation of new research fields (continued) Chair: Dominique Pestre
	David Baneke, University of Leiden, Netherlands Philips and the industrial-academic complex in the Netherlands after the Second World War
	Thomas Pfister, Zeppelin University, Germany Shaping European integration studies – between politics and disciplines
17:30 – 18:30	Discussion, introduced by a provocative statement and moderated by Mats Benner, Lund University, Sweden
18:30	Reception

Friday, Sept. 14, 2012

Theme A: Capabilities of research organizations and national research systems to generate and develop original and transformative intellectual contributions (continued)

8:30 – 10:00 Session A3: National research systems and intellectual innovation
Chair: Thomas Heinze

Grit Laudel, University of Twente, Netherlands
How do national career systems promote or hinder the emergence of innovative research?

Lars Engwall and Tina Hedmo, University of Uppsala, Sweden
Raphaël Ramuz, University of Lausanne, Switzerland
Institutional and disciplinary conditions versus innovation: Corpus Linguistics in Switzerland and Sweden

10:00 – 10:30 Short Coffee Break

10:30 – 12:00 Session A4: Assessment of funding schemes for transformative research
Chair: Cyrus Mody

Irwin Feller, American Association for the Advancement of Science, United States
Transformative organizations and transformative science: Evidence from the performance of National Science Foundation Science and Technology Centers

Jochen Gläser, Technical University Berlin, Germany
Beyond "breakthrough research" - epistemic properties of research and their consequences for research funding

12:00 – 13:00 Lunch Break

13:00 – 14:30 Session A5: Effects of institutional context on scientists' behavior
Chair: James Evans

Jacques Mairesse, Graduate School of Economics, Statistics and Finance Paris, France
Do Gender and Motherhood Affect Scientific Productivity? A Bird's Eye View of the Literature and Results of Econometric Investigation on a Longitudinal Dataset of French Physicists

Julien Pénin, University of Strasbourg, France
Motivation crowding-out effect: Is there a risk for science?

Theme B: Capabilities of research organizations and research systems to take up intellectual developments and to institutionalize new fields of research

14:30 – 16:00 Session B1: Current challenges in the institutionalization of new research fields
Chair: Ronald Doel

Cyrus C.M. Mody, Rice University, United States
Replication and evolution of research organizations: The case of U.S. academic microfabrication user facilities

Silke Beck, Helmholtz Center for Environmental Research, Leipzig, Germany
Global environmental assessments between the globalization of science and the restoration of national sovereignty over science policy

16:00 – 16:30 Coffee Break

16:30 – 18:00 Session B2: Sponsor organizations responding to emerging research fields
Chair: Christine Musselin

Marc Rothenberg, National Science Foundation, United States
Funding Emerging Research Areas: NSF Past Strategies

Frank van der Most, University of Amsterdam, Netherlands
Changes in research funding systems due to emerging new fields of research? The case of nanotechnology in the Netherlands.

18:00 – 19:00 Discussion, introduced by a statement on how conferences stimulate intellectual innovation by Roger H. Stuewer, University of Minnesota, Minneapolis, United States

20:00 Dinner (external restaurant)

Saturday, Sept. 15, 2012

Theme B: Capabilities of research organizations and research systems to take up intellectual developments and to institutionalize new fields of research (continued)

8:30 – 10:00 Session B3: Institutional innovation outside the universities
Chair: Philip Shapira

Olof Hallonsten, University of Gothenburg, Sweden
From particle physics to photon science labs. The gradual transformations of DESY and SLAC through multi-level renewal and adaptation

Eva Barlösius, University of Hannover, Germany
Institutional change in government laboratories: Evidence for Germany

10:00 – 11:00 Coffee Break and Poster Session

Poster 1: Clemens Blümel, Humboldt University Berlin, Germany

Poster 2: Steffi Heinecke, University of Wuppertal, Germany

Poster 3: Heiko Heiberger, University of Bamberg, Germany

Poster 4: Elias Hakansson, University of Uppsala

Poster 5: Petra Schaper-Rinkel, AIT Vienna & Bernd Beckert, Fraunhofer ISI, Germany

Poster 6: Ramya Rajagopalan, University of Wisconsin-Madison, United States

11:00 – 12:30 Session B4: New research fields and their relation to the political system and mass media
Chair: Richard Whitley

Matthew Eisler, University of California at Santa Barbara, United States
The idea of the idea factory. Ideology of innovation in comparative historical perspective

Martina Franzen, University of Bielefeld, Germany
Media attention and its repercussions on science: results of a cross-disciplinary analysis

12:30 – 13:30 Lunch Break

13:30 – 15:00 Panel discussion, moderated by Richard Münch, University of Bamberg

Panelists:
Ronald Doel, Florida State University
James Evans, University of Chicago
Olof Hallonsten, Gothenburg University
Christine Musselin, Sciences Politique – CSO, Paris

15:00 – 15:30 Concluding remarks by Conference Organizers

15:30 Farewell with Coffee and Cake

PROGRAMM

Anthropologische Dimensionen des Umgangs mit Natur

Informationen zur Tagung und zum Tagungsprogramm:

Dr. Thomas Kirchhoff:
thomas.kirchhoff@fest-heidelberg.de

Prof. Dr. Gerald Hartung:
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VolkswagenStiftung

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BERGISCHE UNIVERSITÄT WUPPERTAL

F·E·S·T

WELCHE NATUR BRAUCHEN WIR?

Anthropologische Dimensionen des Umgangs mit Natur

Symposium an der Forschungsstätte der Evangelischen Studiengemeinschaft e.V.

Symposium
19. - 21. 09. 2012

an der Forschungsstätte der
Evangelischen Studiengemeinschaft e.V.
Schmeilweg 5, 69118 Heidelberg

Welche Natur brauchen wir?

Mittwoch, 19. 09. 2012

0. Begrüßung und Einführung

14:00 **Begrüßung.** Thomas Kirchhoff

14:15 **Thematische Einführung.**
Gerald Hartung (Philosophie)

14:45 Kleine Kaffeepause

I. Analysen des Mensch-Umwelt-Verhältnisses: zwischen Natur und Kultur, Bindung und Freiheit

15:00 **Objektive Gefühle in der Natur? Überlegungen jenseits von Konstruktivismus und Projektionismus.**
Michael Großheim (Philosophie/ Phänomenologie)

15:30 **Zur Inter-Subjektivität ästhetischer Naturerfahrung.**
Jörg Zimmermann (Philosophie/ Ästhetik)

16:00 **Kommentar:** Vera Vicenzotti (Landschaftsplanung/ Kulturwissenschaft)

17:00 Kaffeepause

17:30 **Natur naturwissenschaftlich erkennen.**
Ulrich Krohs (Biologie/ Wissenschaftstheorie)

18:00 **Die Natur, der Raum und die Macht.**
Frank Uekötter (Geschichtswissenschaft)

18:30 **Kommentar:** Thorsten Moos (Ethik/ Theologie)

19:30 Abendessen

Donnerstag, 20. 09. 2012

09:00 **Verkörperung, Sozialität und Kultur.**
Thomas Fuchs (Psychiatrie/ Philosophie)

09:30 **Der lebensweltliche Erfahrungsraum – die Natur-Technik-Differenz.** Gregor Schiemann (Natur- und Wissenschaftsphilosophie)

10:00 **Kommentar:** Matthias Wunsch (Philosophie)

11:00 Kaffepause

11:30 **›Naturzeit‹ – Dynamik und Veränderlichkeit des Lebens.** Michael Wink (Evolutionsbiologie)

12:00 **Die Natur als Resonanzraum und als Quelle starker Wertungen.** Hartmut Rosa (Soziologie)

12:30 **Kommentar:** Thomas Renkert (Theologie)

13:30 Mittagessen

15:00 **Leben in natürlichen Umwelten. Müssen wir die historisch entstandenen Ökosysteme erhalten?**
Thomas Kirchhoff (Ökologie/ Naturphilosophie)

15:30 **Künstliche Lebenswelten. Anpassungsleistungen als soziale Ressource.** Jörn Ahrens (Kultursoziologie)

16:00 **Kommentar:** Gerald Hartung (Philosophie)

17:00 Kaffepause

17:30 **Schöpfung bewahren oder verändern?**
Dirk Evers (Theologie)

18:00 **Natur erhalten oder verbrauchen?**
Hans Diefenbacher (Ökonomie)

18:30 **Kommentar:** Magnus Schlette (Philosophie)

19:30 Abendessen

Freitag, 21. 09. 2012

09:00 **Die Natur als das Gegebene. Naturschutz im Spannungsfeld von sozialen, kulturellen und ökologischen Maximen.**
Heinrich Spanier (Naturschutz)

09:30 **Natur als Raum von Eigenrechten? Anfrage aus ethischer Perspektive.** Heike Baranzke (Theologie)

10:00 **Kommentar:** Henrike Lerch (Philosophie)

11:00 Kaffepause

II. Praxen unseres Umweltverhältnisses: Aktuelle Schnittstellen der Diskurse über Natur

11:30 **Wie viel Natur braucht der Mensch? Anmerkungen aus psychologischer und pädagogischer Sicht.**
Ulrich Gebhard (Umweltpsychologie / Umweltpädagogik)

12:00 **Natur als Erholungsraum. Welche Natur fördert psychisches Wohlbefinden?**
Dörte Martens (Sozial- und Umweltpsychologie)

12:30 **Kommentar:**
Dorothee Rodenhäuser (Politikwissenschaft)

13:30 Mittagessen

15:00 **Die Natur des verbesserten Menschen.**
Michael Hauskeller (Philosophie/ Bioethik)

15:30 **Konstruierte Natur? Eine Fallstudie zur Synthetischen Biologie.**
Kristian Köchy (Biophilosophie)

16:00 **Kommentar:** Christine Zunke (Philosophie)

17:00 Kaffeepause

17:30 **Ecological engineering – Erfahrungen und Perspektiven am Beispiel asiatischer Reislandschaften.** Josef Settele & Benjamin Burkhard (Biologie/ Landnutzungsforschung)

18:00 **Kommentar**:
Volker Teichert (Ökonomie/ Umweltmanagement)

20:00 Abendessen im Hotel zum Ritter/ St. Georg

Anthropologische Dimensionen des Umgangs mit Natur

Anhang

VolkswagenStiftung

Leibniz Universität Hannover

Hubertus Fischer, Volker Remmert, Joachim Wolschke-Bulmahn (eds.)

Gardening and Knowledge

Landscape Design and the Sciences in the Early Modern Period

Symposium

September 17-19, 2012

Abstracts and CVs

Zentrum für Gartenkunst und Landschaftsarchitektur
Leibniz Universität Hannover

IZWT Interdisziplinäres Zentrum für Wissenschafts- und Technikforschung
Normative und historische Grundlagen

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Contents

Abstracts and CVs

Introduction

Hubertus Fischer, Volker Remmert, Joachim Wolschke-Bulmahn

Gardening and Knowledge. Landscape Design and the Sciences in the Early Modern Period – An Introduction

Whether medicine, mathematics or botany: a systematic investigation into the connections between knowledge and gardens has yet to be undertaken. Despite numerous case studies, basic analyses are not even available for individual knowledge formations, for generating and systematising, for transferring and for applying specific forms of knowledge to horticulture and garden art. The research project "Landscape Design and the Sciences in the Early Modern Period – Mathematisation and Scientization in Early Modern Garden Art" is intended to fill in a sensitive gap for the 16th to 18th centuries. It is being jointly organised by the Centre of Garden Art and Landscape Architecture (CGL) of the Leibniz Universität Hannover and the Interdisciplinary Centre for Science and Technology Studies (IZWT) of the Bergische Universität Wuppertal.

The interdisciplinary symposium "Gardening and knowledge. Landscape design and the sciences in the Early Modern Period", funded by the Volkswagen Foundation, is to launch the project and will discuss research issues and research hypotheses and define sub-projects to be worked on as qualification theses. Based on a preliminary assessment, these could include, for example, practical geometry as a key technology in garden art and the connections and interrelations between theoretical aspects of the mathematical sciences and garden theory, but would also include aspects of perspective, optics, acoustics, astronomy/astrology and hydrology. They could be case-studies on individual artists and scientists or also contexts of knowledge in literary genres of the time, which explore and reflect on connections between gardens and sciences on a different level. Finally, a comparative look at the role and function of mathematics/geometry in the garden art of the cultures of the Orient could also be contemplated.

There are options for linking up with other projects in the Royal Garden of Herrenhausen Library project, which has already started, in which the dissertation project entitled "Der Berggarten – seine wissenschaftliche Bedeutung und sein Stellenwert als botanischer Garten im (exemplarischen) Vergleich zu anderen bedeutenden Hofgärten und akademischen Gärten" (The Berggarten – its scientific importance and significance as a botanical garden in comparison with other important court gardens and academic gardens) brought new results and insights regarding the paradigm of 'botanical knowledge'. There are also possible points of contact in the direction of Modernism, inasmuch as the conference on "Modernism and Landscape Architecture, 1890-1940", organised by the CGL in collaboration with the National Gallery of Art, Washington D.C. in 2008, investigated for the first time the influence of ecology, including plant ecology, plant geography and plant sociology on the

garden architecture of the late 19th and early 20th centuries. An important contribution to the topic of "knowledge transfer" has already been made by Bianca Maria Rinaldi in her dissertation on "Jesuits and Europe's Knowledge of Chinese Flora and Art of the Garden in the 17th and 18th Centuries", which was written at the CGL and was supported with a grant from the Klosterkammer Hannover.

The IZWT, too, has a strong interest in the various exchange processes between early modern landscape design and the early modern sciences as reflected in research projects such as "Botanical Knowledge at the Court of Cosimo III" and "John Evelyn's Elysium Britannicum and Early Modern Science".

The study of Early Modern garden history continues to attract much interest. In the past twenty years, its research has developed quite dramatically and has shown itself open for different methodological and theoretical influences from the humanities and social sciences. Thus a traditional perspective geared to art history, with a tendency to be narrowly focussed, has gradually been replaced by more interdisciplinary approaches to the history of gardens. One of the foremost supporters of these developments and of the systematic broadening of research perspectives to encompass the history of garden culture and garden art was the Harvard research institute of Dumbarton Oaks in Washington D.C. with its Studies in Landscape Architecture Department, today Garden and Landscape Studies. Dumbarton Oaks is now partner of the CGL in a joint-edition project with special regard to garden technology.

In the context of this research and of the research conducted by other institutions, mathematics and the natural sciences in general have repeatedly been examined in connection with garden art and garden culture; however they were rarely the subject of systematic and in-depth efforts that enabled issues to be developed comprehensively and investigated in a larger interdisciplinary research group.

The presentations on the occasion of the symposium "Gardening and knowledge. Landscape design and the sciences in the Early Modern Period" cover a broad range of topics, reaching from John Evelyn, the Elysium Britannicum and the generation/creation of knowledge, to water technology, the increase of knowledge and its impact on gardens in the time of the Renaissance, to botanical illustrations and the cultivation of botanical knowledge in the early modern era, theory of perspective in Early Modern garden art and, in general, the scientific approach and professionalism in garden art historiography in the Early Modern Period.

We hope that the symposium, which marks the beginning of a more intense co-operation of the CGL and the IZWT, will promote future research and, hopefully, encourage collaboration on joint research projects on issues of gardening and knowledge, landscape design and the sciences in the Early Modern Period as well as the periods to follow.

We would like to thank the Volkswagen Foundation for funding this symposium in such a generous way. We owe a great thank you to Dr. Sabine Albersmeier, director of the CGL-office, and her team who took care of the organisational preparation of this event as well as of getting this brochure published for the speakers and participants of the symposium.

Abstracts and CVs

Alexander Ditsche

Water-powered Musical Automata in Prestigious European Gardens of the 16th to 18th Century

In ancient Greece, knowledge about complex hydraulic mechanisms began to flourish for the first time. Incidentally, this was also the age during which automata with moving objects were developed. Furthermore, the invention of the hydraulis – a precursor to our modern organ – was a vital element of occidental history. Initially used as a popular musical instrument at large events and competitions, it quickly became an imperial medium of representation. At the Byzantine court, in particular, organs and other means of mechanical sound production were held in high esteem. While the technology later became obsolete among the European cultures of the Middle Ages, it continued to be appreciated and developed in the Arab cultural sphere.

During the Italian Renaissance many ancient inventions were rediscovered, such as the basic principles of hydraulics and well construction. It is hence not surprising that it was an Italian garden, the Villa d'Este in Tivoli, that in 1566 became the backdrop for a merger between water-powered sound production and music automatons. The popularity of ancient texts (by Heron of Alexandria, Vitruvius, etc.) no doubt played a major role in this context. The extent to which Arab culture contributed to this development is a matter for further research.

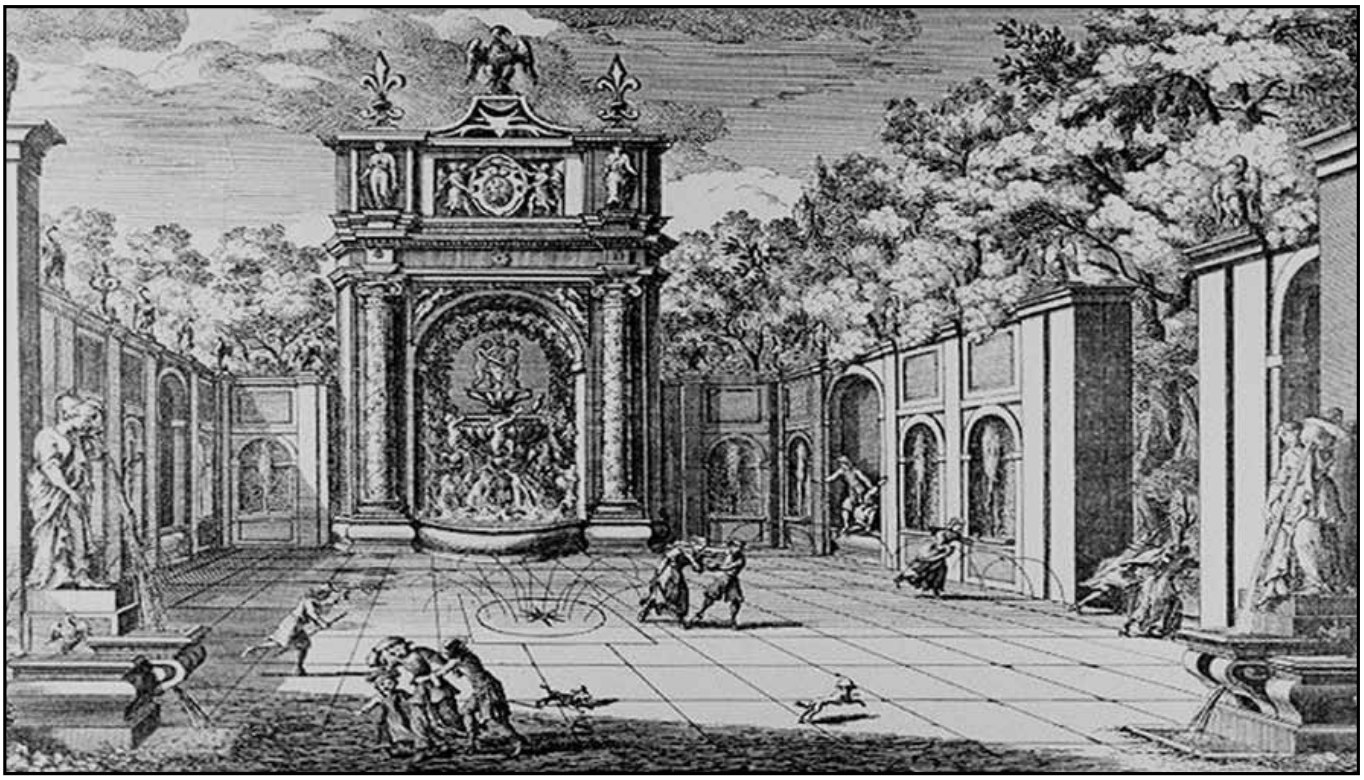


Fig. 1: Villa d'Este, Fontana della civetta, copper engraving (G.F. Venturini, 1691)

The first fountain to be built in the gardens of the Villa d'Este was the *Fontana della civetta*, a well system with the moving figure of an owl and the twittering of birds produced by small pipes and water (Fig. 1). It was based directly on a model described by Heron of Alexandria (Fig. 2). Also in 1566 construction began on the *Fontana dell'Organo*, a large fountain with a water-powered musical automaton in the form of an organ at its center. A piece of music with five voices was stored on a roll pin which thanks to the ingenious mechanism of an Aeolic chamber could be continuously played for days (Fig. 3).

A contrasting and indeed competing attraction in many travelogues was the Villa Medicea in Pratolino, which was built a few years later for Francesco de Medici. The estate featured a Parnassus with an integrated water organ, as well as several automatons with moving statues and water-powered background music that were installed in the cavernous basement of the villa and throughout the main part of the garden. Pratolino was the figure-dominated counterpart to Tivoli's rather more acoustically dominated system.

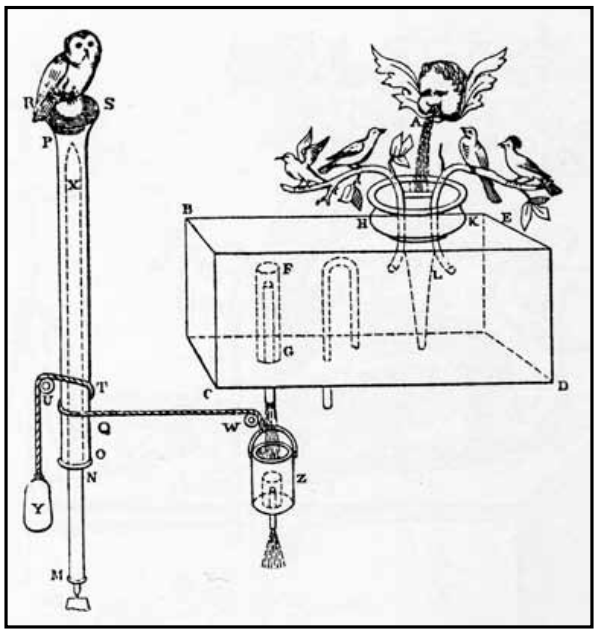


Fig. 2: Functional sketch of a Birds-Fountain as described by Heron of Alexandria (Heckmann, Herbert: *Die andere Schöpfung. Geschichte der frühen Automaten in Wirklichkeit und Dichtung*, Frankfurt am Main 1982, p. 43)

These gardens inspired a rapid spread of hydro-pneumatic automatophones even beyond the Alps to the north, a phenomenon reflected in the monumental organ in the Quirinal Palace in Rome (built under Pope Clement VIII), the Villa Aldobrandini in Frascati (the family home of Pope Clement VIII) and Chateau-Neuf in Saint-Germain-en-Laye near Paris (under Henri IV). Other important sites include the famous grottos of Hellbrunn Palace in Salzburg (built by Archbishop Marcus Sitticus, Count of Hohenems), the Hortus Palatinus in Heidelberg (commissioned by Friedrich V, Elector Palatine), Wilton House, Wilton (built under Lord Philip Herbert, 4th Earl of Pembroke), the Grotto of Thetis at Versailles (built under Louis XIV) and Wilhelmshöhe Park in Kassel, Germany (developed under Charles I,

Landgrave of Hesse-Cassel.) Traces of the existence of hydro-pneumatic automatophones can also be found along a north-to-south axis from London to Naples as well as along the east-to-west line between St. Petersburg and Seville. However, the actual extent to which they spread across Europe is still a matter of speculation.

Their special historical significance is manifested, for one, in their use on ceremonial occasions. The enormous investment and maintenance costs of these objects doubtless meant they were status symbols. For another, water-organs and other hydro-pneumatic automatophones represented a technical innovation and were living proof of their owners' connoisseurship. Maybe they were considered to be curiosities in terms of the equipment of a Wunderkammer (chamber of curiosities), too. Although only little is known about hydro-pneumatic automatophones today, they certainly had a significant influence on the design and use of many 16th to 18th century gardens.

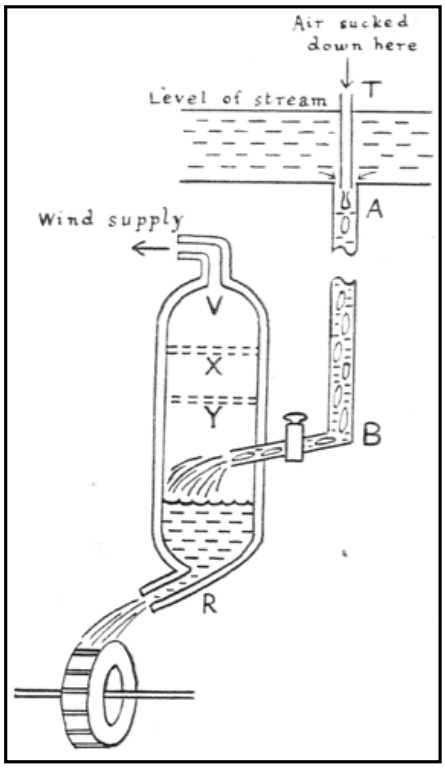


Fig. 3: Functional sketch of an Aeolic chamber (Jeans, Susi and Oldham, G.: Water-blown Organs in the 17th Century in: *The Organ* 1958 (38), p. 156)

CV

Alexander Ditsche, born 1977 in Bonn. Internship as a financial consultant in banking business and continuous employment in a bank to this day. From 2002 onwards additional studies in art history, musicology and economic sciences at the University of Bonn. Since 2010 he is working on a dissertation about water-powered music-automata (Department of Art History, University of Bonn). Besides his work as a choir director and conductor he additionally holds a lectureship in compositional techniques and analysis of music at the Department of Musicology (University of Bonn) since 2010.

Alette Fleischer

Gardening Nature, Gardening Knowledge: Early Modern Gardens and the Rise of Natural Knowledge

This paper focuses on the parallel and interactive processes of making gardens and natural knowledge robust. Gardening entails collecting and controlling nature within an enclosure at a specific site, whereas the construction of natural knowledge entails an accumulation, stabilization, and circulation of nature. To put it in Latourian terms, cultivators of nature and knowledge reshaped nature in mutable and immobile gardens and simultaneously transformed natural knowledge into immutable and mobile materials, such as books and prints.

Making something robust meant creating a durable, resilient, long-lasting object that contained knowledge (of plants, of the laws of nature, of gardens, etc). Furthermore, the level of robustness is culturally determined, as gardeners combined, adapted, and constructed different natural or artificial elements of nature and knowledge. Before a change can be made, it needs to be made robust. Making materials and knowledge robust could be done for multiple - and sometimes related - purposes. A robust object allows others to see or handle the same object or knowledge; for example, a robust garden in another season is still the same garden, even if the flowers are not in bloom. A robust object can be transportable; i.e. a bulb or seed that is carefully packed, can be shipped, and planted in gardens elsewhere. Produced knowledge, rendered immutable and mobile, contained on paper, is consumed by other cultivators elsewhere.

This ongoing circulative process can, at any time, affect one of its parts that, in turn, can change other elements. The interconnected processes of making knowledge and materials robust were firmly tied to an ongoing adaptation, production, consumption, and circulation, of objects, nature, and knowledge. A change of insights, obtained through the manipulation and contemplation of nature, could replace existing beliefs. This paper will pair the act of gardening with the rise of natural knowledge by discussing the gardens of two Dutch estate owners (diplomat and courtier Hans Willem Bentinck's Zorgvliet in The Hague and statesman Hieronymus van Beverningh's Oud-Teylingen near Leiden), and the scientific activities of the Dutch botanist-merchant Jacob Breyne in Danzig (Poland) and Dutch mathematician Christiaan Huygens in Paris.

In the seventeenth century, humans believed that they had the tools and knowledge to improve the earth by reworking nature. Gardeners (be that: garden owners, amateurs, mathematicians, merchants, gentlewomen, doctors, artisans, painters, etc.) showed their dominion over the earth through gardening. The challenge was to change nature by waxing seedlings indoors or under glass domes, to use manure as a fertilizer and keeping tender plants warm, to create sheltered walkways to protect visitors from rain or sun, and

to plant local and exotic shrubs, trees, and bulbs that blossom or bear fruit in different months of the year. The act of transforming nature by using art could also take the shape of an architectural garden structure, such as a grotto. Through art nature could be made robust, while at the same time gardeners used art to change and explain (the laws of) nature.

A garden can be considered a laboratory, a unique site for the production and consumption of natural and material knowledge. In this 'laboratory' local conditions are minimized as much as possible, in favour of constructing an environment in which a gardener hoped to achieve the same (botanical) results as in any other such space, regardless of the actual geographical setting.[1] Cultivators of knowledge and nature found ways to make nature and natural knowledge robust and transportable for others to see, to understand, to (re-) use it, to adapt it and comment on it. In order to facilitate this intertwined process of hand and mind gardeners established communal grounds where to exchange, collect, and communicate their mental and manual findings.

In order to map the process of mobile and immobile, mutable and immutable and how this is tied to making knowledge and nature robust, this paper moves between gardens, botanists, gardeners, and books. On one end of the spectrum there are the immobile and mutable gardens, and on the other end the immutable and mobile books. Books and gardens are interconnected as garden owners, botanists, and gardeners, who, through their activities produce and consume knowledge and nature. This entailed getting into an actual garden, collecting and publishing books, and adapting and circulating nature and knowledge.

Since gardens are confined by time and space, one option to exchange material and knowledge was to do that *in situ*. For instance, George London, the gardener to the Bishop of London, toured through Holland in the mid-seventeenth century and collected plants from private and botanical gardens in The Hague, Amsterdam, and Leiden. London visited Oud-Teylingen, an estate with "gardens, orchards, planted trees, canals, and waterworks, of about five *morgen* (ten acres)" near Leiden, listing each plant he took.[2] It was owned by the retired statesman and amateur Hieronymus van Beverningh (1614-1690), who was an avid collector and cultivator of exotic plants and of botanical books to further examine and enjoy nature's riches. Later, the English botanist and physician Leonard Plukenet tran-

1 A number of historians and sociologists of science have commented on this process where human and environmental spaces are standardized in order to accommodate the production of scientific knowledge. David Livingstone sums this up by calling laboratories 'placeless places' (see: David N. Livingstone, *Putting Science in its Place, Geographies of Scientific Knowledge* (Chicago/London: The University of Chicago Press, 2003), p. 23).

2 H. Veendorp and L. Baas Becking, *Hortus Academicus Lugduno Batavus, the development of the gardens of Leyden University 1587-1937* (Haarlem: Joh. Enschedé, 1938), p. 82 (Regionaal Archief Leiden: Archiefnr. 512, inventarisnummer 687).

scribed London's notes into a schematic overview of Dutch gardens and their collections of exotic plants. This act made these botanical findings robust for Plukenet's patron, the British Queen (fig. 1).

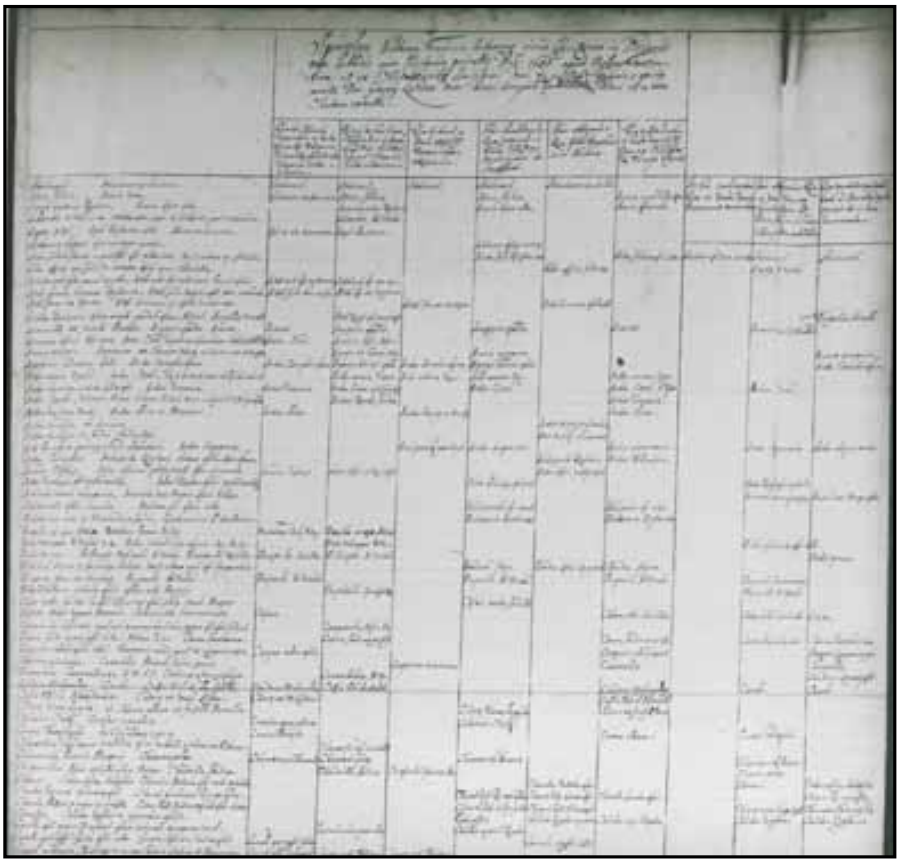


Fig. 1: Leonard Plukenet, S*peculum Herbarium Fruticum (etc)*, 1685 (ms Sloane Herbarium, Natural History Museum London)

Beverningh frequently received touring gardeners and botanists who were interested in his garden and his collection of botanical books. The Dutch merchant and botanist Jacob Breyne, living in Danzig (Poland) was a frequent visitor of Beverningh's estate. Breyne (1637-1697) was a garden lover with a passion for botany. This led to a growing collection of plants (dried and alive), drawings, and plant books. He published several books on botany which he financed himself in the second half of the seventeenth century. His books filled with dried plants were a step along the way for him to transform flora to fit into a wider network of natural knowledge. In his published books, Breyne referred to older botanical publications, this way of working allowed him to compare flora to each other and notice similarities and differences, thereby contributing to a further understanding of nature.[3] Breyne, thus, made his botanical findings robust by publishing books. However, he used and adapted parts of the knowledge contained in earlier publications, making this knowledge less robust along the way (fig. 2).

3 Jacob Breyne, *Exoticarum aliarumque minus cognitarum Plantarum centuria prima* (Danzig, 1678); Jacob Breyne, *Prodromus Fasciculi Rariorum Plantarum* (Danzig: David Fridericus Rhetius, 1680); Jacob Breyne, *Prodromus Fasciculi Rariorum Plantarum, Primus et Secundus* (Danzig: Thom. Joh. Schreberi, 1739).

Gardeners, including physicians and apothecaries, produced books on garden theory, 'how-to' manuals, and plant types, their medicinal use and characteristics. Botanical amateurs like the Dutch merchant Jacob Breyne compiled and collected herbals of dried or painted exotic and local plants with names (usually in several languages) and their provenance. In the form of books, paintings, and prints, natural materials and knowledge were made solid, transportable and consumable, not only for contemporaries but for also for humans today. Through the production of plant books, unfamiliar flora became more visible and known to others, while it made earlier findings less robust.

Fig. 2: Jacob Breyne, *Herbarium Planta rariorum Borussia et Cassubia*, Danzig 1673

Next to plant books, there was a vast market for prints of gardens. Usually with a garden's general layout, specific sections, and details. Hans Willem Bentinck (1649-1709) ordered the artist Johan van den Aveele (1655-1727) to make a series of large and small etchings of his garden in the 1690s. Bentinck's garden at The Hague consisted of "delicate Gardens, Walks, Ponds, Motes, Grottoes, Fountaines and figures, Bridges and Gates and great Plenty of fruit and flowers very Curious and various; A place so neatly composed that here Art and Nature seem to go 'hand in hand'."[4] Passing visitors could purchase these etchings in local print shops to show friends at home the latest garden designs in Holland. Bentin gave prints away as gifts to foreign dignitaries to show (off) his garden.[5] Having prints made was a sign of wealth and power, the ability to control nature, and a display of one's refined taste and upbringing; and garden owners liked to collect prints themselves. It was a way to further distribute the latest insights on gardening, as it showed the garden owner's aesthetic interpretation of God's Creation, his knowledge of nature, and his ability to manipulate nature. The transformation of a garden into prints, made it robust and transportable, so other gardeners were able to consume an otherwise immobile object (fig. 3).

Parallel to gardens, prints, and books, garden structures such as architectural or sculptural objects equally consisted of mutable and mobile elements. One specific ornament in Bentinck's garden was the grotto of Ganymede. It had the shape of a small classical pavilion: a rectangular building with a symmetrical façade divided into four sections with

4 T. Penson, Harl. MS. 3516, f 14, quoted in R.C. Temple (ed.), *The Papers of Thomas Bowrey 1669-1713*, (London: Hakluyt Society, 1927), p. 52.

5 Japikse, *Correspondentie van Willem III en van Hans Willem Bentinck, eersten graaf van Portland,* deel 2, Rijks Geschiedkundige Publicatiën, kleine serie 24 ('s-Gravenhage: Martinus Nijhoff, 1928), p. 382, letter no. 376, 17 May, 1699, Henri Jules de Bourbon, Prince de Condé thanked Bentinck for the etchings.

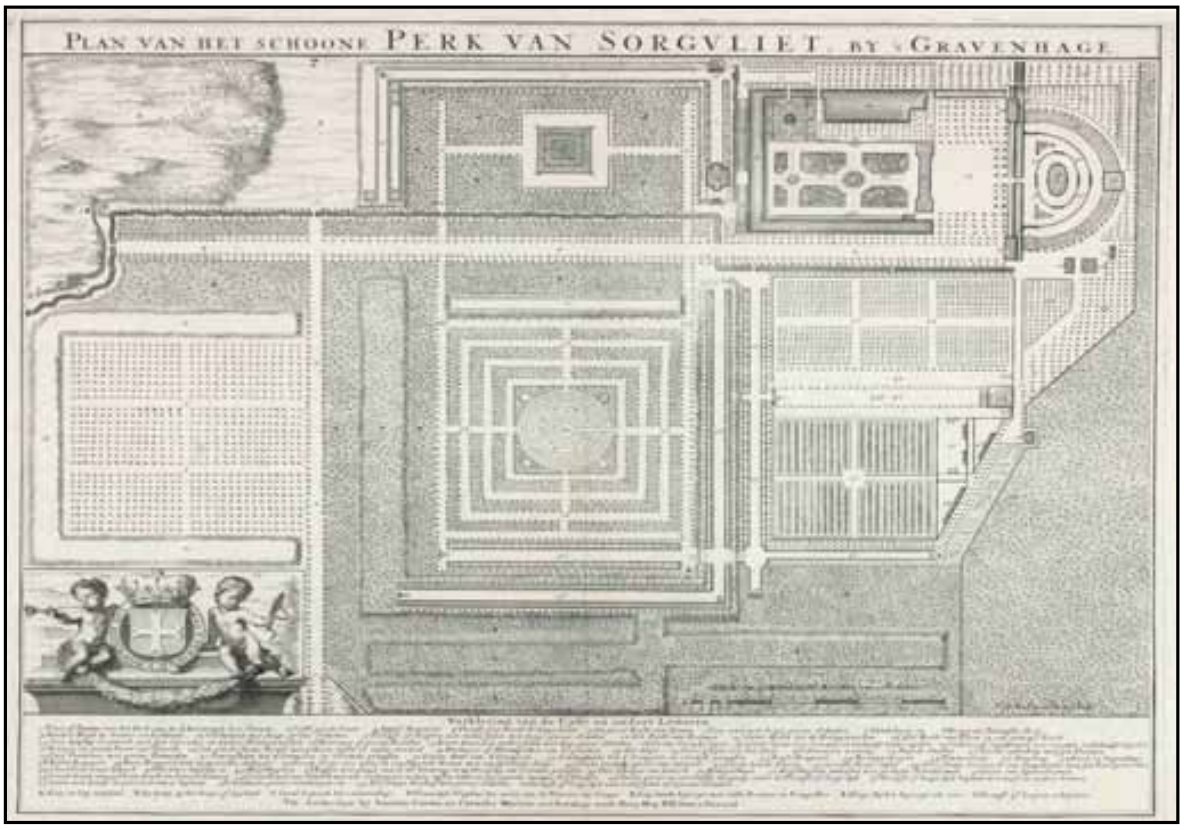


Fig. 3: Jan van den Avelen, *Map of Zorgvliet*, circa 1690 (no. z.gr. 191, Haags Gemeentearchief, Den Haag)

pilasters. It was "sett Curiously with Shells, Rock Corall and Lookinglasses, and in it a Fountain."[6] The grotto was also filled with crystals, and some ceramic lizards and snakes. Its makers tried to aesthetically evoke a real cave. It was partly compiled with materials from a disused grotto from another estate, which was shaped like a small domed mountain, made from boulders, and in it a room with the same shells, ceramics, and mirrors. In Bentinck's grotto these materials were resituated to show a geometrical explanation of nature instead of nature's irregularity (fig. 4).

Simultaneously, mathematician Christiaan Huygens (1629-1695) worked with crystals to explain the working of light. He combined his findings on light and crystals with Erasmus Bartholinus' publication on Iceland crystals.[7] Both Iceland crystal and rock crystal were admired and examined for the laws of nature they contained. For gardeners of nature and knowledge it was certain that crystal followed mathematical rules and by examining it nature's 'truths' or 'divine order' could be revealed. Huygens built his thesis by using parts of published works of others that he then transformed and adjusted. He then made it robust in his book *Traité de la Lumière* (Leiden, 1690). The parallels between Bentinck's garden grotto and Huygens' publication were that in both cases the nature of light was

6 *The Papers of Thomas Bowrey* 1669-1713, p. 50.

7 Fokko Jan Dijksterhuis, "Christiaan Huygens en de mechanica van het licht," *Doorbraken in de natuurkunde*, eds. Machiel Keestra and Anne Löhnberg (Amsterdam: Nieuwezijds, 2001), pp. 57-80, p. 64, Erasmus Bartholinus *Experiementa crystalli islandici disdiaclastici*.

explained. The mental and manual rendition of light's workings could only be given thanks to earlier examples. A garden grotto was just as mutable and (partially) mobile, as the publication on light proved to be.

Fig. 4: Jan van den Avelen, *Grotto of Ganymede*, interior, circa 1690 (no. kl. B 1514, Haags Gemeentearchief, Den Haag)

Gardeners, thus, found ways to make gardens, nature, and knowledge robust; nature, arrested in time and as printed material, transcended place and time. For gardens and natural knowledge to circulate, gardeners had to stabilize them, while simultaneously establishing reliability and trying to agree on nomenclature or natural laws. Authors of books referred to established publications to validate their own writings while adding their findings to a growing body of natural knowledge.[8] Circulating materials and knowledge underwent translation and transformation as others adapted them to meet local requirements or combined them with new findings. In turn, the transformed and augmented materials and knowledge could again be transported to other gardeners.[9] Other insights into garden grottos, nomenclature, explanations, and plants fuelled an ongoing change in gardening and gardens, and in the production and consumption of natural knowledge.

For producers and consumers, gardens and books jointly formed fertile soil for further natural inquiry. One site allowed for the enjoyment and examination of nature that was

8 Daniel Margocsy, "'Refer to folio and number': Encyclopedias, the Exchange of Curiosities, and Practices of Identification before Linnaeus," in: *Journal of the History of Ideas*, 71 (2010), pp. 63-89.

9 Livingstone, *Putting Science in its Place*, pp. 12 and 16.

mutable and fixed on one location: gardens. The other allowed for the contemplation and manipulation of nature that was flexible and mobile: material objects. Neither site could be constructed without the other, nor without the vast network of 'gardeners' who transformed nature to render it either temporarily or (semi-)permanently robust for others to see.

CV

Alette Fleischer is an independent scholar and is a part-time educator at the Amsterdam Royal Palace Foundation. She holds a MA in art history and a PhD in the history of science and technology. Her research connects the histories of natural inquiry and technology in the Low Countries in the seventeenth century by focusing on gardens. Here, people from different backgrounds came together to construct, examine, accumulate, and explain nature's workings, for reasons that could be both pleasurable and profitable. These actors ranged from merchants, philosophers, physicians, apothecaries, nobles, patrons, engineers, gardeners, botanists, and artisans, who were all guided by their own goals and interests to garden nature. In the mindful hands and in the skilful minds of various men and women, nature was scrutinized and transformed which enabled a hybrid of knowledge and material production and consumption, that could, in turn be circulated for others to see, contemplate, consume and use.

On this topic she has published the following:

"Trading Places: (ex)changing nature and knowledge at Cape of Good Hope, circa 1652-1700," *Centres and cycles of accumulation in and around the Netherlands during the early modern period*, ed. L.L. Roberts, (Münster: LIT Verlag, 2011, pp. 110-127).

Rooted in fertile soil: Seventeenth-century Dutch gardens and the hybrid history of material and knowledge production, dissertation University of Twente, 2010.

"(Ex)Changing Knowledge and Nature at the Cape of Good Hope, Circa 1652-1700," *The Dutch Trading Companies as Knowledge Networks, special issue of Intersections; Interdisciplinary Studies in Early Modern Culture*, 14 (2010), pp. 243-265.

"Into the Light: constructors and examiners of nature and a Dutch 17th century garden grotto," in: *History of Technology*, 29 (2009), pp. 113-139.

"The Beemster Polder: conservative invention and Holland's great pleasure garden," in: *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialisation*, eds. L.L. Roberts, Simon Schaffer, and Peter Dear, (Amsterdam: KNAW, 2007, pp. 145-166).

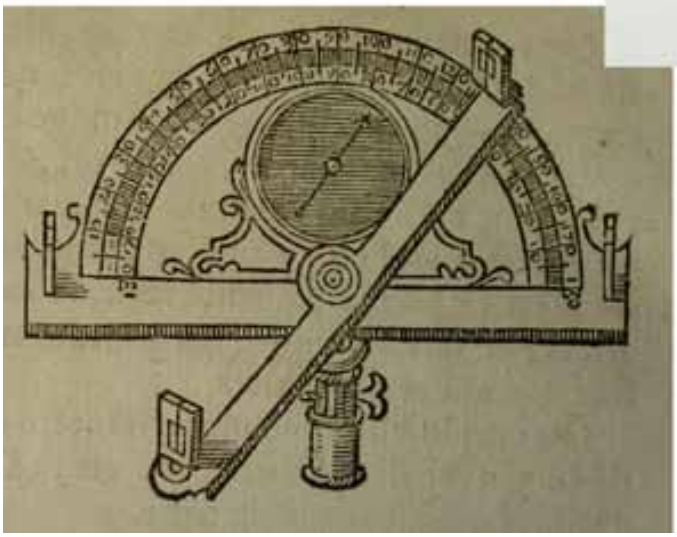
"The garden behind the dyke: land reclamation and Dutch culture in the 17th century," in: *ICON, Journal of the International Committee for the History of Technology*, 11 (2005), pp. 16-32.

Anthony Gerbino

The Topographical Survey and the Formal Garden: Cartography and Landscape in 17th-century France

The French formal garden is typically understood to have originated in a series of exemplary works of the early to mid-seventeenth-century. The most famous examples include designs by Jacques Lemercier at Richelieu, François Mansart at Maisons, and André Le Nôtre at Vaux-le-Vicomte. In comparison to their predecessors, these gardens are marked by a greater degree of unity between the château and the grounds surrounding it. In particular, the garden appears as the climax of a new, monumental approach to the house, with both elements subordinated to the same compositional symmetry and linked by a common axis. The new style appears to have originated, above all, in a desire for grand visual effects produced by manipulating the landscape on a previously unknown scale.

Graphomètre, 18th c., Collections of the Observatoire de Marseille



Graphomètre, from Dezallier d'Argenville, *La theorie et la pratique du jardinage* (1709)

Thierry Mariage was the first to draw attention to the technological context of this shift. In his influential book of 1990, *L'univers de Lenôtre*, he argued that one of the things that allowed gardeners to expand the scale of their work was a surveying instrument equipped

with sights, the *graphometre*, used to measure angles between distant objects. As Mariage pointed out, the device was originally developed in the late sixteenth century for use in cartography, to plot the distances between localities often many kilometers apart by means of linked or overlapping triangles. Marriage's insight raises a number of salient questions that historians have not yet fully developed. To what extent was the history of the French formal garden linked to contemporary advances in surveying? Were the architects of these spaces familiar with the practical mathematics that such techniques demanded? How might they have gained such knowledge?

To answer these questions, this paper proposes to look at the archival record, that is, at extant drawings of gardens in relation to actual surveying practice in the early seventeenth century. I focus, in particular, on the use of geometrical survey and proportionate scale in local, topographical maps. My analysis rests on a preliminary analysis of a large archival collection. The Series N of the Archives Nationales in Paris constitutes the major holdings of the *Department des cartes et plans* and contains some 3500 documents. It is conveniently catalogued and many of the entries are dated, so it is a fairly straightforward process to locate those early maps from the period of interest to us. There is, moreover, a good representation not only from the frontiers, where harbor and fortification projects are typically located, but also from the rural interior of the country. This latter group is useful because it includes provincial maps, estate surveys, and architectural plans produced by and for local inhabitants. Indeed, the collection's great value lies in the comparison it allows between the more sophisticated cartographic techniques used by royal engineers and by the landscape practitioners of the Paris basin with the work of provincial surveyors and architects throughout France.

When juxtaposed with this broader body of material, the extant plans for large-scale formal gardens stand in sharp relief. Exemplified by Le Nôtre's early plans for Vaux-le-Vicomte, these drawings show that the major breakthrough in the development of the French formal garden was the creation of large-scale project drawings that functioned, at the same time, as *plans d'arpentage*, products of a measured survey on the scale of an entire estate, a *seigneurie*. It was this technical innovation of architectural drawing that allowed the scale of the house to be applied consistently throughout the garden, allowing both to be seen in reciprocal relationship.

Where did this technique originate? Where was it learned? The paper considers the other professional communities concerned with the geometrical mapping of terrain in seventeenth-century France — namely surveyors, cartographers, architects, and military engineers. These groups were differentiated in terms of corporate identity, professional formation, and, not least, their level of mathematical knowledge, but they were all ultimately concerned with the same practical ends. Real advances in surveying and mapping depended on a process of competition and collaboration between professions, whereby

instruments and techniques exclusive to some were over time adopted by others. The development of the French garden — Le Nôtre's contribution, in particular — owes its origin to precisely this process.

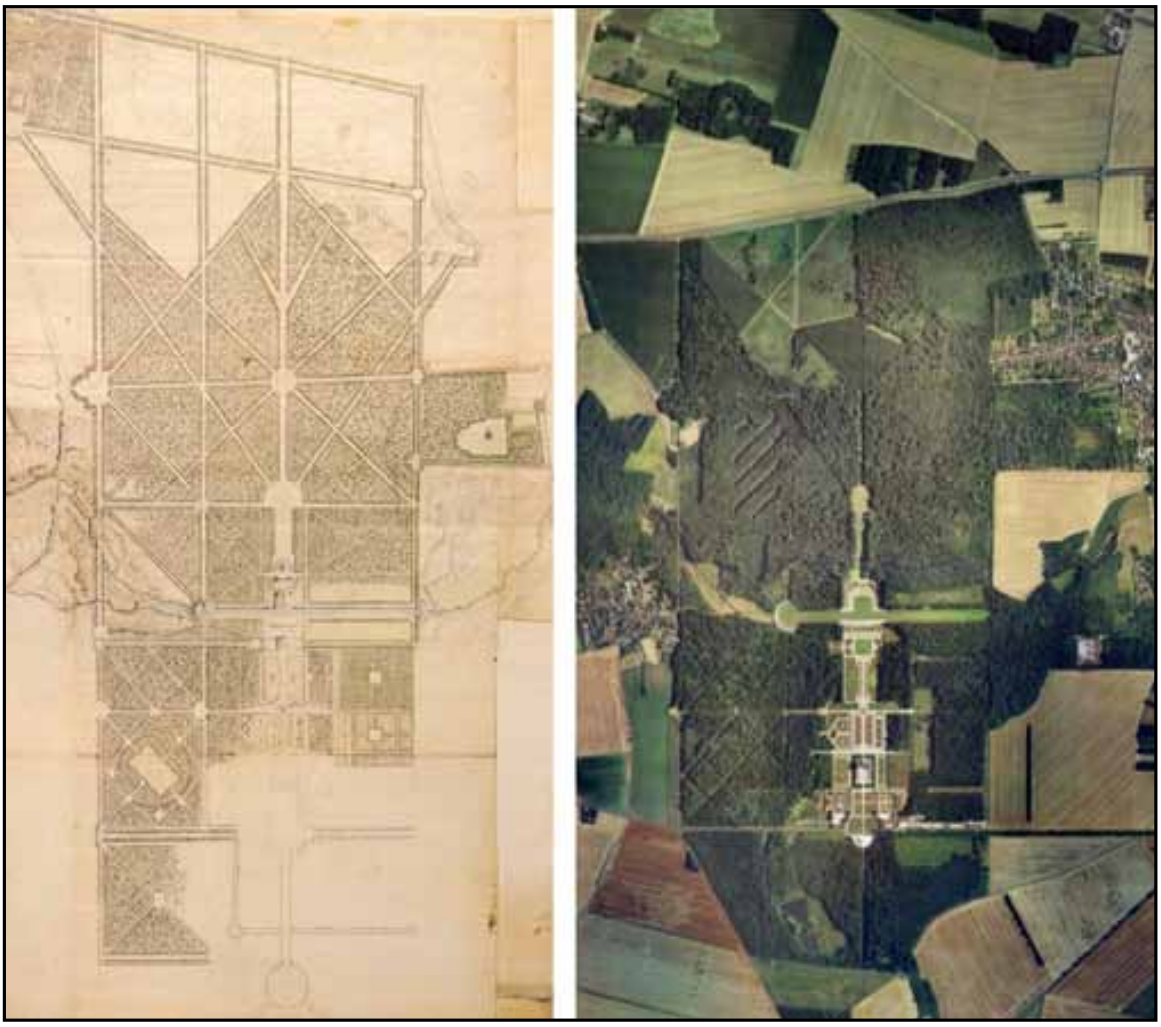


Fig. 1: Preparatory plan for Vaux-le-Vicomte, early 1650s, Institut de France

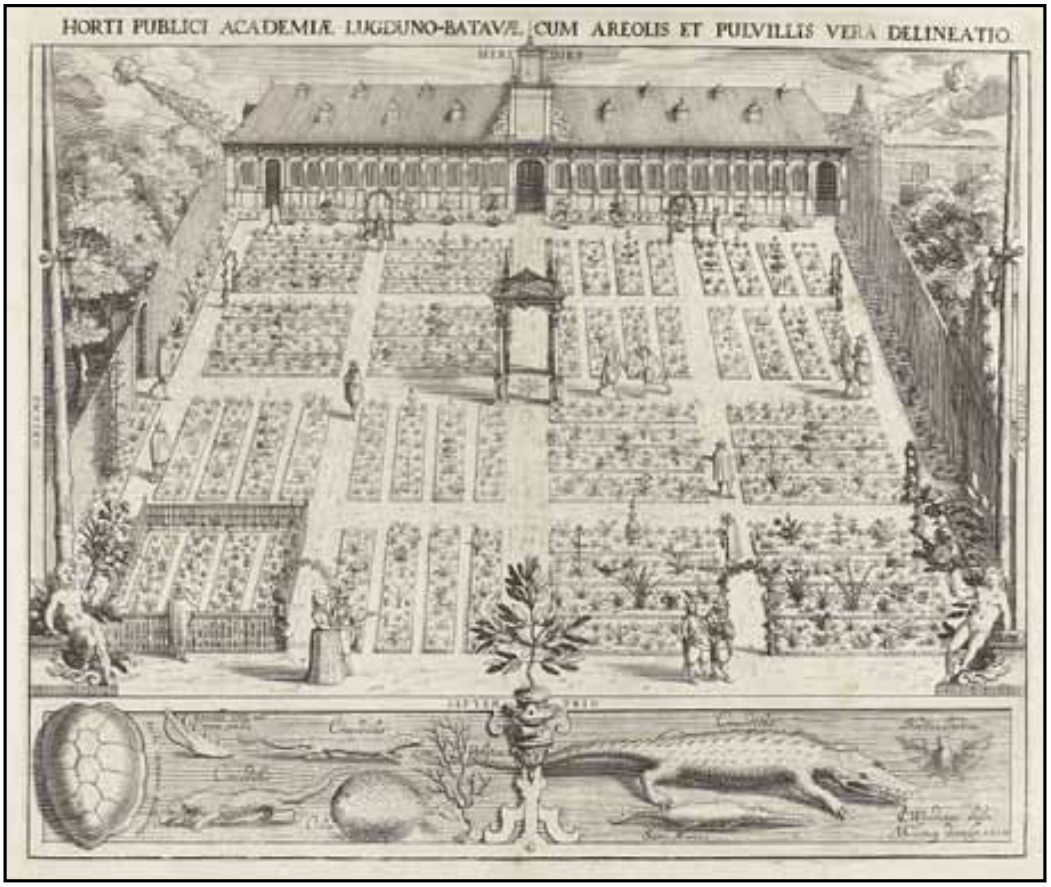
CV

Anthony Gerbino is a historian of early modern architecture in France and England. He received his BA from the University of California at Santa Barbara, an MPhil from the University of Cambridge, and his PhD from Columbia University. His research focuses on the role of architecture in seventeenth-century scientific and academic circles and on the technical and mathematical background of early modern architects, engineers, and gardeners. His more general interests lie in the interaction of art, science, and technology; the professional and intellectual world of early modern artisans; architectural treatises and the culture of the printed book; cartography and its relation to landscape; and the urban history of Paris. He has recently published François Blondel: *Architecture, Erudition, and the Scientific Revolution* (Routledge, 2010) and, with Stephen Johnston, *Compass and Rule: Architecture as Mathematical Practice in England* 1500-1750 (Yale University Press, 2009).

Gregory Grämiger

Reconstructing Order: Architecture, Layout and Plants of the Botanical Garden in Leiden during its First Hundred Years

In 1610 four copper engravings were published in Leiden. They showed the newest spaces erected by the university in the previous decade: its library, the botanical garden, the theatre of anatomy and the fencing school. These institutions played a decisive part in putting the young university into the major league of European academies and formed a complete body of the necessary research and teaching typologies. The garden took a key role in achieving this goal.



Rijksmuseum, Amsterdam

Being one of the world's oldest institutions of this kind, the history of the construction of the *hortus botanicus* in Leiden serves as a good example of why and how early botanical gardens were laid out. Plans for erecting a garden were present since 1587, but it took years to construct it. Some major problems had to be solved. First of all plants had to be acquired. Secondly, the necessary knowledge in the field of botany had to be present in the form of a suitable teacher. Because the field of botany was in formation, it was not easy to fulfill those tasks. After several years the university could appoint the famous botanist Carolus Clusius as professor of medicine and the pharmacist Dirck Outgaerstz Cluyt to be responsible for the actual gardening. These two persons were also in charge of gathering a good stock of herbs and plants, using their private collections and their network

to obtain seeds and bulbs from all known regions of the world. The garden therefore could host from its opening in 1594 onwards a wide range of indigenous and exotic plants. It was primarily used as a teaching device for the students of medicine, but was also open to the general public which soon became fond of the exotic specimens cultivated there. It was therefore both, a special collection in the field of medicine and a public *locus amoenus*.

The spatial layout of the garden was discussed during its establishment. In the end, it was based on an almost quadratic scheme. Completely surrounded by one narrow band of beds, the main area was divided in four similar looking parts which were rotated to each other. These parts (*quadrae*) were then subdivided into smaller groups of again four similar looking areas, formed by three to four stripes each. Their structure resembled the main layout, incorporating similar looking smaller units into the main one. The stripes themselves contained two rows of small beds for the plants. The garden therefore formed a rational and geometrically defined grid in which the plants could be set and found. During the teaching given in the garden a certain bed and therefore a certain species was the topic of the lecture.

Surviving catalogues from different years allow to reconstruct the spatial distribution of the plants. The catalogues were used to make an inventory of the plants and as a teaching

tool for the students during the lectures. Different methods on transforming the spatial grid of the built garden into a paperish counterpart were set up. The inventories show that the grid of the *hortus* was not used in a totally rigid way. Thanks to its spatial layout it was possible to link together different stripes and plots and therefore to establish relations between adjacent plants in different directions. Furthermore, it has to be mentioned that not only scientific considerations could be found in the garden. Aesthetic values and security concerns were also applied in the arrangement of the herbs, trees and flowers.

To protect the most exotic and valuable species during the cold months, a heatable building had to be erected after a disastrous first winter. This simple wooden construction was transformed in 1600 into an elaborated stone building following the wish of the new *praefectus* of the garden, Pieter Pauw, who was also responsible for a new disposition of the plants and for the first printed catalogue of the *hortus*. The building typology and the terms to describe it show a reference to classic role models. But soon the gallery was also used to display exotic animals, minerals and other curiosities gathered from all over the world and it became one of the first public museums in the Netherlands. The exhibits completed the botanical world with its mineral and animal counterparts.

The architecture of the garden took reference to well-known architectural examples. Its high walls not only protected the valuable plants from thieves, but generated also a *hortus conclusus*, a well-known typology of the age. Furthermore, different references were made to interpret the garden as a reconstruction of Paradise, which contained all the botanical creation of God and where Adam first gave all plants their original names. Naming plants was a problem with which all botanists of the time had to deal with.

The other scientific collections printed in 1610 were established at the same time as the garden and took a close relationship to its botanical collection: the library complemented the book of nature present in the garden with the descended wisdom, while the theatre of anatomy with its displayed *memento mori*-like skeletons were important counterparts in the teaching of medicine and of moral justice. Therefore, the collections not only complemented the garden on a scientific level but also on a symbolic one. The collections and their architecture formed an integral system.

CV

Gregory Grämiger, born in 1980, studied architecture at the ETH Zurich. After working as an architect, he is since 2008 a research and teaching associate at the Institute for the History and Theory of Architecture (gta) at the ETH Zurich. He has been teaching elective courses in the history of art and architecture and is writing his doctoral thesis on „The Architecture of Scientific Collections, 1575–1700", focusing on the early library, botanical garden and theatre of anatomy of Leiden University.

Iris Lauterbach

Commerce and Erudition: Bourgeois Self Representation by Botany and Garden Culture in Germany, 16th to 18th centuries

The talk deals with the role of botany and horticulture within the self representation of German cities in the early modern era.

Since its beginnings, botanical research largely depended on international networking, as can be seen since the 16th century in the correspondence and publications of Central European researchers and botanists, for example in the Swiss naturalist Conrad Gesner's publication „De hortis Germaniae" (1561). Commercial contacts and communication among scholars undertaking their research at prestigious Italian universities were crucial to the cultural transference between Italy and Germany that took place from the 16th century onwards in the fields of horticulture and botany. In many descriptions and chronicles of the early modern era, the vegetation and flora are used on a metaphorical level in order to describe the prosperity of the cities. In this civic and urban context, and outside the princely courts in Vienna, Prague, Munich, Stuttgart or Dresden, since the late 16th century horticulture gained importance. The blooming vegetation is shown as a result of a successful city government. Local patriotism is at the origin of horticulture and botany as practised by the citizens and patricians of the Free Cities of the Holy Roman Empire, such as Augsburg, Nürnberg, Frankfurt, or Leipzig. Florilegiums and plant lists refer to certain cities or regions; scientific botany became an instrument of civic selfrepresentation.

Fig. 1: Johann Lösel, *Plantas in Prussia*, Königsberg 1654, frontispiece

Physicians and apothecaries from the cities who had studied at the famous European universities in Italy or in France were interested in the therapeutic properties of the plants and therefore were often excellent botanists. Among other examples the talk will focus on the Volkamer family from Nürnberg, whose members were successful merchants and

physicians dealing and networking with many learned naturalists all over Europe. Johann Christoph Volkamer's publication on the fruits and the cultivation of citrus („Nürnbergischen Hesperides", 1708-1714) is the result of the botanical research of a rich merchant and passionate amateur establishing horticulture and the cultivation of the citrus in praise of his native city Nürnberg.

Fig. 2: Cedro col pigolo/Schloss in Oberbürg bei Nürnberg, in: Johann Christoph Volkamer, *Nürnbergische Hesperides*, vol. 1, Nürnberg 1708, pl. pag. 122

CV

Iris Lauterbach studied art history, French and Italian philology at the universities of Mainz, Pavia (Collegio Ghislieri) and Paris (Paris IV); 1985 PhD, dissertation on French gardens in the second half of the 18th century; 1986-1987 assistant curator at the Staatliche Museen Preußischer Kulturbesitz Berlin; 1987-1989 assistant teacher at the Institute of Christian Archaeology, Albert-Ludwigs-Universität Freiburg im Breisgau; 1989-1991 postgraduate fellow at the Bibliotheca Hertziana, Rome (Max-Planck-Institut); since 1991 she is a member of the research department of the Zentralinstitut für Kunstgeschichte, München; since 2001/02 she also teaches garden history at the Institute of Landscape Architecture at Munich Technical University.

Her fields of research are European garden history from the 16th to 20th centuries, architecture and the visual arts in National Socialism, and cultural policy in postwar Germany (1945-1949).

Michael Leslie

The Uneasy Paradise: Why Couldn't John Evelyn Complete the Elysium Britannicum?

The manuscript of the *Elysium Britannicum* is extraordinary and almost painfully expresses John Evelyn's struggles to create, correct, and reorganize what he hoped would be a masterwork on gardens and gardening. His difficulties and dissatisfactions are evident on page after page, recognizable even in facsimile but even more powerful when the original manuscript is seen.

The *Elysium Britannicum* is a fascinating phenomenon both for what Evelyn writes and for what he either doesn't write, or doesn't complete, or chooses to delete. Its unique character is very much a product of its author's confrontation with his 'moment', or rather his 'moments': first, the intellectual, political, and social circumstances in which Evelyn embarked on its creation and then the long period, effectively 50 years, in which those circumstances changed, and changed again, as he attempted to revise and complete the work. In one sense, the *Elysium Britannicum's* greatest interest lies in the fact that it is a failure, remaining unprinted until the end of the twentieth century.

Understanding the phenomenon of the Elysium requires us to explore a wide, varied, and interlocking range of contexts. These include:

> The project's origins in particular histories of garden and plant writing; the work's uneasy status as those traditions changed and were superseded. The framing expectations for garden writing were revised or discarded.
>
> The rapidly-changing status of the concept of the garden as a scene or a key 'place' in the life of an individual or a society.
>
> Challenges to the stability of framing political and religious ideas and myths, which were crucial to the 'imaginary' of the author and his contemporaries.
>
> Profound changes to concepts of knowledge and epistemology, and the physics that underlay both.
>
> And consequent changes to attitudes to the dissemination of knowledge.

John Evelyn embarked on what he surely believed would be his magnum opus at a time when all the social, religious, and political certainties of his youth had been overturned. His attitudes and *mentalité* had been formed by those certainties; and the creation moment of the Elysium was one in which he was faced with the possibility that it would be necessary to sweep aside the shattered fragments and embrace ideas and attitudes

incompatible with the world he had lost. Evelyn's identity was profoundly entwined with his social status and political affiliations. The raw and unwelcome new environment of the British Civil Wars and their republican aftermath was one in which neither he nor his attitudes to knowledge were likely to flourish.

The knowledge network into which he found himself thrown by the outcome of the Civil Wars was one in which he was emphatically an outsider, uneasy and unwilling. The high ground of plant science, garden writing, and agriculture was occupied not by members of his own social group, but by a diverse cast of characters who prized 'ingenuity' often without regard to social origins or status, or with much reverence for tradition. Even after the monarchy returned in 1660, the world of knowledge in which he found himself was one that had embraced (often reluctantly and to some degree deliberately obscurely) attitudes to gardens, the physical world, and knowledge itself that he found inimical.

Evelyn wanted to be accepted into the ranks of the ingenious, even though he hankered for an earlier world that posed fewer challenges to his cherished notions of society, state, and church. His role in the deliberations and publications of the Royal Society displays the tensions: though *Sylva*, the Society's first publication, was largely coordinated by him, his own contributions looked back insistently to the classics as the source of authority, even though his fellow authors increasingly gave prominence to experiment and observation. Evelyn showed considerable interest in practically-derived knowledge, but he was always reluctant to let go of an appeal to the traditional authority of a late humanist education. It is instructive to compare Evelyn with his younger contemporary Nehemiah Grew (c. 1641-1712), whose *Anatomy of Plants* (1682) displays an utterly different attitude to plant physiology, or the botanist Stephen Hales (1677-1761) of the next generation.

Nehemiah Grew was the son of a distinguished Dissenting minister, and his religious non-conformity contrasts with Evelyn's intense commitment to the established Church of England. This contrast leads directly into Evelyn's problems with the Elysium. To what degree could the pursuit of knowledge be divorced from acceptance of the doctrines of Anglicanism, Christianity more widely, and the traditional values of the central Western philosophical tradition?

For Evelyn, these questions had been posed most powerfully in the period immediately before he began composing the *Elysium*. A friend of Walter Charleton (1619-1707), Evelyn more than dabbled in the ideas of Epicurus, newly fashionable in Europe in the first half of the seventeenth century. Epicureanism's bracing scepticism suited a period in which apparent certainties of politics and religion had been overturned; and Epicurean theories of the atomic nature of the physical world exercised a powerful attraction. Evelyn translated the first book of Lucretius's *De rerum natura*, commenting with a carefully calculated Epicurean playfulness and no serious resistance to the atheist implications; and Evelyn

was lightly disguised by the name of Lucretius, spokesman for Epicureanism, in Charleton's *The Immortality of the Human Soul Demonstrated by the Light of Nature* (1657).

Evelyn was not alone in being attracted to the logic of Epicureanism's explanations, while also responding fearfully and defensively when the implications became unavoidable (Robert Boyle, his friend, fellow-scientist, and fellow member of the Royal Society, suffered equally from anxiety about the embrace of corpuscularianism). Evelyn's response also coloured his attitude to the dissemination of knowledge: throughout his life he resisted the broadening of the availability of knowledge to all kinds and classes of men, seeking to preserve modes of communication that restricted access to those of his own class. In this he was once more at odds with the very societies of which he was a member. The tension was one he never resolved and the *Elysium Britannicum* is its monument.

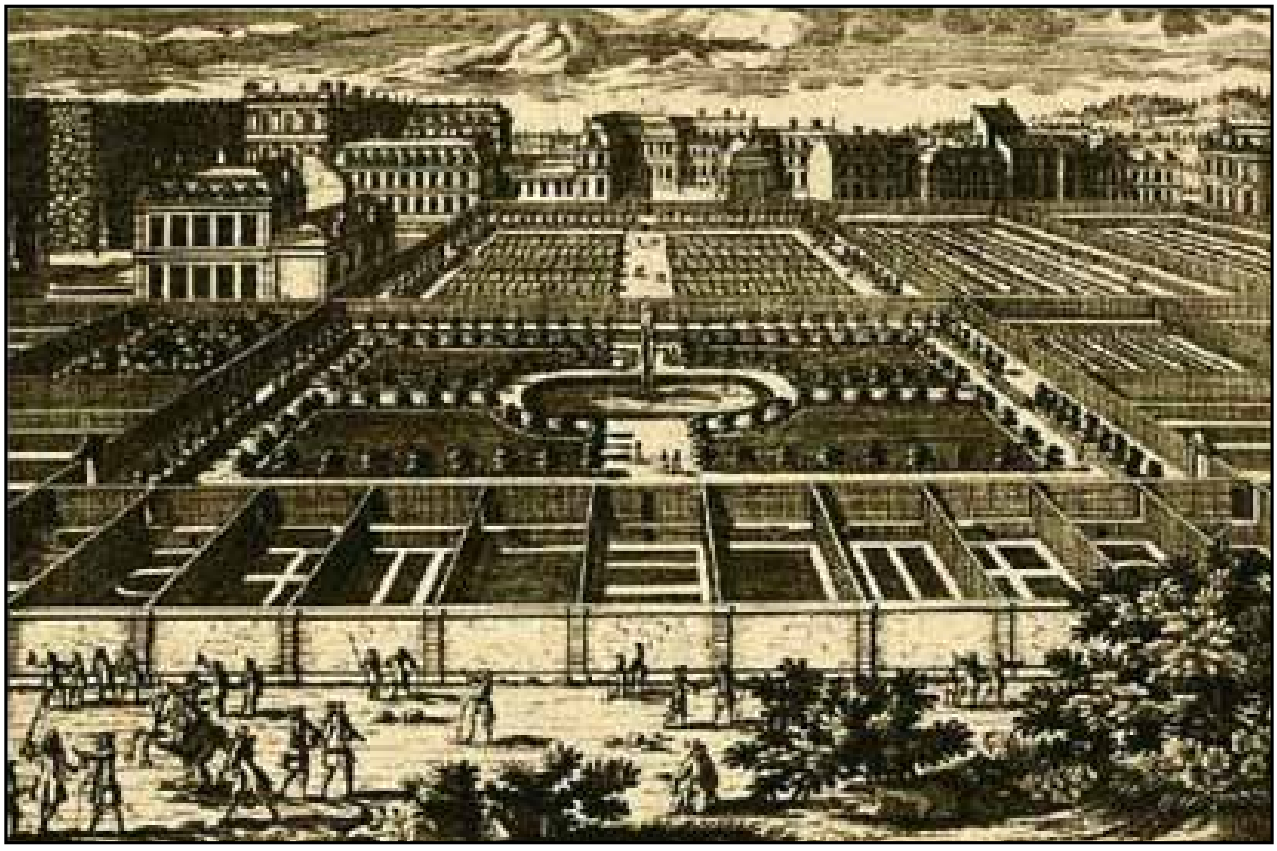
CV

Michael Leslie was educated at Leicester and Edinburgh Universities, and he has taught at Bedford College, University of London, Sheffield University, and Rhodes College in Memphis, Tennessee, where he is now Professor of English and Dean of British Studies. His book, *Spenser's „Fierce Warres and Faithfull Loves": Martial and Chivalric Symbolism in „The Faerie Queene"*, was published in 1984; an edited collection, *Culture and Cultivation in Early Modern England: Writing and the Land* appeared in 1992; another, *Samuel Hartlib and Universal Reformation: Studies in Intellectual Communication* was published in 1994. He was a founding assistant editor of the *Journal of Garden History* (now *Studies in the History of Gardens and Designed Landscapes*) and co-editor of *Word & Image: A Journal of Verbal/Visual Enquiry*. In 2003-4 he was founding section editor for the seventeenth century of the internet-based resource, Literature Compass. In 1987 he founded and was thereafter Director of the Hartlib Papers Project, to edit and publish the surviving papers of the seventeenth-century polymath Samuel Hartlib, the fruits of which were issued on two CD-Roms in September 1995 as *The Hartlib Papers: A Complete Text and Image Database of the Papers of Samuel Hartlib (c.1600-1662)* (second, enlarged, edition, 2002; third online edition appearing shortly); and in 2010 he published editions of two plays by the forgotten seventeenth-century dramatist Richard Brome – *The Weeding of Covent Garden* and *The New Academy* – as part of an entirely web-based complete edition of Brome's works (http://www.hrionline.ac.uk/brome/). He was a Senior Fellow in Landscape Architecture at Dumbarton Oaks (Harvard University) in Washington D.C. from 1996 to 2002 (chairing the Committee of Senior Fellows in Landscape Architecture, 1998-2002). Early 2013 will see the publication of the 6-volume *Cultural History of Gardens*, of which he is co-Senior Editor, editor of the volume on the medieval period, and contributor to three volumes.

Chandra Mukerij

The Potager du Roi and the Garden of the Sun King

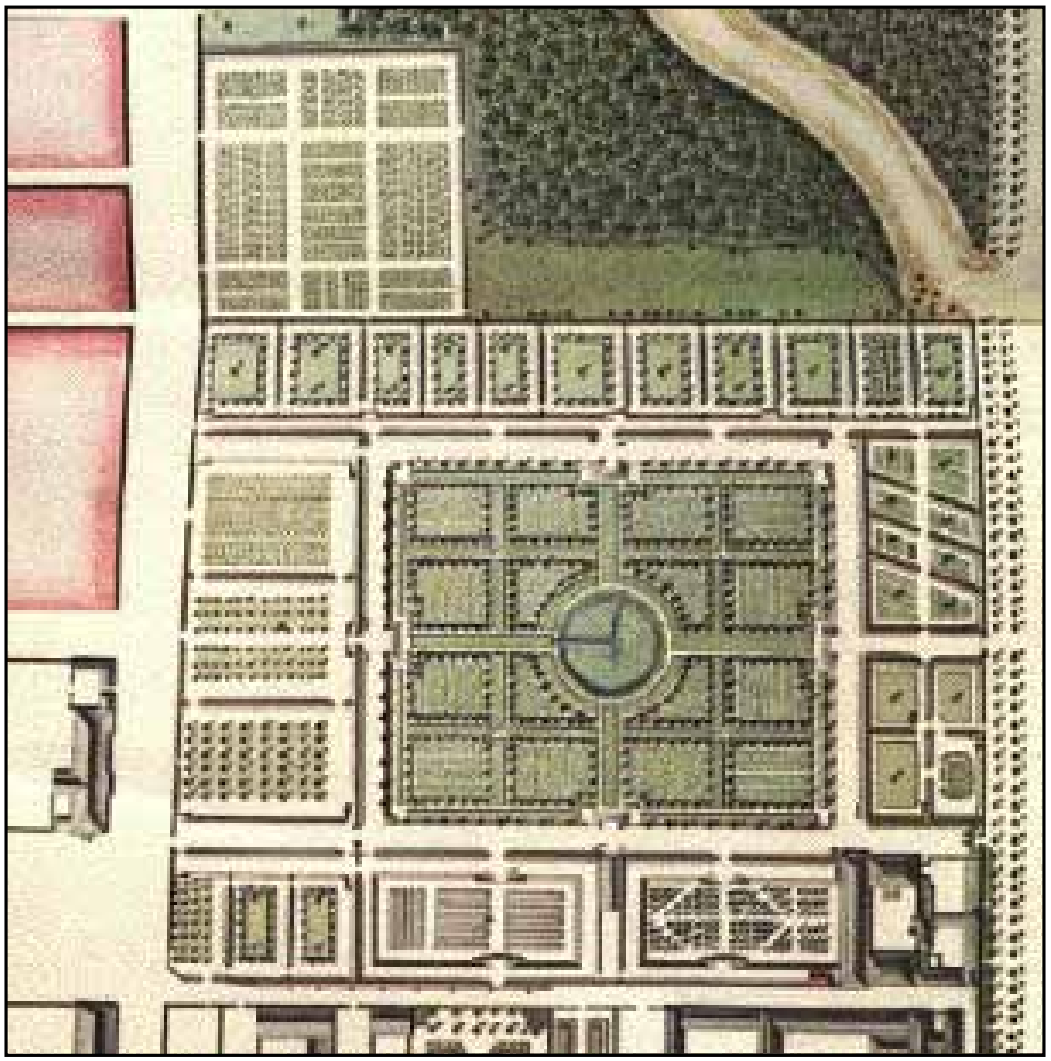
Gardening at the *potager du roi* at Versailles, the kitchen garden for Louis XIV, was a site of experiments in botany and horticulture under the supervision of Jean de la Quintinie. The experiments were important because the kitchen garden at Versailles was not only to provide food for Louis XIV and his court, but to be a source of wonders, marvels and surprises not only to please a demanding monarch, but help promote his standing as a semi-deity, the Sun King.[1] To this end, the *potager du roi* was designed to use the sun for maximum effect. It was a sunken garden with thick walls, glass-covered hot beds, and fabric coverings for trees set against warm walls, creating micro-climates in which rare exotic species could thrive in a cold valley of northern France and delicacies like peas, for example, could be forced to grow earlier in the spring than they did even in the warmer Mediterranean region.[2]



1 Jean de la Quintinie, *Instructions Pour Les Jardins Fruitiers Et Potagers* (Amsterdam: Henri Desbordes, 1692).

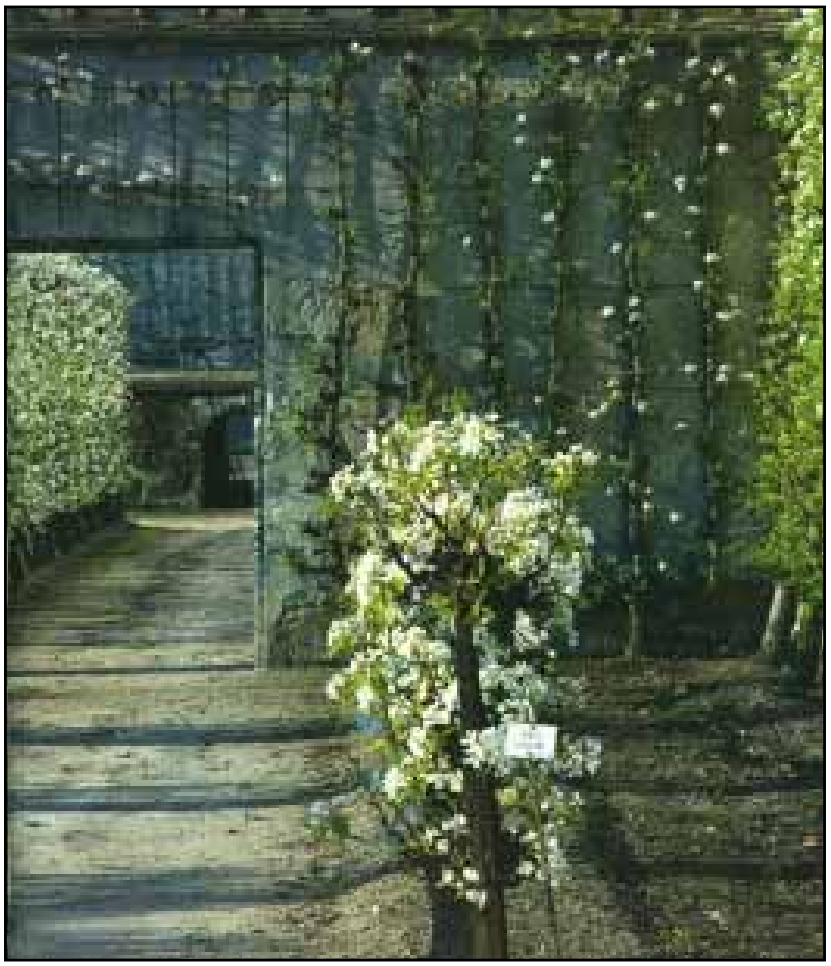
2 Chandra Mukerji, *Territorial Ambitions and the Gardens of Versailles*, Cambridge Cultural Social Studies (Cambridge; New York: Cambridge University Press, 1997).

The garden at Versailles as a whole was symbolically organized around the equation of Louis XIV with Apollo, the Sun King, and thematic designed as an Olympus, a world apart from the ordinary. This symbolism positioned Louis XIV as superhuman, but also a natural force that brought light and heat to the world. In histories of the French garden, the *petit parc* or formal garden at Versailles is generally analyzed as separate from the *potager du roi.* But the *potager* was explicitly included in the king's itineraries for formal promenades by foreign visitors to the court. In his eyes, it was continuous. And I want to argue that this was in part because of the importance of the sun's powers to the experiments in the kitchen garden.



For this reason, I want to look at the experiments with heat and glass in the *potager du roi* at Versailles as an extension of the political symbolism of the garden as a whole. Gardening itself had political meaning, demonstrating the king's effectiveness as steward of his kingdom –his duty as part of man's Christian duty for stewardship over Creation. Making plants flourish and be abundant was the definition of stewardship, and exactly what the gardens at Versailles continually demonstrated. At the same time, the *potager* was built like a fortress, turning wall systems used for military purposes into heat sinks, linking

France's military power to its capacity for stewardship. And experiments in the *potager* had an additional capacity for demonstrating Louis XIV's superhuman powers as a Sun King to the extent that they used the sun to make "nature" more abundant. Scientific experiments in this part of the garden, then, were both a form of caring and a use of nature for the expression and expansion of royal power.[3]



The stewardship practices in the gardens were developed from French and Dutch gardening literature and market gardening practices brought to Versailles and perfected by La Quintinie. He took techniques of horticulture used by market gardeners and outlined in *mesnagement* literature about estate management, and pushed these natural experiments even farther. Market gardeners were already concerned with bringing fruits and vegetables to market earlier than other sellers and raising the rare exotics for which they could get the highest prices and attract the most elite customers. But fruits and vegetables at the court of Louis XIV had to be even more wonderful and exotic. La Quintinie collected multiple kinds of fruit trees to create a diversity of tastes and feed the court with sweet delicacies over a longer season. To make this work, and manage the fruiting time of trees

3 Chandra Mukerji, „Material Practices of Domination and Techniques of Western Power," in: *Theory and Society* 31.1 (2002).

and vegetables, La Quintinie used the heat of the sun captured in walls, earth, and glassed boxes to create micro-climates while protecting plants from pests.[4]

The experiments in capturing the heat of the sun in the *potager du roi* had effects on plants, but also important political value. La Quintinie was given the budget to use so much glass because the glittering garden, reflecting the sky, served the representation of the king as Apollo. Reflecting and using the sun ingeniously was an important element of the park as a whole. The *Grotte de Versailles*, the early garden feature that linked Louis XIV to Apollo, was famously described by Félibien as reflecting the setting sun. The gates at the entrance of the grotto were gilded and had lines radiating from an image of the sun containing a portrait of the young Louis XIV. The grotto was turned in such a way that sometimes the setting sun would catch it, and the gates would start to glow brightly.[5] Creating reflections of the sun in the garden was important elsewhere. It contributed to the beauty and significance of the *Parterre d'eau*, and many other fountains. In fact, the fountains at Versailles were typically reflecting ponds with jets more layered basins of water in the Italianate style, and this provided opportunities in the garden to see reflections of the heavens embedded in the king's lands. Significantly, when the grotto at Versailles had to be torn down to expand the chateau, it was replaced by the Hall of mirrors—the other site at Versailles besides the *potager* with large expanses of glass.[6]

It is in this context that we can begin to see the experiments in forcing plants to fruit early and growing exotics on French soil as more than botanical and horticultural works of finesse. The method of experimentation in horticulture employed by La Quintinie fit and served the political theme, equating Louis XIV with Apollo. La Quintinie took ideas about the use of glass from Olivier de Serres,[7] who wrote about gardening as stewardship and tried to push techniques of market gardeners for his patron, Henri IV. La Quintinie simply pushed the experiments in gardening and politics on a grand scale, creating a world of light and heat befitting the garden of the Sun King. He demonstrated the power of the sun at Versailles, and while providing the court with delicacies to eat, also confirmed the political equation of Louis XIV with Apollo.[8]

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4 Mukerji, *Territorial Ambitions and the Gardens of Versailles*.

5 André Félibien, *Description De La Grotte De Versailles* (Paris: S. Mabre-Cramoisy, 1672).

6 Mukerji, *Territorial Ambitions and the Gardens of Versailles*; Quintinie, *Instructions Pour Les Jardins Fruitiers Et Potagers*; Jean-Marie Apostolidès, *Le Roi-Machine: Spectacle Et Politique Au Temps De Louis XIV* (Paris: Editions de Minuit, 1981).

7 Olivier de Serres, *Le Theatre D'agricvltvre Et Mesnage Des Champs* (Paris,: I. Métayer imprimeur ordinaire du roy, 1600).

8 Chandra Mukerji, „Space and Political Pedagogy at the Gardens of Versailles," in: *Public Culture* 24.3 (2012).

In this paper, I will look in more detail at the collection of plants and methods of horticulture used in the *potager du roi* to see how knowledge of the natural world was put to political use, and how experiments in harnessing the power of the sun through horticulture were conducted to this end.

Bibliography:

Apostolidès, Jean-Marie. *Le Roi-Machine : Spectacle Et Politique Au Temps De Louis XIV*. Paris: Editions de Minuit, 1981.
Félibien, André. *Description De La Grotte De Versailles. Paris*: S. Mabre-Cramoisy, 1672.
Mukerji, Chandra. „Material Practices of Domination and Techniques of Western Power", in: *Theory and Society* 31.1 (2002): 1-31.
---. „Space and Political Pedagogy at the Gardens of Versailles." *Public Culture* 24.3 (2012): forthcoming.
---. *Territorial Ambitions and the Gardens of Versailles*. Cambridge Cultural Social Studies. Cambridge ; New York: Cambridge University Press, 1997.
Quintinie, Jean de la. *Instructions Pour Les Jardins Fruitiers Et Potagers*. Amsterdam: Henri Desbordes, 1692.
Serres, Olivier de. *Le Theatre D'agricvltvre Et Mesnage Des Champs*. Paris,: I. Métayer imprimeur ordinaire du roy, 1600.

CV

Chandra Mukerji is Distinguished Professor of Communication and Science Studies at the University of California, San Diego. She is author of several books on materiality, culture and power, including *From Graven Images: Patterns of Modern Materialism* (1983), *Territorial Ambitions and the Gardens of Versailles* (1997), and *Impossible Engineering: Technology and Territoriality on the Canal du Midi* (2009). The last is co-recipient of the 2012 American Sociological Association Distinguished Book Award.

Katharina Peters

‚From Seeing to Science' or ‚Learning by Doing' – Discovering and Sharing Botanical Knowledge in the 19th Century (Looking at the Hanoverian Berggarten)

"During the period of his stay he visited lectures on natural history, botany, cryptogamia, physics, pure and applied mathematics, geometry, logic, oeconomia and geografia, with outstanding diligence and attention [...], and [...] was laudable and exemplary".[1] This is the way it has been written in the testimonial of the Hanoverian court gardener Heinrich Ludolph Wendland (1792-1869) issued by the University of Göttingen in 1819. Before studying in Göttingen, Wendland served his apprenticeship as a gardener and further improved his skills by working as an assistant in distinguished gardens like the botanical gardens in Vienna and Kew (London). After having finished his scientific studies Heinrich Ludolph Wendland was expected in his birthplace Herrenhausen by the governance of King George III. (1738-1820) to follow in his father's footsteps as court gardener of the royal botanic Berggarten.

Fig. 1: View of the historical and current landmark of the botanical Berggarten. In former times, the pavilion contained the scientific memory of the Royal Gardens of Herrenhausen: The 'Royal Garden Library Herrenhausen' (Königliche Gartenbibliothek Herrenhausen) (Foto: Sophie von Schwerin)

1 Gottfried Wilhelm Leibniz Bibliothek/Niedersächsische Landesbibliothek, Nachlass Wendland, Noviss. 452,2,1,6, *Zeugnis der Universität Göttingen für Heinrich Ludolph Wendland, 1819.*

At that time, the royal botanic Berggarten had already come to fame because of its extraordinary scientific research in the field of botany. However, contrary to common practice this botanic garden was not the result of the endeavours of a scientist or, to be precise, a botanist[2], but the tradition of collecting foreign plants at the site of the Berggarten and conducting significant botanical research was due to a gardener named Johann Christoph Wendland (1755-1828). He did not have a fundamental academic education like his son Heinrich Ludolph Wendland, but he found his own way to accumulate substantial botanical knowledge and carried out groundbreaking morphological and methodical studies in regard to the exotic plant collections.

Taking into account the copious estate of the Wendland family and especially the 'Royal Garden Library Herrenhausen' (Königliche Gartenbibliothek Herrenhausen)[3], which was recently opened to the expert audience and analysed by an extensive research program of the Centre of Garden Art and Landscape Architecture (CGL) at the Leibniz Universität Hannover in cooperation with the Gottfried Wilhelm Leibniz Bibliothek Hannover, the presentation will focus on how Johann Christoph Wendland, his son Heinrich Ludolph Wendland and afterwards his grandson Hermann Wendland (1825-1903) took their paths from pre-professional autodidacts to distinguished scientists and carried out their extraordinary professional careers.

It will tell a story of professionalization and scientification and also a fascinating story of bringing to life a botanical garden as probably one of the closest ties between garden culture and natural sciences.

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2 Cf. the definition of 'botany' and the reference to the interpretation of Carl von Linné (1707-1778) in: Gerhard Wagenitz, *Wörterbuch der Botanik*, Nikol Verlag, Hamburg, 2008[2], p. 50f. Cf. also the opinion of Albert Dietrich, who states that no gardener could be a real scientist because he may be fully engaged with garden culture; but Dietrich admits that someone who may assemble genius, erudition and practical efficiency could at least work successfully in science and in garden culture. Albert Dietrich, *Botanik für Gärtner und Gartenfreunde. Erster Theil: Allgemeine oder theoretische Botanik*, Verlag von Friedrich August Herbig, Berlin, 1837, p. 12f.

3 'The Royal Garden Library Herrenhausen' (Königliche Gartenbibliothek Herrenhausen KGBH) is the former research library of the Hanoverian court gardeners. Once resulting from the private library of Johann Christoph Wendland and acquired by the government at the end of the personal union between the Kingdom of Great Britain and the Kingdom of Hanover, it includes a unique collection of horticultural, botanical and architecturally writings: 691 printed books and 51 bundles of handwritings, drawings plus herbariums. In 2007 the KGBH was transferred into public property and important parts of it were accommodated at the Gottfried Wilhelm Leibniz Bibliothek Hannover. With generous funding from the Lower Saxony Ministry of Science and Culture, the KGBH had been well-arranged and analysed in terms of the Berggarten and the court gardener's scientific work (cf. Heike Palm, Geschichte der Sammlung "Königliche Gartenbibliothek Herrenhausen", in: Hubertus Fischer, Georg Ruppelt and Joachim Wolschke-Bulmahn (eds.), *Königliche Gartenbibliothek Herrenhausen. Eine neue Sicht auf Gärten und ihre Bücher*. Sonderband 104 of the Zeitschrift für Bibliothekswesen und Bibliographie, Vittorio Klostermann, Frankfurt am Main, 2011, p. 19-64).

At the beginning, the presentation will focus on the history of the royal botanic Berggarten as a scientific garden. Particular attention will be dedicated to the learning process of the three generations of the Wendland family, which were entrusted with the care for the precious plant collections in Herrenhausen for 125 years and transformed this garden into one of the most eminent botanical gardens in the whole world at that time, with specific emphasis on the Ericaceae, Fabaceae, Orchidaceae, Arecaceae and Bromeliaceae.

The presentation will lead to the converging points between garden culture and knowledge and, for example, analyse the meaning of the scientific observations and botanical illustrations by Wendland the Elder, plunge into the science circle of the second Wendland to understand why science is always also a social activity, and, for instance, follow the youngest Wendland on his expedition to Central America to learn about the origin of knowledge and science.[4]

Fig. 2: *Pitcairnia latifolia*, detailed drawing by the court gardener Johann Christoph Wendland (1755-1828) (Johann Christoph Wendland, *Hortus Herrenhusanus seu plantae rariores quae in horto regio Herrenhusano prope Hannoveram coluntur*, Hahn, Hannover, 1801, Tab. III; Gottfried Wilhelm Leibniz Bibliothek/Niedersächsische Landesbibliothek, KGBH 601:2)

4 Hermann Wendland reached Costa Rica in 1856 where he got the opportunity to closely observe the local vegetation. This exact study of plants has always been the essence of botanical science. 'From seeing to science' describes the way of how knowledge is to be gained. The German term 'Wissenschaft' (science) comes from the Old High German word 'wizzan', which means 'gesehen haben' (to have seen) (cf. Matthias Jakob Schleiden, *Die Pflanze und ihr Leben. Populäre Vorträge*, Wilhelm Engelmann, Leipzig, 1850[2], p. 17; Brockhaus (ed.), *Brockhaus Enzyklopädie*, vol. 30, F. A. Brockhaus, Leipzig Mannheim, 2006[21], p. 200).

The example of the royal botanic Berggarten and its court gardeners Wendland will lead to general investigations in regard to the impact of knowledge in the gardener's profession. Therefore, we will see that knowledge is not only a means to an end.

Fig. 3: Even in the mid-19th century the vegetation of the magnificent conservatory imitates a tropical world and stands for the substantial botanical knowledge of the court gardeners at Herrenhausen (unproven reprint in: Karl-Heinrich Meyer, *Königliche Gärten. Dreihundert Jahre Herrenhausen*, Fackelträger Verlag, Hannover, 1966, p. 225)

CV

Katharina Peters, born in 1978, completed training as a landscape gardener and received her degree in landscape architecture from the Leibniz University Hannover. Between 2009 and 2011 she obtained a Ph.D. grant from the Lower Saxony Ministry of Science and Culture as part of the (still continuing) research project 'The Royal Garden Library Herrenhausen' (Königliche Gartenbibliothek Herrenhausen), which was realised by the Centre of Garden Art and Landscape Architecture (CGL) at Leibniz Universität Hannover in cooperation with the Gottfried Wilhelm Leibniz Bibliothek Hannover. Her studies referred to the court gardeners at Herrenhausen considering the botanical efforts of the court gardeners Wendland. Currently she works as a landscape architect and creates private gardens.

Carola Piepenbring-Thomas

**Garden Visits, Observation, Reading and Excerpt –
Martin Fogel (1634–1675) of Knowledge Acquisition Techniques**

The Hamburg physician Martin Fogel exemplifies the polymath of the 17th Century. Scholarship meant at that time not only the completion of studies, the care of numerous contacts and relationships with scientists in different countries. Often it also involved a voluminous correspondence and multilingualism and it meant a broad interest in various scientific disciplines. Introduced to natural history studies by his teacher Joachim Jungius, Fogel devoted his special attention not only to historical, geographical, medical and other questions but also to natural, botanical and garden issues.

Martin Fogel was born in 1634, the son of Martin and Judith Fogel, merchants in Hamburg. He graduated from the grammar school and studied theology at Giessen and Strasbourg. After returning to Hamburg, he taught various subjects including oriental languages. Having been appointed one of the estate executors of his teacher Jungius, he organized his handwritten papers. After that he worked for four years on the edition of the "Doxoscopiae". This is one of the most important works of the polymath Jungius. In the course of his four-year educational tour he graduated as doctor of medicine in Padua. Back in Hamburg he settled down as a physician. In 1675 he was appointed professor of logic at the Academic Gymnasium.

Although he probably did not have his own garden, Martin Fogel was highly interested in gardens and horticulture. He visited the garden of the Anckelmanns in Hamburg, the Gottorf garden in Schleswig and visited not only famous libraries, art rooms and buildings but also many famous gardens on his journey e.g. in Italy, France and Spain. In his diary he recorded impressions, descriptions and evaluations of these gardens and vivaria, including observations on the vegetation of the countryside, cultivation and the use of various plants. Later in Hamburg Fogel found enough time, in addition to his professional life, for experiments and observations (e.g. the color changes in Larkspur). He noted the results in a card index system and above all, he managed to collect an extraordinary library (3,600 volumes). Fogel classified about 120 works as botanical, other books he classified as the medical reference books. The travel diary, the card index system and his library are the primary sources for information on Fogel's acquisition of botanical knowledge and its organization.

After he died in 1675, at the age of 41 years, a catalog of his *library* was published for an auction. Fortunately, Gottfried Wilhelm Leibniz convinced the Hanoverian Duke Johann Friedrich of the quality of the collection and commissioned the purchase of the entire library for 2,000 thaler. In 1678 the whole library was transferred to Hanover. Today the collection of books is no longer complete because of duplicate changes with other libraries, but the botanical books habe only been slightly affected.

Even a small selection of authors shows the breadth of Fogel's collection: Cesalpinus, Ursinus, Camerarius, Bauhin, Morison, Parkinson, Ray, Royer, etc. The examination of the books and their contents and their subdivision into 14 groups shows that Fogel was less a bibliophile than a very systematic collector. The selection of books reveals a methodical understanding of the subject. It also provides an insight into the spectrum of botanical literature, which was available for the interested reader in the second half of the 17th century. Fogel received English, Italian, French and Dutch works. He used his books for intensive studies, annotated and excerpted relevant information. He placed special emphasis on the use of a unique terminology. Trained by the work on the edition "Doxoscopiae" of his mentor, he paid special attention to using logical and systematic distinctions between substantial and accidental characteristics to describe a plant. Fogel owned books by Pliny and Theophrastus, herbal books, works about vernacular plant names, locations and about living conditions, the arrangement and design of gardens, planting instructions for the gardener with illustrations of useful gardening tools. He also had many works on local flora, plant lists from botanical gardens, commercial catalogs, books with microscopic images, and finally the first publication on a single plant family, the Compositae.

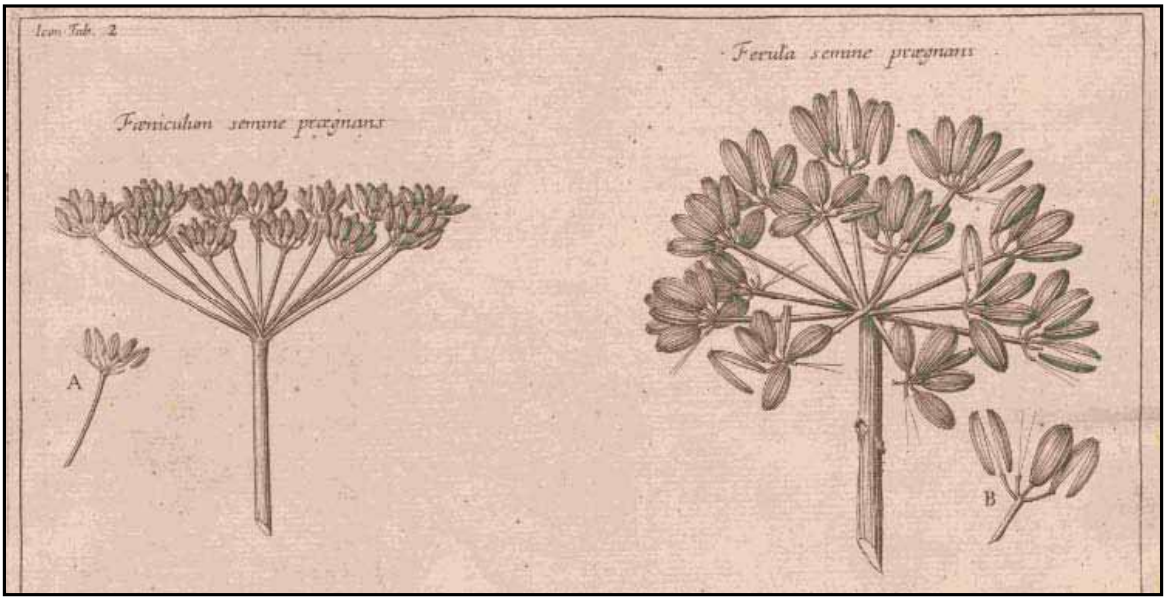

Fig. 1: Detail from Morisons monograph. (Robert Morison: Plantarum Umbelliferarum Distributio nova. Oxford: Theatrum Sheldonianum, 1672. GWLB: 10048)

Also his *card index system* shows Fogel's interest in botanical questions. In more than 20 years he collected approximately 32,500 sheets in octavo format. Of course the collection includes not only excerpts and notes on plant science, but countless further notes on his other special fields of interest. About 800 botanical sheets cover notes about plant structure, plant cultivation, etymological observations for plant names, and notes on authors and their works, notes on the use of individual plants and their fruit, on prices (especially of wood), on the geographical presence of plants (from published travelogues) and on fossillized plants. But most of the papers concern single observations of plants, their fruits, roots and seeds.

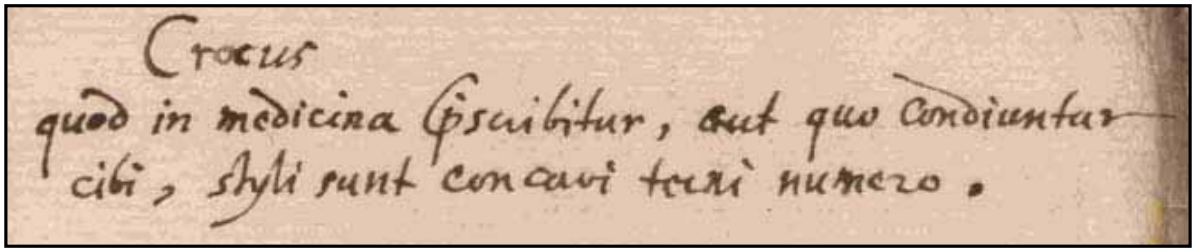

Fig. 2: Detail of a note on the medical use of Crocus. (GWLB: Ms XLII 1923, sigma 15 (fol. 3r))

Gardens are mentioned only sporadically, for example because of remarkable plants (lilies, tulips). Fogel used numerous sources for his notes: oral communications, letters and newspapers, but mostly he worked with his library. He excerpted and listed the authors and their works with abbreviations to identify them. For this the originals and Fogel`s work can be reconstructed. Fogel organized his notes in similar fashion to his library, but he used different categories. He developed his index only on individual subjects of interest to him and not with the ambition of systematic completeness.

Finally, the *travel diary* gives an insight into the educational grand tour of Martin Fogel (1662-1666). About 800 sheets of paper recorded the journey he undertook with the Hamburg merchant's son Martin Wevetzer. They visited well-known scholars, who sometimes functioned as a „guide". Fogel noted in his diary details about the famous gardens, inscriptions, descriptions of landscapes, monasteries and villages, records of the visited manufactories, libraries and universities.

The library, the card index faciliy and the travel diary, as sources, are only at the beginning of their scientific and scholarly evaluation. The presentation will provide a detailed insight into the rich material base and an introduction to Fogel's methodological practice.

CV

Carola Piepenbring-Thomas was born in 1961, studied fine arts, history and philosophy in Aachen and Hanover, and obtained a PhD in 2008. Since 2006 C. Piepenbring-Thomas has been scientific assistent in the manuscript department of the Gottfried Wilhelm Leibniz Library in Hannover. Her academic interests are Urban Administration and Legal History of the 16th Century, history of books and palaeography, cultural and scientific history. Publications and Presentations include: *Leibniz as a librarian, the collection of the libri botanici Martin Fogel* (2009); *The law in the city of Hanover. Documented Enforcement of rules* (2010); *The card index system of Martin Fogel* (2010). Current scholarly work involves the processing of libraries of scholars of the 17th Century in connection with the virtual reconstruction of the working library of Gottfried Wilhelm Leibniz (DFG project GWLB) and the publication about *Epistemological methods of the organisation of knowledge in the 17th Century: The library and the card index system of the Hamburg physician Martin Fogel* (2010-2012).

Denis Ribouillaut

Measuring Time in the Gardens of Papal Rome

Many gardens in early modern Europe featured sundials or *meridiane* along with ancient statues and elaborate fountains. The presence of these devices for measuring time and space is an eloquent illustration of the idea that the early modern garden was an area for the demonstration of sciences, as gnomonics was itself a branch of mathematics. Most mathematical treatises in the sixteenth century have a chapter on gnomonics: Apian, Münster, Oronce Fine, Clavius, Salomon de Caus, etc. The *gnomon* was also instrumental in practical geometry, for surveying, building geographical and chorographical maps, laying out streets and the main boundaries of territories. In short, it was a pivotal instrument of local, yet cosmic measurement of time and space, both an instrument and symbol of power.

The interest for such instruments during the Renaissance is closely linked with ancient Roman science. Vitruvius dedicates an entire chapter to gnomons and sundials in his treatise on architecture, which also contains instructions for making hydraulic machines. Both these devices are present in the Renaissance garden. They were meant to advance the knowledge of the world and to provoke wonder, whilst celebrating the owner of the garden for having created such marvelous artifices. Especially important from a historical point of view is the link of these instruments with the practice of astrology on one side and with the reform of the Julian calendar on the other. From an etymological and philosophical point of view, the sundial or *gnomon* designates that which understand, decide, judge, distinguish (Michel Serres). It is fundamentally linked with a theory of knowledge. Plato's allegory of the cave and his metaphor of the sun are linked with the way astronomers interpreted and measured the universe by means of the cast of a shadow.

Despite the vast literature in gnomonics, the form, function and meaning of these scientific instruments and the reasons why they were displayed in gardens have never been fully addressed. In this paper, I will present new research which seeks to investigate the importance of these devices in the symbolic and scientific economy of the early modern garden, focusing on the gardens of papal Rome.

The first part of the paper will be dedicated to the presentation of an archaeological discovery made in January 2010 whilst I was a fellow at the French Academy in Rome: a large polyhedral sundial with the names of the winds which originally topped a high pyramid set in the Vigna Poggio, one of the *vigne* making up the huge park of Pope Julius III (1550-1555) outside Porta del Popolo, the Vigna Giulia. The pyramid, with its *sphaericum horologium*, formed an extraordinary "Tower of the Winds". It served as a belvedere, affording splendid views on Rome, as an observatory for the practice of astronomy and astrology, and as a monumental ideogram of the Pope's name, Del Monte, meaning hill or

mountain in Italian. The rediscovery of this monument shed new light on the whole design and significance of the papal garden, but also on Renaissance art and culture during the brief pontificate of Julius III.

The Tower of the Winds at the villa Giulia raises interesting questions regarding the practice of measuring time and space within the world of the garden. In the remainder of my presentation, I plan to compare this monument with other similar constructions for measuring time in earlier and later gardens. The *pyramide vastissima* described by Francesco Colonna in the *Hypnerotomachia Poliphili* is especially interesting since it was "dedicated to the sun" and is described as a very elaborate sundial. It was topped by a wind-vane in the shape of a statue of a nymph, identifiable with an allegory of Fortuna, the Italian goddess of destiny. The Tower of the Winds at the Vatican built for Pope Gregory XIII (1572-1585) in the 1580's is the best known construction of the kind in Rome. The connection with the landscape of Rome, which is a crucial aspect of the Villa Giulia monument, has been noted by scholars, yet the importance of its setting in the very midst of the Vatican gardens has not been sufficiently questioned. The same is true regarding another Tower of the Winds also built for Pope Boncompagni on top of the Quirinal palace and overlooking its extensive formal gardens. The clock that once adorned this tower is still extent. Today, it decorates the façade of the church of Sant'Atanasio dei Greci. Shaped like a dragon or *ouroboros*, the heraldic animal of Pope Gregory XIII, it served a practical and heraldic function and boost, like at the villa Giulia, an interesting discourse on the mastery over time in Papal Rome. During the pontificate of Urban VIII (1623-1644), an elaborate *meridiana* was installed within those same gardens, just below the tower, this time making use of the sun and the bees of the Barberini arms. A floral *meridiana* also existed in the gardens of the Aldobrandini villa at Frascati, visible in Matthias Greuter's engraving of 1620. The villa Borghese possessed at least two such time-measuring devices. A pavilion with a *meridiana* was built in 1688, near the main Casino. The following century, in 1790, an obelisk – *meridiana* was installed in the *giardino del lago* by Giuseppe Calandrelli, famous mathematician and astronomer, who was the first to develop an interest for Gregory XIII's then old Tower of the Wind at the Vatican.

In presenting briefly these examples, I will insist on the important relationship existing between *gnomon* and *nomen*, i.e. between the mechanical and symbolic function of those sundials and the way they are shaped as heraldic devices. I will propose that such conflation of the *gnomon* and the *nomen* in the sundials of Papal Rome essentially derives from Augustan imagery, in particular the famous *horologium Augusti* set in the green surroundings of the Campus Martius.

CV

Denis Ribouillault is professor of history of early modern art at the University of Montréal, Canada, specializing in cultural landscape and garden studies and cartography. He gained his Ph.D. at the Sorbonne with Philippe Morel in 2006. He was assistant professor at the Sorbonne (2003-5), lecturer at the Courtauld Institute of Art (2006-8), fellow at Villa I Tatti (2008-9), 'pensionnaire' at the Académie de France à Rome (2009-11). In 2003, he was summer fellow at Dumbarton Oaks and was offered the full fellowship in 2008 (declined).

His book, *Paysage et pouvoir. Parcs, jardins et décors topographiques à Rome au XVIe siècle* (Paris, Institut national d'histoire de l'art) will appear later this year. He co-edited, with Michel Weemans, *Paysage sacré. Le paysage comme exégèse dans l'Europe de la première modernité / Sacred Landscape. Landscape as Exegesis in Early Modern Europe, Florence, Olschki* (giardino e paesaggio, n. 29), 2011. His main recent publications on Early modern gardens include: „La Villa Montalto et l'idéal rustique de Sixte-Quint", *Revue de l'art*, 173, septembre 2011 – 3, p. 33-42; „Toward an Archaeology of the Gaze: the Perception and Function of Garden Views in Italian Renaissance Villas", in: *Clio in the Italian Garden: Twenty-First-Century Studies in Historical Methods and Theoretical Perspectives*, M. Benes, M. G. Lee (eds.), Dumbarton Oaks Colloquium on the History of Landscape Architecture XXXII, Washington D.C., Harvard University Press, 2011, p. 203-232; „Le ville dipinte del cardinale Ippolito d'Este a Tivoli: l'architettura di fronte all'antico, la tradizione ferrarese, e un nuovo documento su Belriguardo", in: *Delizie estensi. Architetture di villa nel Rinascimento italiano ed europeo*, acts of the international symposium (Ferrara, Castello Sforzesco, 2006), F. Ceccarelli, M. Folin (eds.), Florence, Olschki, 2009, p. 341-371; „'Paesaggio dipinto, Paesaggio reale': notes sur une fenêtre de la Villa d'Este à Tivoli", in: *Delizie in villa. Il giardino rinascimentale e i suoi committenti*, G. Venturi, F. Ceccarelli (eds.), Florence, Olschki, 2008, p. 269-287; „Le Salone de la Villa d'Este à Tivoli: un théâtre des jardins et du territoire", in: *Studiolo: Revue d'histoire de l'art de l'Académie de France à Rome*, 3, 2005, p. 65-94.
For more see, http://www.histart.umontreal.ca/personnel/DenisRibouillault.htm.

Ana Duarte Rodrigues

Gardening Knowledge: The Circulation of Agriculture Treatises in Portugal between the 16th and the 18th Centuries

The study of the circulation of Gardening knowledge in Portugal between the 15th and 18th centuries is giving its first steps in our historiography. Aurora Carapinha (1995) was the first one to call our attention to the role such books as Alonso Herrera's *Agricultura Geral* (1513) or Gregorio de los Rios's *Agricultura de Jardines* (1595) had in the conception of Portuguese gardens. Since 2008 we are enrolled in a research project on Art Treatises in Portugal, with funding from the Ministry of Science, being our field of research books interesting for the Art of Gardens.

The *corpus* of books in Portugal is specific and absolutely necessary to define. Until now a considerable *corpus* of treatises and books interesting for the art of gardens circulating in Portugal during the Early Modern period with the information could be found in the following libraries: Biblioteca Nacional de Portugal, Biblioteca do Palácio Nacional da Ajuda, Biblioteca do Palácio Nacional de Mafra, Biblioteca Pública de Évora and Biblioteca da Academia de Ciências de Lisboa. This corpus is being gathered in a database of the research project Art Treatises in Portugal, with the funding of the Foundation of Science and Technology/Ministry of Science.

We have concluded so far that Gardening knowledge was spread in Portugal through much different kind of books during the Early Modern Art – from a predominance of Agriculture

treatises in the 16th century to botanic books in the 18th century. Treatises on the art of gardens were extremely rare books in Portugal (Rodrigues, 2011). The aim of this paper is to divulge to the international community the results obtained so far within this research project, revealing all the agriculture treatises with information on gardening that circulated in Portugal, which authors were more popular and which editions had more success. Furthermore, we seek to compare the circulation of agriculture treatises with treatises on the art of gardens and with botanic books. The comprehension of Portuguese gardens can be regarded from another perspective through the circulation of gardening knowledge, which was substantially different from country to country.

Among the more than hundred books on agriculture interesting for the art of gardens found until now, we point out the texts by Gabriel Alonso de Herrera's *Agricultura Geral*, Miguel Agustin's *Libro de los secretos de agricultura, casa de campo, y pastoril*, Louis Liger's *La Nouvelle Maison Rustique* and João Garrido's *Agricultor Instruído* as the books with more circulation, so more reception, in Portugal. Although Gregorio de los Rios's *Agricultura de Jardine*s was known in Portugal, we cannot compare it with the success achieved by Alonso Herrrera's book that was popular in Portugal from the 16th until the 19th century. Also understood as a legacy of the text written by the muslim Ibn Al-Awwam which had also a great influence in the Portuguese garden with its particular water technology.

In the 16th century, besides the books in Spanish, the most successful were modern editions of antique authors written in Latin, such as Cato, and Varro's and Columella's *De Re*

Rustica. The success of these authors was prolonged until the 19th century when a French translation was still in circulation in Portugal.

Besides Spanish and Latin books, that clearly had a higher expression among us, French and Italian authors such as Charles Estienne's *Maison Rustique*, Luigi Alamani's *La Coltivazione*, or Giuseppe Falcone Piacentino's *La nuova, vaga, e dilettevole villa. Opera d'agricoltura* have also circulated among us.

However, these Spanish, French and Italian books on agriculture would not have repercussions on the art of gardens after the 17th century as they had before, because in the absence of French and Italian treatises on the art of gardens, such as Boyceau's, they would be their substitutes to patrons, architects and gardeners in Portugal. We have not found until now any copy of Olivier de Serres's *Théâtre d'agriculture et mesnage des champs*, although it was owned by the marquis of Fronteira in the 17th century, who created with it one of the most exquisite gardens by then in the surroundings of Lisbon. We have also not found any copy of the Italian Augustino Gallo's *Le diece giornate della vera agricoltura e piaceri della villa* (1564), or Agostino del Riccio's *Agricultura Teorica*, or Bartolomeo Taegio's *La Villa* (1559). English was not an accessible language in Portugal, so it is not a surprise that we have not found any copy of Thomas Hill's *A Most Brief and Pleasant Treatyse* (1563), or William Lawson's *The Country House-Wife's Garden* (1618).

The first book on this issue in Portuguese language appears only in the 18th century and it is a translation: Fr. Theobaldo de Jesu Maria's *Agricultor Instruído* (1730) translated by João António Garrido. Then, also in Portuguese, Afonso Toar da Silveira's *A nobreza dos lavradores e a vida de S. Izidro* (Lisboa, 1741) made the defense of farmers and gardeners.

So, after defining the *corpus* of books available to commissioners, architects and gardeners, we seek to determine which among these books were recommended to, or owned and possibly read, by these same artists and commissioners (through archive research), finally, to prompt an accurate picture on the spread of ideas and theories that promoted gardening as an art in Portugal and the diffusion of techniques important in itself but also to seek how the content of treatises and books on agriculture fed the identity of Portuguese gardens.

CV

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She got her PhD from the Universidade Nova de Lisboa, Faculty of Social and Human Sciences, 2004-2009. Scientific area: History of Early Modern Art; Dissertation: *A Escultura de Jardim das Quintas e Palácios dos Séculos XVII e XVIII em Portugal* (text vol. 515 pp.; docs vol. 296 pp.; 3rd vol. 821 images).

MSc - Universidade Nova de Lisboa, Faculty of Social and Human Sciences, 2004. Scientific area: History of Early Modern Art. Dissertation: *A escultura de vulto figurativo do Laboratorio de Joaquim Machado de Castro (1771-1822): produção, morfologia, iconografia, fontes e significado* (text vol. 294 pp.; II vol. 400 pp).

BA - Universidade Nova de Lisboa, Faculty of Social and Human Sciences, 2002. Degree in Art History.

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Current research interests: Gardens and Landscape Studies; Treatises and artistic literature; Iconography; Renaissance and Baroque art.

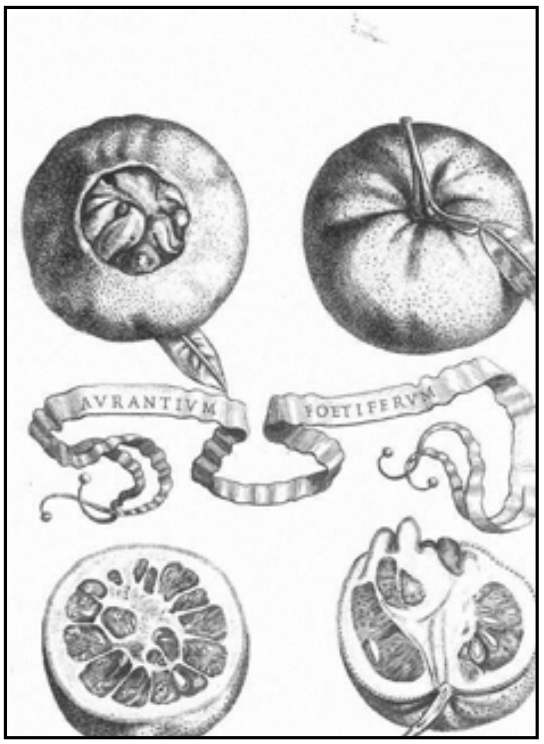
She published several books and many articles and book chapters.
Books (author): *A Escultura de Jardim das Quintas e Palácios dos Séculos XVII e XVIII em Portugal*, Textos Universitários das Ciências Sociais, Lisbon, Fundação Calouste Gulbenkian/ Fundação para a Ciência e Tecnologia, 2011 (edition of the PhD thesis through a contest); Lisboa, Rainha dos Oceanos /Lisbon, Queen of the Oceans, Lisbon, Scribe, 2011 [bilingual]; *Mulheres do Século XVIII. O Belo Ideal,* Lisboa, Ela por Ela, 2006.
Book (co-editor): With Rafael Moreira, *Tratados de Arte em Portugal/Art Treatises in Portugal*, Lisbon: Scribe, 2011.

Irina Schmiedel

Between Knowledge and Representation –
Growing, Painting, Collecting, Classifying Citrus Fruit

The Jesuit philologist and gardener Giovan Battista Ferrari's *Hesperides, sive de Malorum aureorum cultura et usu* (Rome 1646) explicitly testifies to early modern interests in the cultivation and classification of citrus fruit. Collections of diverse and sometimes extraordinary varieties were a great fashion among the noble and wealthy. The much sought-after objects existed not only *in natura* to adorn gardens, courtyards and tables, but also in various degrees of abstraction as works of art, bundling aspects of delight, utility and (not infrequently) political representation.

Frontispiece – Giovan Battista Ferrari: *Hesperides*..., Rome 1646



Aurantium Foetiferum – Giovan Battista Ferrari: *Hesperides*..., Rome 1646)

The correspondence between the erudite collector Cassiano dal Pozzo (1588-1657), who was closely involved in the compilation of Ferrari's *Hesperides*, and the Medicean court physician Franceso Nardi vividly illuminates the curiosity for both diversity and anomaly within the group of citruses. As just one example among many their letters reveal that it was a great concern to document and exchange information on names, looks, uses and the provenance of cultivars. Being part of the seventeenth century Medici court Nardi must have been familiar with existing traditions and strategies of political representation that could also incorporate citrus fruit.

As early as the fifteenth century citruses were cultivated in the gardens of the Careggi and Fiesole villas and it is telling that it was one of the family's art agents who procured "melaghrani, melaranci, limonciegli" (pomegranates, oranges and lemons) for Fiesole. Around 100 years later a panegyric poem to Cosimo I de' Medici (1519-1574) praises the Herculean rape of the Hesperidean apples, their transfer into the Medicean gardens and as palle even onto their coat of arms. Most fittingly the dynasty's first grand duke was also the founder of two of the first botanical gardens in Europe: the *giardini dei semplici* in Pisa and Florence.

Giorgio Vasari: *Hercules slaying Ladon, the dragon of the Hesperides*, 1556/57, Florence, Palazzo Vecchio, Sala di Ercole

This sketch gives an idea of horticulture in general and citriculture in particular between knowledge and representation. In my paper I will focus on the late Medici grand duchy around 1700, particularly on the horticultural passions of Cosimo III (1642-1723) who, speaking with Francesco Redi, not unlike Hercules transplanting the citruses form Africa to Greece, provided the gardens of Florence and Pisa with every foreign plant; not just for a vain and curious delight, but for the sole benefit of those who investigate and describe the diverse characters and properties of the plants.[1] I will consider Bartolomeo Bimbi's (1648-1730) botanical still lifes for one of the grand duke's favourite retreats, the Casino della Topaia close to the famous Castello villa. The artist's biographer states that the place was full of all kinds of fruit, citruses, grapes and flowers. Cosimo wanted Bimbi to paint them

1 Redi, Franceso: *Esperienze intorno a diverse cose naturali e particolarmente a quelle che ci son portate dall'Indie, scritte in una lettera al padre Atanasio Chircher della Compagnia di Gesù*, Florence 1671, in: Opere di Francesco Redi, vol. 4, Milan 1811, p. 59.

after life to document their forms, their colours and their names.[2] This painted catalogue of Tuscan floral and pomological abundance corresponds to the extensive lists, descriptions and drawings compiled by the grand ducal botanist Pier Antonio Micheli (1679-1737). A closer look at Micheli's work and social environment will provide an idea of engaging with the plant world between traditional patterns of princely representation as well as pre-Linnean tendencies of scientific specialisation and amateurish popularisation.[3]

Bartolomeo Bimbi: *Varieties of Citrus Fruit*, 1715, Poggio a Caiano, Museo della Natura Morta

Limone foltamente scannellato – Pier Antonio Micheli: Enumeratio... (ms. 48), ca. 1733-35, Florence, Biblioteca botanica dell'Università, manoscritti micheliani

Citrus fruit continued to be part of the contemporary botanical and horticultural discourse as demonstrated by Bimbi's and Micheli's works or by a lecture on the Storia degli Agrumi, given by Giovanni Domenico Civinini, a member of the Società Botanica Fiorentina, in 1734.[4] The ornamental and botanical delight in oranges, citrons and lemons went well beyond Tuscany's or Italy's borders. For instance considering the fortune a publication like Ferrari's Hesperides had in Germany and the Netherlands, along with the construction of orangeries all over Europe, the ongoing passion for the "golden apples" becomes more than evident. Such observations taken together create a complex image of early eighteenth century botany, horticulture and pomology that seemed to diverge and mingle at the same time, sticking to existing traditions and also exploring new spaces of production and perception.

2 Baldinucci, Francesco Saverio: *Vite di artisti dei secoli XVII-XVIII (1725-30),* BNCF, Fondo Palatino, ms. 565, edited by Anna Matteoli, Rome 1975, p. 247.

3 Vast information on Pier Antonio Micheli is provided by Targioni Tozzetti, Giovanni: *Notizie della vita e delle opere di Pier Antonio Micheli botanico fiorentino*, edited by Adolfo Targioni Tozzetti, Florence 1858.

4 Civinini, Giovanni Domenico: *Della storia degli agrumi all'illustriss., e clariss. sig. sen. Presidente Pier Francesco de' Ricci. Lezione accademica*, Florence 1734.

Bibliography
- Casciu, Stefano/Nepi, Chiara (eds.): S*travaganti e bizzarri. Ortaggi e frutti dipinti da Bartolomeo Bimbi per i Medici*, Florence 2008.
- Doosry, Yasmin/Lauterbach, Christiane/Pommeranz, Johannes: D*ie Frucht der Verheißung. Zitrusfrüchte in Kunst und Kultur*, Nürnberg 2011.
- Freedberg, David/Baldini, Enrico (eds.): *Citrus Fruit*, London 1997.
- Galletti, Giorgio: "Agrumi in casa Medici", in: Tagliolini, Alessandro/Azzi Visentini, Margherita (eds.): *Il Giardino delle Esperidi. Gli agrumi nella storia, nella letteratura e nell'arte*, Florence 1996.
- Hubert, Hans W.: "'Cosmic Delight': Bartolomeo Bimbi and the Representation of Nature at the Court of Cosimo III de' Medici", in: O'Malley, Therese (ed.): *The Art of Natural History. Illustrated Treatises and Botanical Paintings 1400-1850*, New Haven 2008, pp. 205-225.
- Tongiorgi Tomasi, Lucia: "The Visual Arts and the Science of Horticulture in Tuscany from the 16th to the 18th Century", in: *Advances in Horticultural Science,* 4 (1990), pp. 3-18.

CV

Irina Schmiedel earned her M.A. degree in Art History and Romance Philology from the Johannes Gutenberg Universität Mainz (2003-2009). As a fellow at Collegio Ghislieri (2006) and Collegio Nuovo (2008) she also studied at the Università degli Studi di Pavia.

In her Ph.D. project she focuses on botanical knowledge in the late Medici grand duchy in Florence considering the relationship between arts and sciences, as well as questioning tendencies towards both popularisation and specialisation of knowledge in the course of the 18th century and the role of traditional patterns such as strategies of princely representation.

After a DAAD fellowship at the Kunsthistorisches Institut in Florence (2009/10) she has worked as a research assistant in Science Studies at Aarhus University (2010/11), in Art History at the Johannes Gutenberg-Universität Mainz (2011) and since October 2011 in History of Science and Technology at the Bergische Universität Wuppertal.

Irina Schmiedel is a member of the IZWT (Interdisziplinäres Zentrum für Wissenschafts- und Technikforschung) at the Bergische Universität Wuppertal and an associate of the project "Writing Art History after Vasari – Bellori's 'modern painters, sculptors and architects', a German translation and new commentary" at the Johannes Gutenberg Universität Mainz.

Verena Schneider

The Creation of Knowledge: Reconstructing Garden History in the Early Modern Period

Focusing on the creation of historical knowledge within the German empire this contribution is positioned between scientification and the increasing professionalism in garden art in the Early Modern Period. Scholarly approaches in the reconstruction of garden history are detectible from the 16th century onwards. In comparison to today's scientific standards, however, these mainly generate knowledge of a more narrative character. Considering historiography over a period of approximately five hundred years, from the 16th until the 20th century, several paradigm shifts distinguish phases of which the first one, contemplated in this paper, extends to around 1770. Within this chronology, the works of Johann Georg Sulzer and Christian Cay Lorenz Hirschfeld mark a change towards a more critical enquiry with the topic as expressed in the narrative structure of their books and their underlying notion of scientificity.

Melchior Sebitz, *Siben Bücher Von dem Feldbau/ und vollkomener bestellung eynes ordenlichen Mayerhofs oder Landguts*, Strassburg 1579, frontispiece

Except for only a few studies on English historiography focusing mainly on the 18th century, most of which are published in the series 'Dumbarton Oaks Colloquium on the History of Landscape Architecture'[1], the history of annal-writing of garden art lacks further research. Because history was first systematized consistently far after 1700, this applies all the more to the Early Modern Period. Taking into account German-speaking sources of the Early Modern Period Clemens Alexander Wimmer published an essay about historiographical writing between 1570 and 1913, which is the only, however, cursory overview of that topic.[2] In my doctoral thesis I intend to examine this desideratum referring especially to the "long" 19th century, which for the significant changes occuring in the writing in garden art in that time can be considered as the most important era of garden historiography.[3]

To encounter the complexity of my topic adequately, I would like to discuss several topic areas regarding a diachronic as well as a synchronic reflection:

1. Which type of historic literature does include retrospections about garden art? Which genres do capture them? What kind of authors are interested in history? There is, for instance, a very heterogenic field of literature that involves genres such as agricultural and horticultural treatises, theories of architecture and household literature. However, a distinct historiographical genre is only established in the 19th century.[4] Accordingly, many different authors have presented their different views on garden history, and yet a certain canon of narrative content has been synthesised during this period.

2. What kind of functions is historiography attributed to? How is it legitimized and how do authors argue? In which way does natural science matter? Since the 16th century it became common to write introductions which consider the historical dimension of the book's topic in order to place work, topic and author itself into an ideally long tradition tracing back to antiquity. History in this regard was used as a rhetorical figure and awarded legitimation and credentials.

1 For example see the contributions of John Dixon Hunt (pp. 77-90) and Michael Leslie (pp. 91-106) in: Michel Conan (Ed.): *Perspectives on Garden Histories (Dumbarton Oaks Colloquium on the History of Landscape Architecture* 21), Washington D.C. 1999. See also Joseph M. Levine: John Evelyn: Between the Ancients and the Moderns, in: Therese O'Malley/Joachim Wolschke-Bulmahn (eds.)*: John Evelyn's "Elysium Britannicum" and European Gardening* (Dumbarton Oaks Colloquium on the History of Landscape Architecture 17), Washington D.C. 1998, pp. 57-78.

2 Clemens Alexander Wimmer: Frühe Perioden der Gartengeschichte. Ein Überblick über die gartengeschichtliche Literatur 1570-1913, in: *Zandera*, 24.1 (2009), pp. 11-45.

3 The dissertation is written at the Institut für Kunstgeschichte of the Heinrich-Heine-Universität Düsseldorf and entitles: *Historiographiegeschichte der Gartenkunst in Deutschland. Wissensgenerierung im transnationalen und interdisziplinären Kontext (1770-1914)*.

4 See chapter „E – Frühe Gartenkunsthistoriograhien" in: *Gärten wie sie im Buche stehen. Gartenkunsthistorische Publikationen des 16. bis 20. Jahrhunderts aus dem Bestand der Universitäts- und Landesbibliothek Düsseldorf*, Ausst.kat. hg. v. Irmgard Siebert/Carola Spies/Stefan Schweizer, Düsseldorf 2011, pp. 132-159.

3. What is (not) narrated in historiographical literature? What are the methods and central figures of annal-writing?

4. Considering the creation of knowledge: What kind of foundations do historic narration require? On which basis do authors draw when generating knowledge?


Allgemeiner
Gärtner/
Von Selz- und Pflan-
zung allerhandt fruchtbarer Bäume/
schöner Kräuter und Blumen/ in allerley
Gärten und Ländern/
Zu deß Menschen grösser Ergötzlichkeit;
Eingerichtet nach der Kunst-lehrenden
Regeln/ wie man die Erde recht erkennen/
verbessern/ und der Sonnen Höhe über
jeglichem Clima beobach-
ten solle;
Verfertiget durch
Hn. Peter Gabrie
Ihrer Fürstl. Durchleucht. zu Würtenberg
bestellten Garten-Inspectorem.
aus dem Frantzösischen ins Teutsche
übersetzt von
M. J. G. Scharffenstein.
In Verlegung Johann-Georg
Buchhändlere:
Zum Dritten mahl gedruckt
In Esslingen/
Durch Simeon Dannenbergern/ 1673.

Peter Gabriel, *Allgemeiner Gärtner/ Von Setz- und Pflanzung allerhandt fruchtbarer Bäume/ schöner Kräuter und Blumen/ in allerley Gärten und Ländern*, Aus dem Frantzösischen ins Teutsche übersetzt von M. J. G. Scharffenstein, Zum Dritten mahl gedruckt, Esslingen 1673, title page

CV

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Martina Sitt

Paths of Knowledge – The Bergpark Wilhelmshöhe at Kassel as a Centre of Scientific and Aesthetic Networking in Early 18th-Century Europe

My aim is to report on a research project which has been initiated by an interdisciplinary seminar on the *Bergpark Wilhelmshöhe* at Kassel (mountain park) in 2011. During this work on the subject a huge amount of new approaches to the whole complex of regarding this kind of park were discovered. As a consequence the ongoing project considers the period from the founding of the *Bergpark Wilhelmshöhe* in 1696 until 1765.

The area of the park is 2.4 square kilometers (590 acres) and makes it to be the largest hillside park in Europe. In designing and constructing this unique area not only aspects of garden design but geology, mineralogy, botany etc. had to be taken into account and even more aspects of economic and political requirements of the Landgraf (his "Wissens- und Wirtschaftslandschaft") which in former times had to be respected. This created a multi-faceted horizon of mediation in all directions of cultural fields which finally was the basis for the aesthetic staging at the *Bergpark Wilhelmshöhe*.

By now a huge amount and wide range of literature is known and enlisted which already picks out the *Bergpark Wilhelmshöhe* as a main subject. But the authors mostly looked on one aspect and ignored the networking question. Taking this into consideration my contribution will now also focus on the transfer of knowledge into (landscape) images which took place against this background of the topic of scientific networking. This subject has not been sufficiently considered. It is not the process of taking ideas and not the inspiration but the results of their importations I will concentrate on.

As until now a lot of unnoticed literary sources and original documents came up the research project "WissensWege" was initiated. These sources will help to illuminate the way natural scientists and engineers who worked at the *Collegium Carolinum* at Kassel from 1709 onwards were expected to consider also aesthetic concepts in case their research results should be integrated in the concept of this *Bergpark Wilhelmshöhe*. The walks through the park turn out to be corridors which call attention to visible results of scientific research.

Taking few outstanding personalities of the early period of the *Bergpark Wilhelmshöhe* into consideration, the two perspectives – the perspective of the history of science, which is to be discovered in this project, and the contemporaneous perspective of aesthetic concepts – will be better illustrated on European background. The aim of the Landgraf and its protégés was to create a higher harmonic unity and an extensively harmonised ensemble. This happened at the *Bergpark Wilhelmshöhe* in a unique way.

CV

Prof. Dr Martina Sitt teaches Art History at the University of Kassel since April 2010. After her studies of Art History, European History, Comparative Literature and Philosophy in Bonn, Vienna and Freiburg she did her doctoral thesis in 1990 on Jacob Burckhardt's writings on aesthetics and art criticism (Kriterien der Kunstkritik, Wien 1992). Employments in projects at the Residenzgalerie Salzburg, the Kunsthistorisches Museum in Vienna and the Technical University, Institute of Art History in Vienna, were followed by the position of the Chief Curator of Old Master Paintings at the Kunstmuseum Düsseldorf (1992-1999).

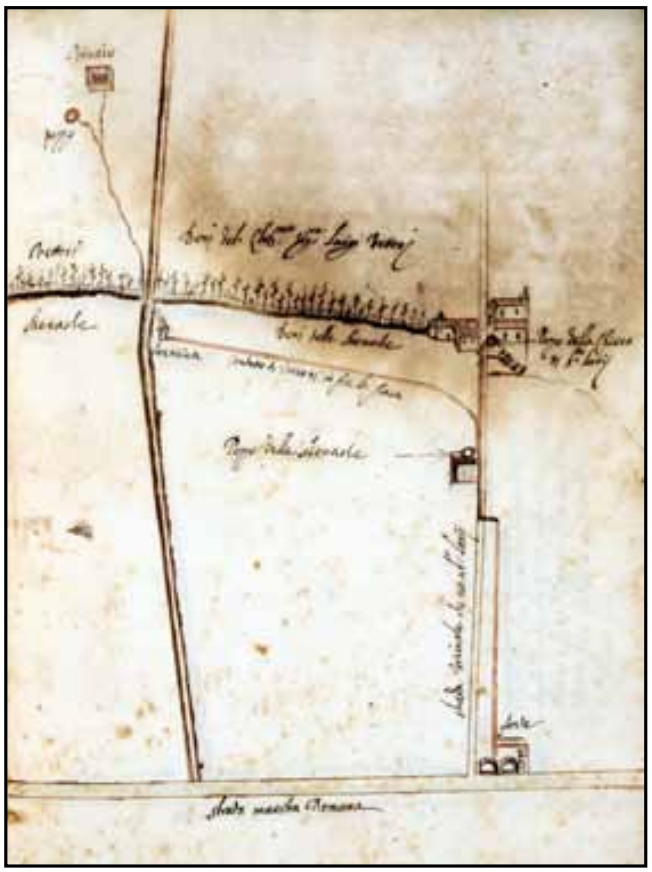
Starting in 2000 she was deputy director and chief curator of the Old Master paintings at the Hamburger Kunsthalle. Teaching at Universities since 1993 at Düsseldorf University and guest lecturering continued parallel to the museum work. She qualified as a professor in 2001 and taught as associate professor at the University at Düsseldorf and from 2006 onwards at Hamburg (University and Bucerius Law School). Her guest professorships include positions held at Budapest, Uni Roma III, Vienna and Smith College (MA), and she worked at guest curator in Museums at Trento, Rome, Luxembourg and New York. Her fellowships include the PhD Grant (1988-1990) of the Konrad-Adenauer-Foundation, 1992-1993 of the Volkswagen-Foundation (Habilitation), 2002 at the Bibliotheca Hertziana and the Getty Curatorial Grant. Her work on Netherlandish Art has involved exhibitions and books on Pieter Lastman, Jacob van Ruisdael and still life paintings, as well as the role of light in Dutch and Flemish painting. In 2008 she published a detailed inventory catalogue of the Old Master collection of the Hamburger Kunsthalle. She is currently working at a publication on the so called Master Francke, especially his Altar with scenes of the legend of Thomas Becket, and on a new research project called WissensWege.

Anatole Tchikine

Ancient Knowledge, New Aesthetics: Italian Renaissance Garden Waterworks between Theory and Practice

The principles of water supply and management in Renaissance Italy showed close dependence on those of antiquity (known both through classical texts and archaeological remains). Yet, when it came to the display of water, these traditional methods usually resulted in the creation of decidedly new types of ornaments (such as the so-called "candelabrum" fountains, water-chains, monumental cascades, and fishponds with artificial islands), which offered a response to a different set of aesthetic demands. Importantly, in the Renaissance, even such utilitarian features as irrigation channels were often given artistic articulation. The purpose of this paper is to explain the relationship between ancient technology and theory and their adaptation in the context of sixteenth-century Italian gardens, by focusing on three specific areas: (1) water supply, (2) fountain design, and (3) the nature of kinetic automata, which were common in garden grottoes.

Renaissance discourse on water heavily relied on ancient texts. Different types of water were distinguished with respect to its origin and properties (such as rivers, mountain springs, and wells, as well as rain and snow). The purest water was colourless, odourless, and tasteless, with its quality generally impaired through contact with earth and other mineral substances. Topography and different types of terrain were also supposed to have a direct bearing on its nature and composition.



Scheme of water counduits supplying a fountain in Via Senese (Florence), 1627 (Florence, Archivio di Stato, Capitani di Parte Guelfa, numeri neri, 797, supplica 292)

Sixteenth-century gardeners were supposed to utilize the best available water, since this is what humans ultimately consumed in the form of vegetables and fruit. Following the decline of the Roman system of aqueducts, however, water supply in Italian gardens had to draw on a combined range of sources, such as cisterns, wells, and open or underground conduits. Along with the most common types of water-lifting machinery, these technological solutions derived from antiquity. A crucial task, however, was to make sure that running water retained its

properties without becoming putrid. This was achieved by keeping it in circulation, usually through the use of special reservoirs, but also by making water pass through the whole system of garden waterworks (which included such features as fountains, fishponds, and grottoes). For this reason, in sixteenth-century gardens the practical functions of retaining and conserving water could never be separated from its display and aesthetic enjoyment.

The relative scarcity of fresh running water during the Middle Ages and the Renaissance heightened the general sensitivity to its appearance and sound, encouraging the creative exploitation of its visual, acoustic, kinetic, or tactile properties. Featuring water, however, was not merely an attractive sight. It purified and cooled the air, becoming a matter of hygiene and health as much as a source of pleasure. Areas around garden fountains were preferred spots for gatherings and meals, with water serving to cool drinking glasses or chill wine flasks. By employing different types of basins and nozzles, Renaissance engineers learned to create an astonishing variety of water effects, which ranged from natural-style trickling, bubbling, and rain-like display to more complex forms imitating umbrellas, mushrooms, and even fireworks.

Romolo del Tadda, Fontana dei Mostaccini, 1619-21, Florence, Boboli Gardens (detail showing an irigation channel to the left of the water-chain)

Renaissance fountains are generally seen as recreations of those of antiquity. This is true only in part, with regard to specific elements and forms (such as reclining river-gods and sarcophagus-shaped basins). In other important respects, however, Renaissance fountains resembled those of the Middle Ages (as demonstrated, for example, by their high receiving basins and meaning-rich decorative programs). Yet the sheer variety of fountain types that emerged between the late 13th and the late 17th centuries makes it impossible to reduce their design to a few basic schemes. In fact, this variety suggests that the fountain, as a structure, had to be "reinvented" during the Renaissance by adapting other, already established, artistic models (such as pulpits, candelabra, portals, triumphal arches, glass and silverware, statues on pedestals, and obelisks). Some of these solutions were ultimately rejected, while others – notably the "candelabrum" fountain with multiple tiered basins (which kept water in circulation by making it overflow from one

receptacle to another) – enjoyed enduring popularity. Enhanced by the visual and representational potential of water, this ability to absorb other artistic forms allowed fountains to become a distinctive type of Renaissance monuments.

The design of sixteenth-century kinetic automata, powered by the movement of water, was more dependent on ancient models. The operation of "singing" birds, hydraulic organs, and wooden or terracotta figures that raised their arms, rotated on their axis, "played" musical instruments, or enacted various scenes, was based on the pneumatic principles described in the book of "moving machines" by the first-century mathematician Hero of Alexandria. Particularly popular was the conceit of "chirping" birds, "silenced" by a rotating owl. Rather than becoming a restrictive factor, however, this faithful adaptation of ancient conceits stimulated Renaissance imagination. A clear indication of this was the fact that, by the end of the 16th century, classical subjects gradually gave way to contemporary scenes (such as water-spouting warships and castles, mining camps, and miniature towns with moving figures, ringing church bells, rotating windmills, and running streams). Although operated by the same principles, the appearance and meaning of these devices signalled a distinctly different cultural and artistic era.

The separation of practical and utilitarian aspects of Renaissance garden waterworks is therefore a purely modern distinction, which did not exist at the time. Although sixteenth-centuries engineers widely used ancient technological and theoretical blueprints, they adapted them to achieve new aesthetic goals. In this way, in Renaissance gardens, functional solutions usually paved way for artistic discoveries.

CV

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Alessandro Tosi

Botanical Art and the Idea of the Garden between Imagination and Science

As is well known the visual image, and the contribution of the artist to shaping the forms and models of a means of communication that was not only verbal, constituted fundamental nodal points in early modern European culture. And in the opening years of the sixteenth century, the rise of the scientific illustration accompanied and characterized the "rebirth" of the disciplines connected with the sciences of nature and of man, providing a new and more modern way of seeing, portraying, cataloguing, and in the end understanding the natural world.

This phenomenon, which was born out of the long process of the rediscovery and revision of the classical authorities achieved by humanist culture and by the formidable insights of Leonardo, may be assigned a precise date and specific context. In 1530 the printer Johann Schott began the publication in Strasbourg of Otto Brunfels' *Herbarum vivae eicones ad naturae imitationem, summa cum diligentia et artificio effigiatae*, which presented the first visual portrayal of the plant world ad vivum. In his images the artist Hans Weiditz sought to adhere to the rigorous principle of *ad naturae imitationem, in imitation of nature*, as declared by the author when he laid out his programme for a new method of investigating, describing and defining natural data.

At the same time, the rigorous objectivity of Weiditz's portrayals of individual specimens seems to be in marked contrast with the title page, where the scenes of the mythical gardens of Adonis and of the Hesperides return to a symbolic and allegorical tradition in which echoes of the Renaissance imagination of Dürer were interwoven.

A literary and erudite dimension, evocative and essentially anti-naturalistic, which may also be admired in the title page of *De natura stirpium* by the French naturalist Jean Ruelle (Paris, 1536), a splendid tapestry *aux millesfleurs* and book of hours in which the elegant veduta of the garden echoes the humanist dream of Polifilo.

The physical space of the book and the page, the *mise en page* of the plates and the complex architectonic composition of the frontispiece therefore reflected the "dual spirit" of the illustration, between *imitation* and *imagination*: on the one hand, the spirit linked to the emergence of a new form of scientific thought and that, in its close adherence to reality, imposed new rules of visual commu-

nication; and on the other hand the spirit inextricably linked to an artistic, literary and philosophical culture which continued and would continue to favour the metaphorical dimension of myth and allegory.

The place of the flower is clear, but what of the place of the garden? What idea of the garden came to be promulgated by early modern visual culture? And above all, what was the nature of the relationship that was created between art and science in the definition and representation of the garden as a space and a repository for knowledge, with its certainties, its naturalistic data, but also the tantalizingly indeterminate nature of its evocative and emotional power?

In this context, the contribution will present some reflections on the idea and the image of the garden during the course of the sixteenth century. It will begin with the crucial chapters penned by the fathers of modern botany, which reveal and affirm the role of the scientific illustration in this new method and new approach to knowledge. In *De historia stirpium* (1542) Leonhart Fuchs presented a conception that reflects the immediately recognizable typology of the botanical garden.

His garden (*in vivo iocundissimo viridario*) is a veritable encyclopaedia and space dedicated to knowledge – like the coeval natural history collection: it embodied metaphor and reality, a living and most pleasant garden composed of beautiful images on paper, and *a living and most pleasant garden* made up of plants and flowers, in both of which the aesthetic and emotional pleasures of contemplation sprang from knowledge. And in this period, the creation of the first gardens of simples associated with academic institutions – in Pisa in 1544, then in Padua and Florence, and subsequently in every part of Europe – confirmed the garden's role as a place of knowledge and science, but also as a center for the production of images.

The metaphor conceived by Fuchs was taken up by Pietro Andrea Mattioli in the edition of his work *I Discorsi* magnificently illustrated by Giorgio Liberale

(1555). Mattioli's "painted garden", like that of Fuchs, was linked to a modern conception of scientific knowledge and a new strategy for visual communication.

On the one hand therefore, an idea of the garden born of and wedded to the purposes of science, in which the image played a central role in the sharing and dissemination of knowledge. On the other hand a vision of the garden transmitted by artists and by the flourishing production of engraved images during the decades from the 1570s to the 1590s, a conception that underlined its evocative, decorative and architectonic dimensions.

In this connection between art and science, between the dual souls of illustration and visual culture in early modern Europe, at the end of the sixteenth century the garden found its own definition and forms of representation, and the ground was prepared for further development during the baroque age.

CV

Alessandro Tosi (Pisa, 1959) teaches and conducts research at the Department of Art History, Faculty of Letters, University of Pisa, as Associate Professor of Modern Art. Teaching courses on research methodologies for the study of art history and the history of the graphic arts, since 2007 is Scientific Director of the Museo della Grafica, Palazzo Lanfranchi, Pisa. Member of the editorial board of „Nuncius. Journal of the Material and Visual History of Science". Since 1984 he has participated in numerous research projects with the Department of Art History, University of Pisa, focusing in particular on the history of visual arts and the relationship between art and science from the early modern age to the present, and the history of the graphic arts. He has produced many scholarly articles, books and multi-media presentations on a wide variety of topics in these fields. He coedited the international Symposia „Linnaeus in Italy: the Spread of a Revolution in Science" (2006); „La conquista del visibile: Galileo e le arti" (2006); „Tennis and the Scientific Revolution" (2012).

Matteo Valleriani

The Organ of the Garden of Tivoli

The Renaissance garden of Tivoli was built near Rome between 1561 and 1611 as a setting for the residence of the cardinals of the Este family. The work was initiated by Cardinal Ippolito II, who died in 1572, then further supported by Cardinal Luigi d'Este until 1586 and, finally, by Cardinal Alessandro. Concerning the conception of the garden and the villa, the periods of Ippolito II and Alessandro are particularly relevant. The inauguration of the villa took place in September 1572, about three months before the death of Cardinal Ippolito II.

The garden was realized under the supervision of the architect Pirro Ligorio in association with a French engineer and his pupil. Sources written in Italian identify these as Luca Clerico and Claudio Venardo. Luca Clerico died in 1565 so the work was completed by Claudio Venardo.

These two figures were specialized hydraulic and pneumatic engineers. The need for such expertise is justified by the fact that the garden of Tivoli represents one of the most impressive early modern achievements in the field of external water technology. A myriad of fountains and water devices and, of course, the water supply system for the villa itself were installed in this garden by a considerable number of artisans and their laborers. For the functioning and supply of these installations, an elaborate aqueduct was obviously needed as well. Built on the subterranean level, this aqueduct brought water from the River Aniene to the garden by means of pipes positioned at a natural waterfall. Without entering into the subject of the iconographic and iconological meaning of the garden, it is sufficient to mention here that the role of water in such gardens was not purely decorative, but should be framed in the Renaissance conception of 'garden' as the place where nature is imitated and (by means of technology) forced to replicate an iconological, but rational, plan. Water is therefore a natural element which can, for instance in the frame of practical pneumatics, easily be used for a rational plan that intends to integrate natural and artificial elements.

The Italian Renaissance was a period when technology and pneumatics, together with architecture and metallurgy, flourished. They comprised some of the most cultivated practical activities of the period.

The presence of a hydraulic organ in the garden of Tivoli (Fig. 1) will be discussed within the conceptual and historical frame of Italian Renaissance gardens, which can be applied more or less directly to other specific gardens of the Renaissance period. The organ was built by the same French engineers, who supervised the entire water supply system and all the achievements in the frame of water technology. According to the tradition already es-

Fig. 1: Fontana dell'Organo at Tivoli's garden

power what is nowadays called a typical Heronian device, which caused a number of artificial birds to sing in harmony. Finally, the position of the organ was peculiar too, for it was situated outside and, originally, its apparatus was not covered (Fig. 2). It is often said, erroneously, that this is the only hydraulic organ conceived to diffuse sound in the open and, after this experience, all other hydraulic organs were built in closed spaces to better appreciate the music performance. This, however, is not true. In the garden of Pratolino, for instance, which was built at almost the exact same time, two hydraulic organs were built. One was built inside underneath the villa, the other was outside at Mount Parnassus. The latter device was also able to diffuse sound outside (Fig. 3). The difference between Tivoli's hydraulic organ and similar successive devices is rather due to the fact that the tablished during the late Middle Ages, this hydraulic organ had no need of a player, but was able to produce a musical piece entirely mechanically.

The peculiarities of this organ are three: its dimensions, its position and the multiple functionality of the technology that activated it. According to the archeological findings and the ensuing studies, the apparatus of the organ, situated beyond the wall of the Fontana dell'Organo, appears to be considerably larger than any other Renaissance hydraulic organ known. This could be related to its multiple functionality. The water and the mechanisms served not only to make the organ play, but also to activate a set of trumpets and to simultaneously

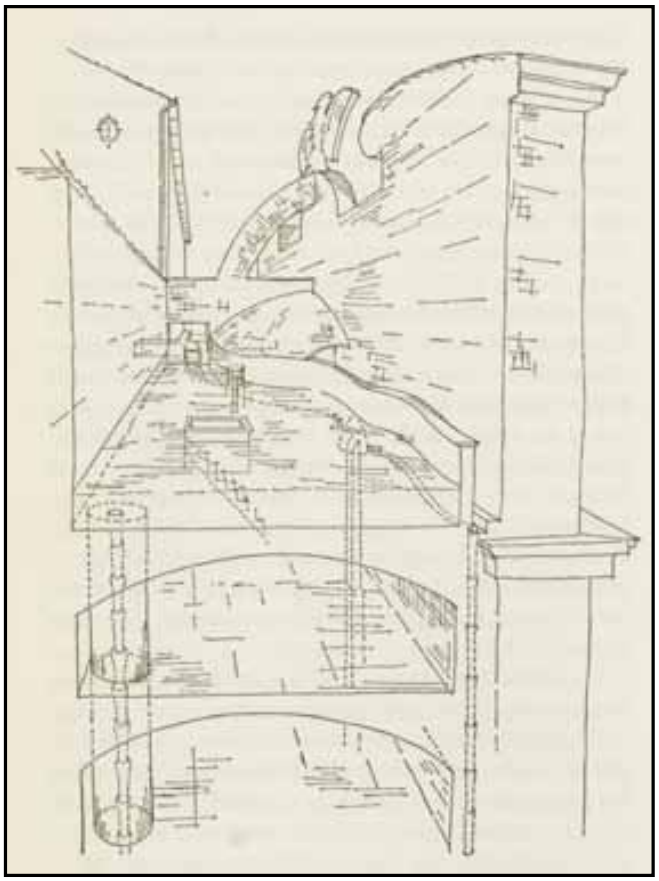

Fig. 2: Sketch of the pneumatic apparatus of the hydraulic organ of the garden of Tivoli. Carl Lamb, 1966

mechanical and pneumatical apparatus of the former was not covered or hidden. But this was soon recognized as a deficiency since it led to serious maintenance problems. At the end of the XVI century, Cardinal Alessandro d'Este finally ordered the construction of an architectural element to cover the working part of the apparatus. This decision led to the construction of Bernini's extraordinary Edicola at the base of the Fontana dell'Organo. The very first version of the organ must have been completed and functioning before September 1572, as we know that when the villa and the garden were inaugurated in that month, Pope Gregory XIII attended a musical performance of the instrument and, impressed, asked to see the mechanical apparatus beyond the wall.

Fig. 3: Il Monte Parnaso. Giovanni Guerra, 1598

Three years after this event, Federico Commandino's Latin translation of Hero's *Pneumatics* was published posthumously. This edition, which had not received any final text editing before publication, was nevertheless enriched by a series of new engravings that greatly improved its comprehensibility. This most likely led the chief engineer of the Medici family in Florence, Bernardo Buontalenti, to commission an Italian translation of Hero's Pneumatics while supervising the construction of all pneumatic devices, including the two abovementioned hydraulic organs installed at the garden of Pratolino. The translation, made by Oreste Vannoccio Biringuccio, nephew of the famous Vannoccio Biringuccio who published De la pirotechnia in 1540, was eventually finished in 1582 (Fig. 4).

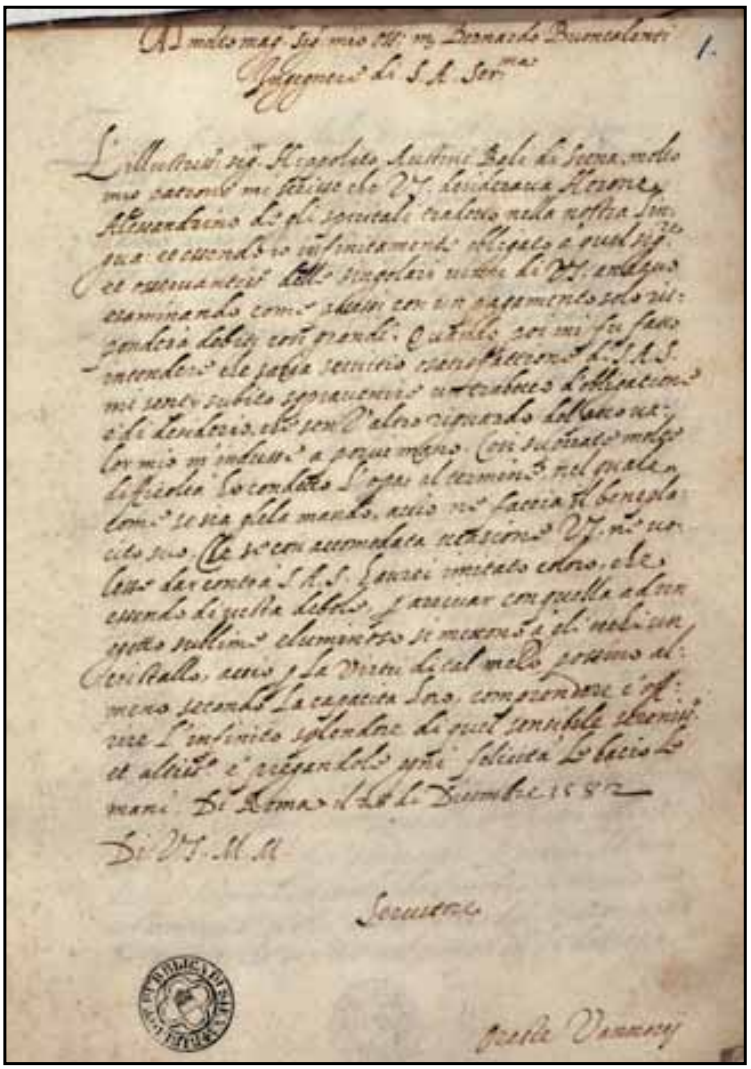

Fig. 4: Dedication letter of Oreste Vannoccio Biringuccio to Bernardo Buontalenti, December 28, 1582

Although this translation does not seem to be linked to the garden of Tivoli, it turns out that it is concerned with Tivoli's hydraulic organ and its construction in two ways.

As is well known, Hero's *Pneumatics* ends with the description of the construction and functioning of the aeolian and hydraulic organs. Although this has been overlooked in modern times, engineers of the 16th century had already noticed that Hero's description of the hydraulic organ was incorrect and attributed this problem to the corruption that the text most certainly underwent. This caused Oreste Vannoccio Biringuccio to add to the original text a description of the technical apparatus and the functioning of the hydraulic organ built in the garden of Tivoli. The addition was meant to improve on the description of the devices as they appeared at that time in Hero's text. This exceptional document, together with the entire translation, was ready for publication but then remained in manuscript form because of the premature death of Vannoccio Biringuccio. Unfortunately, the drawings for which empty spaces are left in the manuscript have never been found (Fig. 5).

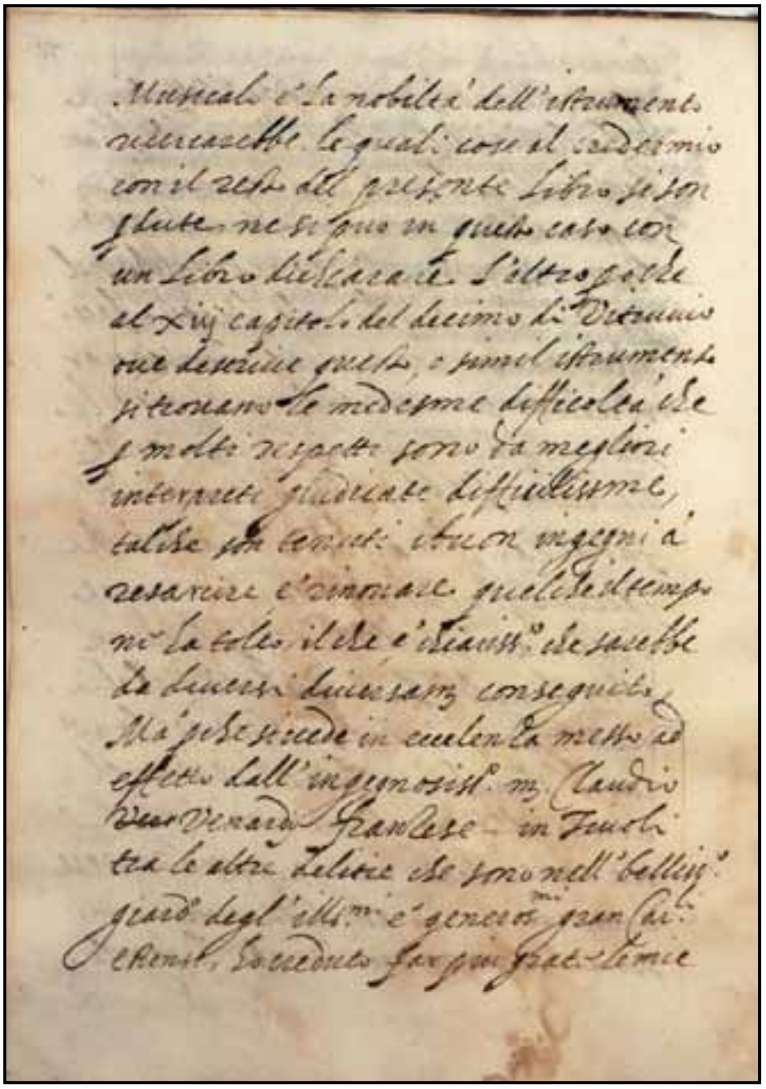

Fig. 5: On this folio (70v) of Biringuccio's text, he quotes the name of the engineer Claudio Vernardo

The information that can be found in this source, together with the analysis of the archeological fundings, offer a unique chance to complete the description of the functioning of the first version of the organ of Tivoli. A few months before Biringuccio had finished preparing the last handwritten version of his text, the organ as well as the trumpet system linked to it were illicitly destroyed. Thus, Biringuccio's description concerns a technical realization from the Renaissance, which existed, however, only for about ten years.

The second link between Biringuccio's text and the hydraulic organ of Pratolino is related to a specific technical aspect of the pneumatic device at the basis of the functioning of the instrument.

In contrast to the textual tradition related to pneumatics, the practical activities of pneumatic engineers show an impressive continuity throughout the Middle Ages, which is particularly well documented in reference to the Latin West starting from the 11th century on. Since the translation of Biringuccio deeply influenced the construction plans of the garden of Pratolino, and since Hero's description of the hydraulic organ is corrupted, a

comparison has been made between the sources at disposal concerning the hydraulic organ built at Mount Parnassus in the garden of Pratolino and Hero's organ (Fig. 6). The result of this comparison shows that hydraulic engineers of the 16th century were experienced enough to be able to build such devices with much more advanced pneumatic apparatuses than, for instance, those suggested by Hero or those described by Vitruvius. In particular, the pneumatic cylinders of the hydraulic organs of the 16th century were built with technical solutions that allowed the pressure of the air exiting towards the organ pipes to be kept stable. In this way, disturbing variations in the sound could be avoided. However, the comparison between the organ of Pratolino and Hero's description can only offer a local character to the validity of such historical result. Thus, on the basis of the analysis of the construction and functioning of the organ in Tivoli, the validity of this research result can be extended. The pneumatic cylinder of the organ of Tivoli in fact also displays technical solutions that were applied to obtain the same effect. Although such technical solutions differ in the two known cases, they were nevertheless clearly based on the same sort of abstract considerations and practical experience.

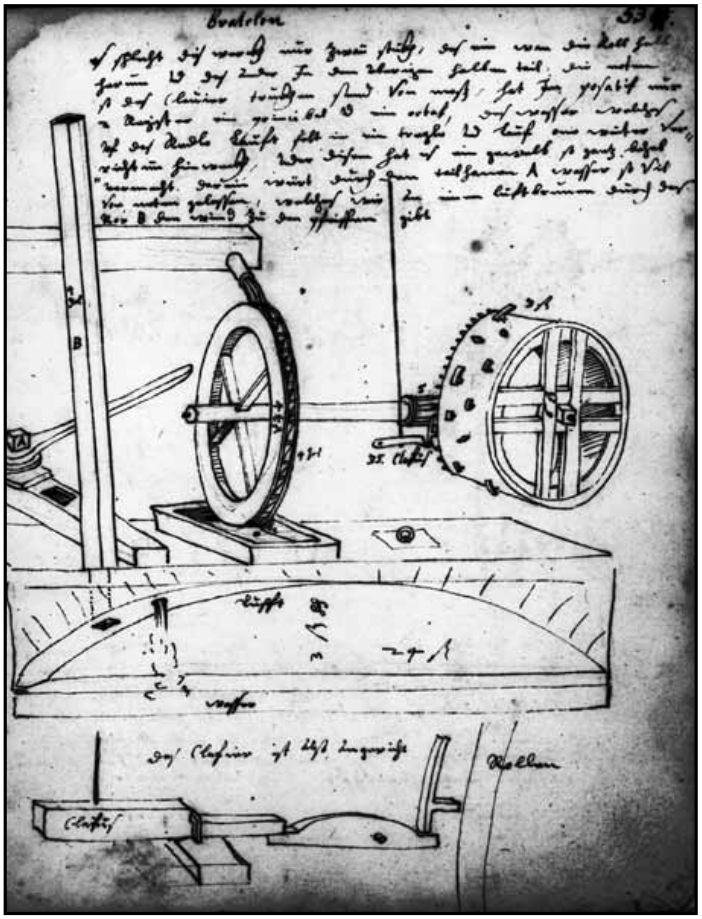

Fig. 6: Mechanical apparatus of the hydraulic organ built in the Mount Parnassus at the garden of Pratolino. Heinrich Schickardt. 1600

On the basis of this analysis, finally, the hypothesis can be formulated that when Hero's *Pneumatics* reappeared in printed form in the second half of the 16th century, the technical devices described in that text were either already obsolete or had become part of the stock of knowledge of Renaissance hydraulic engineers.

Bibliography

Degering, H. *Die Orgel, ihre Erfindung und ihre Geschichte bis zur Karolingerzeit*. Buren: Fritz Knupt, 1989. Reprint, 1989.
Lamb, Carl. *Die Villa d'Este in Tivoli. Ein Beitrag zur Geschichte der Gartenkunst*. München: Prestel-Verlag, 1966.
Markovits. *Die Orgel im Altertum*. Leiden: Brill, 2003.

Valleriani, Matteo. „The Garden of Pratolino: Ancient Technology Breaks Through the Barriers of Modern Iconology," in: *Ludi Naturae - Spiele der Natur. Transformationen eines antiken Topos in Wissenschaft und Kunst*, edited by Natascha Adamowsky, Robert Felfe and Hartmut Böhme, 120–41. München: Fink Verlag, 2010.
———. „Il ruolo della pneumatica antica durante il Rinascimento: l'esempio dell'organo idraulico nel giardino di Pratolino," in: *La civiltà delle acque dal Medioevo al Rinascimento*, edited by Arturo Calzona and Daniela Lamberini, 613–32. Firenze: Olschki, 2010.
———. „The Transformation and Reconstruction of Hero of Alexandria's «Pneumatics» in the Garden of Pratolino," in *Pratolino, un mito alle porte di Firenze - Pratolino, a Myth at the Gates of Florence*, edited by Luigi Ulivieri and Simonetta Merendoni, 155–81. Venezia: Marsilio, 2009.
Zappi, Giovanni M. *La descrittione del raro e gentil giardino del mondo fatto dall'animo regio della degna memoria dell'ill.mo e R.mo Sig.r Hiploto Cardinal di Ferrara. Fabricato in la magnifica città di Tivoli*. Tiburis artistica: Tivoli, 1576.

CV

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- The Structure of Practical Knowledge

Globalization of Knowledge
- The Aristotelianism in the World

Elizabeth Westling

Through the Looking Glass: Optics, Geometry, and Art in Renaissance and Baroque Gardens

This paper does not challenge but builds on the voluminous and highly developed literature of landscape design and the sciences – gardening and knowledge – in the Early Modern period. Using several carefully chosen examples, I will explore the symbiotic relationships between such mathematical tools as geometry, topology, and optics and the aesthetic dimensions of Renaissance and Baroque garden design.

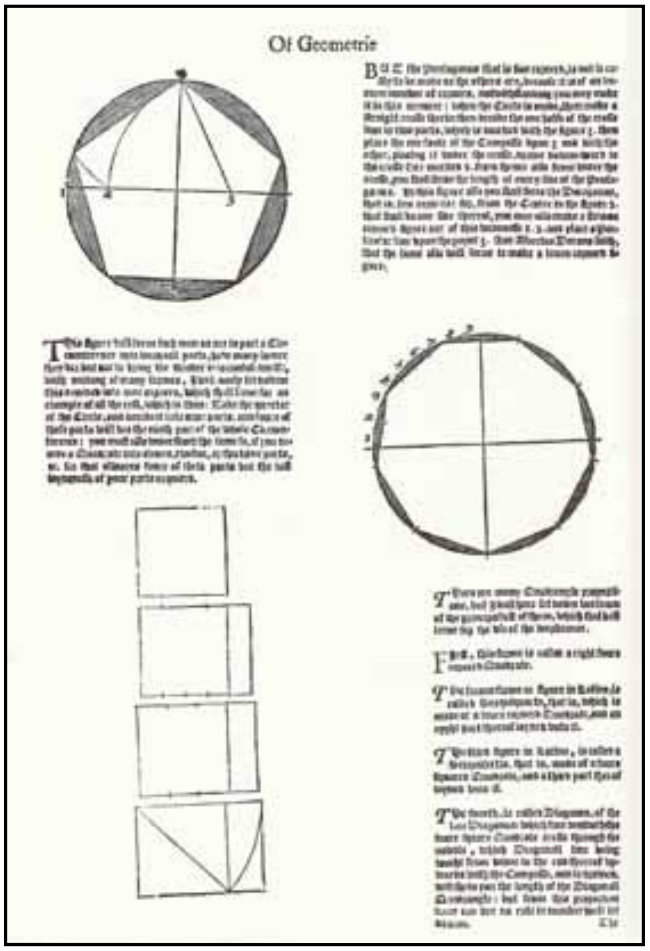
Gardens have always been the fragile and ephemeral creation of man and his constant companion. Throughout humankind's existence, a vital trust developed between man and nature – not just for what either could give to the other but for what the two could exchange in a nearly seamless embrace. The garden emerged from the timeless serenity of nature to partner with the human need for sustenance, for metaphorical imagination, and for bringing the counter-intuitive into the world as living, visible form.

This paper will highlight some of the most important tools – both physical and conceptual – that formed the garden designer's habit of mind.

1. Centuriation

Most Renaissance designers found Euclid and other Classical authors through the work of the Italian mathematician, Leonardo Fibonnacci. Italy, in particular, was home to the old Roman surveyor's technique of *centuriation*: dividing the land into squares and rectangles. In this square-based geometry, the square served as the parent shape from which all others are born by the application of certain fixed ratios and proportions. The square was perceived as 2-dimensional perfection and that perfection would follow the square into three dimensions – the cube. These designers truly believed, given the right numbers and proportions – worked out in paint, wood, stone, or plant material – that beauty and perfection would emerge as a living, breathing spirit.

From David Hockney, *Secret Knowledge: rediscovering the lost techniques of the old masters,* Viking Studio, 2001, p. 52. Detail of Raphael's portrait of Pope Leo X (1518-19)



From the *The First Book of Architecture*, made by Sebastian Serly (Serlio), entreating of Geometerie. Translated out of Italian into Dutch, and out of Dutch into English, London, Printed for Robert Peake, and are to be sold at his shop neere Holborne conduit, next to the Sunne Tauerne, Anno Dom 1611

2. Mensuration

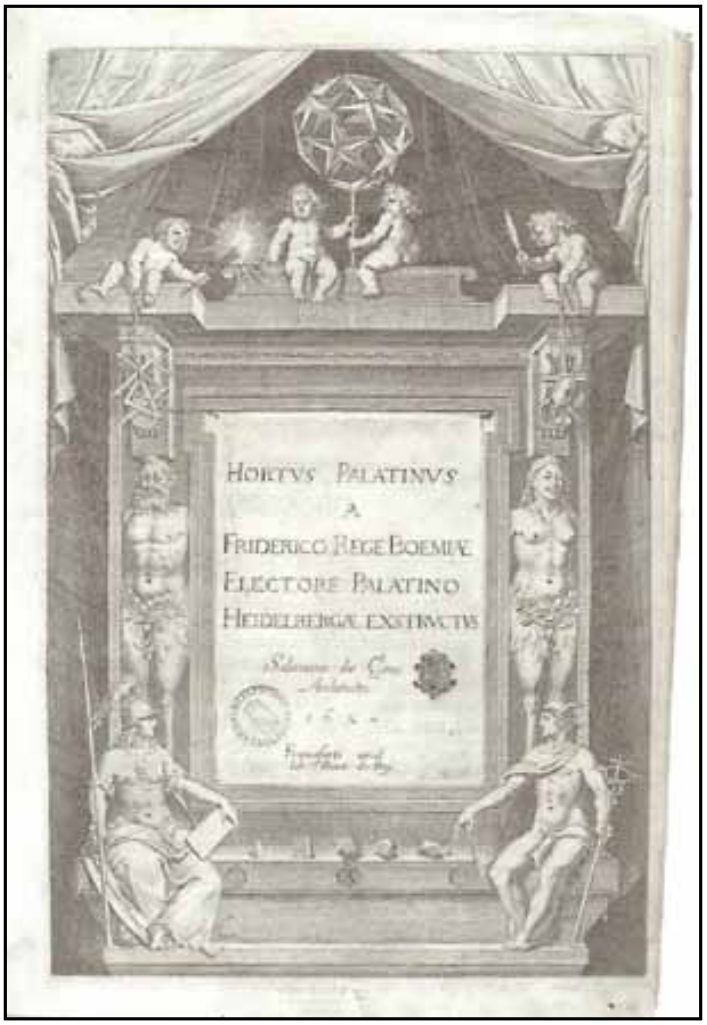
Applying Euclidian geometry to the computation of areas and volumes from specified dimensions and angles – that is, employing what they called *mensuration* – Renaissance and Baroque designers followed the Classical tradition of using the alidade, the back of the astrolabe, for measuring angles. Always motivated by the Platonic belief that vision is caused by discrete rays that emanate from the eye, optical instruments were used to connect, through the human eye, the physical shapes in this world with the spiritual world of nature.

3. Linear Perspective and the Relationship Between Time and Scale

When Filippo Brunelleschi conducted his now famous experiment in *linear perspective* at the Bapistry of San Giovanni in 1413, he employed "an almost magical optical trick, a *trompe l'oeil* painting that, in its clever confusion of life and art," quickly led painters to adopt the new technology because it had the unintended consequences of allowing them to work far more rapidly, saving valuable time while enriching the subjects of their paintings with a previously unattainable level of detail. My paper further ventures the theory that Brunelleschi's work made possible another leap forward: applying the new painter's techniques to resolving the builder's perennial spatial problems of scale and the challenge of time, in an almost uncanny anticipation of Einstein's much later discovery of the inseparability of time and space.

4. Knot Topology and the Platonic Solids

The 17th century garden of the Elector Frederick V at Heidelberg was designed by Salomon DeCaus. On the front cover of the *Hortus Palatinus*, along with the more typical iconographic symbols for garden design – Athena and Mercury – DeCaus mysteriously arrayed the

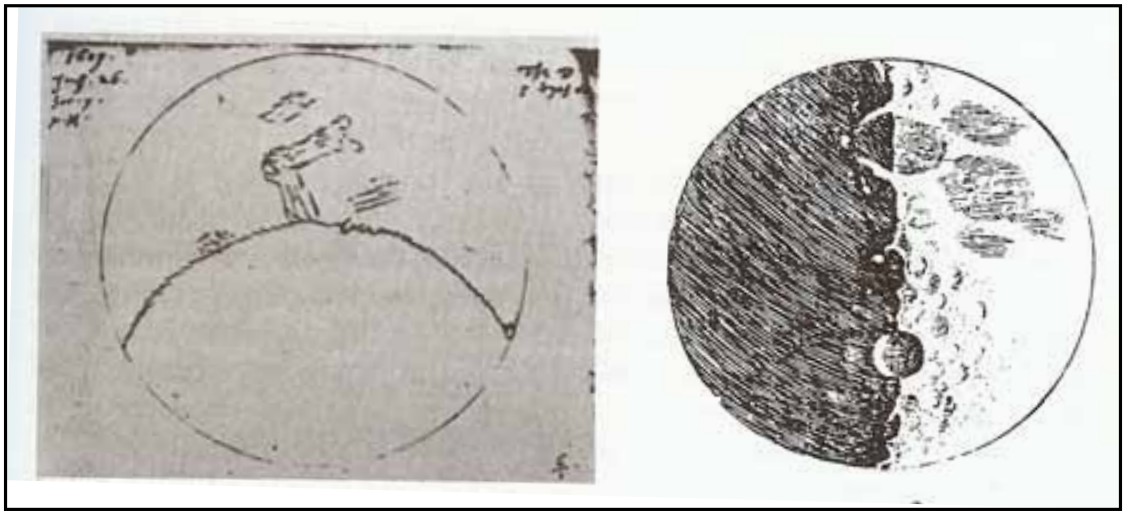


Caus, Salomon de, *Hortus Palatinus*, Frankfurt, 1620. Title page

five Platonic solids: the tetrahedron, the cube, the dodecahedron, the icosahedron and the octahedron, a most untypical set of symbols for the garden. DeCaus was an excellent mathematician and geometer and evidently saw deeply into a relationship that modern mathematics has only recently illuminated through the tools of algebraic geometry, algebraic topology, and algebraic number theory – namely, the relationship between the topology of knot designs and the geometry of such forms as the Platonic solids. Indeed, this paper argues that, in the great Heidelberg garden, the knot designs that others have identified as underlying the parterres are elegantly derived from 2-dimensional projections of the cube – the perfect Renaissance tool – laid out on a lattice grid that, when viewed from a special vantage point, provided a "perspective that was the only part of mathematics capable of providing pleasure to the sight."

5. Chiaroscuro and the Bosco

All Renaissance and Baroque designers were trained in Chiaroscuro – an artistic technique that manipulates light and shadow to create realistic 3-dimensional effects. This paper theorizes an alternative to the traditional view of the role of the *bosco* – the densely



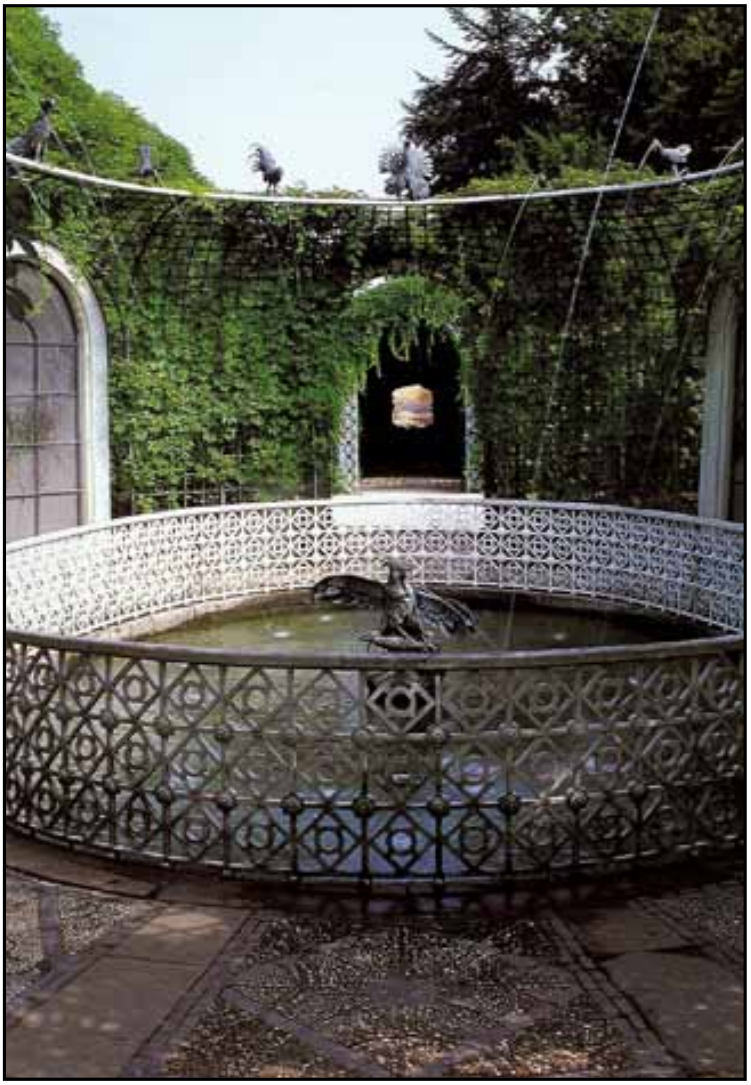
From *On the Shoulders of Giants: New Approaches to Numeracy*, Lynn Arthur Steen, Editor, National Research Council, National Academy Press, Washington, D.C. 1990, p. 169. Drawings of both Heriot and Galileo on the surface of the moon

wooded area of the garden. In the *bosco*, shade is created and light is captured and then refracted in a multitude of ways. In the bosco, which remarkably provides for the perceptive observer something like what the shadows of the moon's craters at one time provided for Galileo, nature herself serves as the ultimate manipulator of light. In the *bosco*, my paper argues, nature revealed to her most observant students the secrets of designing with this most elusive of tools, *Chiaroscuro*.

6. Trompe l'oeil and the Role of Optics

If *Chiaroscuro* was used by the Renaissance and Baroque designers to enhance the 3-dimensional in the garden, *trompe l'oeil* was the optical device that gave the deepest expression to the invisible. As a tool, *trompe l'oeil* intertwined art and symbol, metaphor and illusion. "This was the substance of Brunelleschi's magical optical trick, his trompe l'oeil, his clever confusion of life and art."

In both the Renaissance and the Baroque garden, beauty and truth alike are indeed in the eye of the beholder – not as conventional usage would have it, but *literally* connected to the beholder through the aperture of his eyes. It is in this sense that the science of optics worked physically to create or conjure Truth and Beauty, which in turn served to bind man in this temporal beatitude.



From Alain LeToquin, *The Most Beautiful Gardens in the World*, Introduction by Michel Baridon, Text by Jacques Bosser, Harry N. Abrams, Inc. Publishers, Printed in France. Fountain of the Birds. Originally belonging to the chateau of Malgrange, near Nancy, this fountain was purchased by Carl-Thedor during the estate sale of Stanislas Leszczynski, Duke of Lorraine. At the back is a trompe l'oeil entitled *The End of the World.*

CV

Elizabeth A. Westling, Landscape Designer and Landscape Historian, was born in Zurich, Switzerland and grew up in Los Angeles, California. After graduating from Scripps College in Claremont with a Bachelor of Arts in History and Humanities, she earned a Master of Arts degree in history and is all but dissertation in Reformation history from UCLA. After coming to Boston, Westling matriculated in Landscape Design at the Landscape Institute, Harvard University, graduating in 2007 with the Valedictorian Awards for both landscape design and landscape history. During the 2008 and 2009 academic years, she was a reader at Dumbarton Oaks Library, Washington, D.C., working as an independent scholar on the 17th Century Garden of the Palatinate in Heidelberg. In June 2011, Westling was selected as a Poster Presenter for the International Federation of Landscape Architects World Congress in Zurich, Switzerland. She is a practicing landscape designer and continues to write on projects of interest in landscape history.

Clemens Alexander Wimmer

The Arrangements of Plants in Renaissance Parterres between Science and Art

The arrangement of plants was a new task during the Renaissance. Both, botanists and artists were challenged to find principles of order to be generally accepted in science and in the garden. The function of the garden was primarily a place of collection of plants for science, pleasure and health. Some famous gardens were connected with cabinets of curiosities. The artistic value of the garden layout was of minor significance. But the artists were also interested to incorporate garden design into their business. The main plot where such different considerations became evident was the parterre.

Scientific garden and pleasure garden generally were not distincted. The aim to order and design the vegetable kingdom was all the same. But we should not forget that collecting plants and designing gardens were still seen in a greater theological context. Both were regarded not as occupations for its own sake but as a part of a doing agreeable to God. So the garden was not only a collection of plants and a work of art, but also a paradise regained. Ordering the world was a human duty, assigned by God. Art was not an effect of human genius, but a perfection of nature according the divine principles. Thus regarded, the garden of paradise must been a geometrical one.

Flower painting shows the high value of the individual flower species and the disregard of colour choice and harmony. But the garden was an instrument not only to collect, but also to order and to classify the plants. We can detect the following principles of ordering plants:

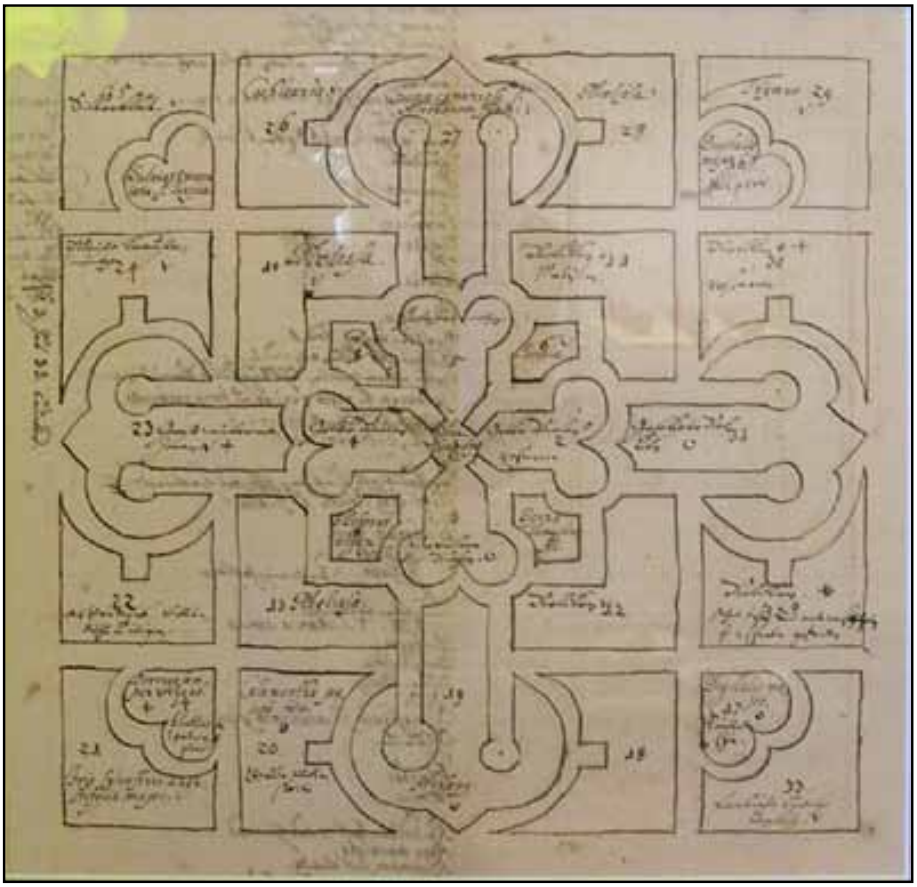
1) by use
2) by soil condition
3) by zodiac sign
4) by geographic direction
5) by temperature
6) by moisture
7) by color
8) by size
9) by flowering time
10) by physiognomic class.

Renaissance science generally agreed that there was not a single system of order but a complex system. The doctrine of signatures tried to unit the several aspects of possible relations.

The role of aesthetic development in garden design is not so clearly documented by texts, we must refer mainly to illustrations. The most important part to be considered here is the parterre, in its older form the coffer (cassettoni) parterre and in its younger form, the knot parterre.

Only few examples of planting details for Renaissance parterres are detected up to now. They show a certain disposition to symmetry, but it seems generally that principles of planting were not strictly fixed before mid 17th century.

Finally, the invention of the purely ornamental parterre, e.g. the parterre of arms, of monograms or of embroidery around 1600 marks the division of botany and art. These more modern forms were not designed to contain and display certain plants, but for emblematical or decorative purposes only. Banished from the proper beds of the parterre, flowers were restricted to borders, and their order in the borders followed exclusively aspects of form and colour. In specialised flower gardens, garden enthusiasts restricted themselves to collect a special choice of florist flowers like tulips or carnations instead of a broader botanical collection. From late 17th century onwards flowers were arranged in grids and modules without any scientific aspect. From this point of view, the parterre is a very fine example for the division of science and art in the early modern period.



Planting design for the Ducal Gardens at Gotha 1655, from: *Im Reich der Göttin Freiheit: Gothas fürstliche Gärten in 5 Jahrhunderten*, Weimar 2007

CV

Wimmer was born in 1959 at Berlin, studied garden and landscape design at Berlin Technical University, thesis at Hanover University in 1984, postdoctoral lecture qualification in 2001. He wrote various publications on garden history. One of his main subjects is the history of garden plants and practical gardening, but he never neglects design and social history, too.

The Organizing Institutions

The Centre of Garden Art and Landscape Architecture (CGL) Leibniz University of Hannover

The Senate of the University of Hannover[1] decided on 19 June 2002 at the request of the Department of Architecture and the Department of Landscape Architecture and Environmental Development[2] to establish the Centre of Garden Art and Landscape Architecture (CGL) as one of its research centres. A qualified forum with a research profile was achieved, marked by openness, interdisciplinarity and internationality. Today the CGL is one of five officially acknowledged research centres of the Leibniz University of Hannover. The other centres are the Laboratory of Nano and Quantum Engineering (LNQE), the Hannover Centre for Mechatronics (MZH), the Centre for Biomolecular Drug Research (BMWZ), and the Centre for Solid State Chemistry and New Materials (ZFM).

The endeavours to establish a research centre for garden history and landscape architecture date back to the 1990s. The symposium „The Artificial Paradise. Garden Art in the Tension between Nature and Society" in September 1996, supported by the Lower Saxony Foundation, marked the official starting point for developments in Hannover, which eventually led to the establishment of the CGL. Continuing this development, an international experts' workshop for conceptualising the research centre, supported by the Volkswagen-Foundation, took place in March 2001.

The charter of the CGL lists as its main objectives:

- Interdisciplinary research and the promotion of research in the field of garden history, garden preservation and modern landscape architecture and at intersections between architecture, city planning and the arts
- Information and exchange of experience and knowledge on an international level
- Connection of research activities and teaching
- Connection of theory and praxis; further education also outside of the university
- To impart knowledge and results of research to a scholarly as well as to a broader public (to achieve this objective the CGL has established the series CGL-Studies)
- To promote young scholars.

Belonging to the regular undertakings of the CGL are lectures, research colloquia, the organization of specialist conferences and workshops among other things on questions of the history of garden culture and design, on the history of this profession as well as on modern landscape architecture. The broad spectrum between garden history and landscape architecture of today and the openness of the research profile have proven to be successful and unique.

1 Today Leibniz University of Hannover.

2 Both departments are today united as the Faculty of Architecture and Landscape

The CGL is located close to the well-known Herrenhausen Gardens, a unique ensemble comprised of the Großer Garten, the Georgengarten, the Welfengarten and the Berggarten, an environment which makes the research in the fields of garden history and modern landscape architecture the more pleasant.

The Interdisciplinary Centre for Science and Technology Studies (IZWT) Wuppertal University

The Interdisciplinary Centre for Science and Technology Studies (IZWT, http://www.izwt.uni-wuppertal.de/) at Wuppertal University has been founded in 2004. It fosters close collaboration between history and philosophy of science as well as science studies. The main goal is to open up new avenues for interdisciplinary research with a focus on the development and structure of science and technology. The IZWT encourages interdisciplinary activities between the humanities, the social sciences, the sciences, mathematics and technology. By organising joint colloquia, lecture series and international workshops the IZWT promotes the dialogue between different cultures of knowledge and disciplines.

Among the current research projects are:

- Knowledge and gardening in the early modern period
- Botany at the late Medici court
- The Jesuits and early modern science
- Popularisation of mathematics in the 19th century
- Mathematics in the Nazi period
- The epistemology of the LHC (Large Hadron Collider, CERN)
- history of the historiography of science and philosophy

Program of the Workshop

Monday, September 17, 2012
Location: Leibnizhaus, Holzmarkt 4-6, Hannover

16.00-16.15 Welcome

Session 1: Acquisition and Organisation of Knowledge in Early Modern Gardening
Chair: Joachim Wolschke-Bulmahn (CGL, Leibniz Universität Hannover)

16.15-16.45 Clemens Alexander Wimmer (Bücherei des Deutschen Gartenbaues e. V., Berlin)
„The Arrangements of Plants in Renaissance Parterres between Science and Art"

16.45-17.00 Discussion

17.00-17.30 Iris Lauterbach (Zentralinstitut für Kunstgeschichte, München)
„Commerce and Erudition: Bourgeois Self Representation by Botany and Garden Culture in Germany, 16th to 18th Centuries"

17.30-17.45 Discussion

18.15-19.30 Evening Lecture
Michael Leslie (Rhodes College, Memphis, USA)
„The Uneasy Paradise: Why Couldn't John Evelyn Complete the Elysium Britannicum?"

Tuesday, September 18, 2012
Location: Leibniz Universität Hannover, Herrenhäuser Str. 2a, Room 009 and Room 020

Resuming Session 1: Acquisition and Organisation of Knowledge in Early Modern Gardening
Chair: Volker Remmert (IZWT, Bergische Universität Wuppertal)

09.00-09.20 Carola Piepenbring-Thomas (Gottfried Wilhelm Leibniz Bibliothek, Hannover)
„Garden Visits, Observation, Reading and Excerpt –
Martin Fogel (1634-1675) of Knowledge Acquisition Techniques"

09.20-09.30 Discussion

09.30-09.50 Verena Schneider (Universität Düsseldorf)
„The Creation of Knowledge: Reconstructing Garden History in the Early Modern Period"

09.50-10.00 Discussion

10.00-10.30 Coffee Break

Session 2: Science and Gardening in the Early Modern Period
Chair: Volker Remmert (IZWT, Bergische Universität Wuppertal)

10.30-11.00 Chandra Mukerij (University of California, San Diego)
„The Potager du Roi and the Garden of the Sun King"

11.00-11.15 Discussion

11.15-11.45 Alette Fleischer (University of Twente)
„Gardening Nature, Gardening Knowledge: Early Modern Gardens and the Rise of Natural Knowledge"

11.45-12.00 Discussion

12.00-14.00 Lunch Break

Resuming Session 2: Science and Gardening in the Early Modern Period
Chair: Michael Leslie (Rhodes College, Memphis, USA)

14.00-14.20 Anthony Gerbino (University of Manchester)
„The Topographical Survey and the Formal Garden: Cartography and Landscape in 17th-century France"

14.20-14.30 Discussion

14.30-14.50 Denis Ribouillault (Université de Montréal, Canada)
„Measuring Time in the Gardens of Papal Rome"

14.50-15.00 Discussion

15.00-15.20 Martina Sitt (Universität Kassel)
„Paths of Knowledge - The Bergpark Wilhelmshöhe at Kassel as a Centre of Scientific and Aesthetic Networking in Early 18th-Century Europe"

15.20-15.30 Discussion

15.30-16.00 Coffee Break

16.00-16.20 Elizabeth A. Westling (Cambridge/MA)
„Through the Looking Glass: Optics, Geometry, and Art in Renaissance and Baroque Gardens"

16.20-16.30 Discussion

16.30-16.50 Ana Duarte Rodrigues (New University of Lisbon)
„Gardening Knowledge: The Circulation of Agriculture Treatises in Portugal between the 16th and the 18th Centuries "

16.50-17.00 Discussion

Wednesday, September 19, 2012
Location: Leibniz Universität Hannover, Herrenhäuser Str. 2a, Room 009 and Room 020

Session 3: Botanical Knowledge
Chair: N.N.

09.00-09.30 Alessandro Tosi (Università di Pisa)
„Botanical Art and the Idea of the Garden between Imagination and Science"

09.30-09.45 Discussion

09.45-10.05 Katharina Peters (Leibniz Universität Hannover)
„From Seeing to Science or Learning by Doing – The Acquisition of Botanical Knowledge (Looking at the Court Gardeners Wendland of Hannover)"

10.05–10.15 Discussion

10.15–10.35 Irina Schmiedel (Bergische Universität Wuppertal)
„Between Knowledge and Representation –
Growing, Painting, Collecting, Classifying Citrus Fruit"

10.35–10.45 Discussion

10.45–11.15 Coffee Break

11.15–11.35 Gregory Grämiger (ETH Zürich)
„Reconstructing Order: Architecture, Layout and Plants of the Botanical Garden in Leiden During its First Hundred Years"

11.35–11.45 Discussion

Session 4: Waterworks
Chair: Sigrid Thielking (CGL, Leibniz Universität Hannover)

11.45–12.15 Anatole Tchikine (Trinity College Dublin)
„Ancient Knowledge, New Aesthetics: Italian Renaissance Garden Waterworks between Theory and Practice"

12.15–12.30 Discussion

12.30–13.30 Lunch Break

13.30–13.50 Matteo Valleriani (Max-Planck-Institut für Wissenschaftsgeschichte, Berlin)
„The Organ of the Garden of Tivoli"

13.50–14.00 Discussion

14.00–14.20 Alexander Ditsche
„Water-powered Musical Automata in Prestigious European Gardens of the 16th to 18th Century"

14.20–14.30 Discussion

14.30-15.00 Final Discussion

15.30-17.00 Guided tour „Großer Garten Herrenhausen“

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Welche Natur brauchen wir?
Anthropologische Dimensionen des Umgangs mit Natur

Interdisziplinäres Symposium
Heidelberg, 19. bis 21. September 2012

Die im Titel unseres Konzepts genannte Fragestellung ist durchaus provokant – und das mit guten Gründen. Wir sind der Überzeugung, dass die Frage, welche Natur wir Menschen für unser Überleben als Gattungswesen und für unsere Selbstbestimmung als Individuen *brauchen*, eine anthropologische Grundproblematik des 21. Jahrhunderts freilegt. Während traditionell diese Frage entweder gar nicht gestellt oder mit Verweis auf die gegebene Natur eindeutig beantwortet wurde, legen die Eingriffe des Menschen in die Natur (auch seine eigene) wie auch die Technisierung seiner Lebensumwelt vieldeutige Antwortmöglichkeiten nah. Was Natur für uns *ist* und welche Bereiche unserer Umwelt als natürlich *erfahren* werden, scheint sich einer prinzipiellen Bestimmung zu entziehen. Unser Ziel ist es, mit einer provokanten Fragestellung eine Debatte zu eröffnen und die Frage *Welche Natur brauchen wir?* in theoretischer Hinsicht und mit Relevanz für die gesellschaftliche Praxis zu präzisieren.

Am Anfang stehen Überlegungen zu ästhetischen und ethischen Aspekten von Naturerfahrung, die auf einen zweideutigen Befund zurückgehen. Zum einen rufen die mediale Darstellung aktueller vom Menschen mit-verursachter Naturkatastrophen und die ihnen zugrunde liegenden Szenarien vom Wandel des Klimas, der Bedrohung der Artenvielfalt und der Zerstörung der Natur als Lebensraum

des Menschen die Frage nach einem verantwortlichen Umgang des Menschen mit ‚der Natur' auf, die dringend nach Antworten verlangt – ohne dass allerdings klar und unstrittig wäre, worauf sich diese Verantwortlichkeit bezieht. Zum anderen zeigen die, ebenfalls in den Medien aufbereitete, Expertenkultur (Klimaforscher, Evolutionsbiologen, Ökologen, Versicherungsstatistiker usw.) und ihre Vermittlung in den politischen Debatten, dass wir weit davon entfernt sind, den Verlauf des Naturgeschehens und die Auswirkungen menschlichen Handelns auf es mit Gewissheit kalkulieren zu können.

Ob mit oder ohne mediale Verstärker, es zeigt sich, dass das Anliegen eines verantwortlichen Umgangs mit Natur haltlos ist, wenn ihm sowohl die Zwecksetzung unklar als auch ein berechnender Einsatz der Mittel unverfügbar ist. Denn worauf soll sich der verantwortliche Umgang ‚des Menschen' mit ‚der Natur' beziehen? Etwa auf die Erhaltung des *status quo* der Natur, wo doch alle Naturformen einem stetigen, wenngleich lebensweltlich kaum wahrnehmbaren Wandel unterliegen und die Menschheit ihr Überleben seit Jahrtausenden auf die aktive Veränderung ihrer natürlichen Umwelt gründet? Oder auf die maßvolle Steuerung des Wandels der Natur, obwohl uns doch dessen Faktoren und die Komplexität ihrer Wechselwirkung noch weitgehend unbekannt sind? Und ist ‚die Natur' an sich Referenzrahmen verantwortlichen Handelns oder geht es uns nur um die Erhaltung eines ‚nützlichen' Zustands für uns und nachfolgende Generationen? Diese Fragen stellen uns heute vor erhebliche Schwierigkeiten – umso mehr, als durch die Entwicklungen in Gen- und Biotechnologie die Grenzen zwischen Natur und Technik bzw. Kultur unscharf geworden und in den Naturwissenschaften längst regionale Naturbegriffe an die Stelle eines umfassenden Konzepts getreten sind.

Während also einerseits ‚die Natur' sich auflöst und die Frage nach einem verantwortlichen Umgang mit ihr durch die Einsicht in eine grundlegende Unklarheit von Gegenstand, Ziel und Mitteln irritiert wird, ist andererseits zu konstatieren: Wir halten fest an der Rede von ‚der Natur' und schreiben dabei der Natur ganz selbstverständlich einen Wert zu. Hält man diese Rede von einem werthaften Naturbegriff nicht für einen bloß naiven Sprachgebrauch, wie wir reklamieren, so stellt sich die Frage, wie dieser zweideutige, ja widersprüchlich erscheinende Befund verständlich zu machen ist. Auflösen lässt sich der anscheinende Widerspruch, wenn man in Rechnung stellt, dass sich in unserer Kultur zwei Naturauffassungen überlagern: Einerseits existieren szientistische Naturauffassungen, die Verfügungswissen über Natur durch eine analytisch-wissenschaftliche Methode und die Praxis des Experiments generieren und Orientierungswissen über und durch Natur ausschließen. Andererseits existieren unterschiedliche Formen sinnlich-ästhetischer Naturerfahrungen, die sich in symbolischen Bedeutungen und Wertungen, wie sie für jeweilige Kulturen prägend sind, manifestieren.

Unsere Konferenz soll sich der Frage widmen, ob ein angemessener Umgang mit der Natur – damit meinen wir sowohl die Natur des Menschen als auch die außermenschliche Natur – nicht jenseits dieser Opposition bestimmbar ist. Dieser Gedankengang impliziert ein Nachdenken über Natur und die Möglichkeit, unser Verständnis von Natur für eine Pluralität von Realitätskonzepten zu öffnen.

Denn wir nehmen Natur, als gegenständliche Realität, bewusst und unbewusst, leiblich, affektiv und kognitiv, sowohl im Modus der Objektivierung als auch im Modus der Subjektivierung wahr – und dies jeweils nicht unabhängig voneinander. So ist unsere Welt z.B. immer zugleich der Erfahrungsraum des Menschen, das jeweilige Objekt und der Aspekt einer symbolischen Ordnung.[1] Die Konferenz soll der Gründung einer interdisziplinären Forschergruppe dienen, die sich über einen längeren Zeitraum mit den skizzierten Fragestellungen auseinandersetzt.

Wir wollen insbesondere der These nachgehen, dass in unserer Naturerfahrung ästhetische und ethische Aspekte von Natur unmittelbar verschränkt sind, so dass die Trennung einer natürlichen und kulturell geprägten, einer lebensweltlichen und wissenschaftlichen, einer synthetischen und analytischen Naturauffassung künstlich erscheint.[2] Ohne damit eine vorrationale Erkenntnis einer den Menschen umfassenden Naturordnung behaupten oder der Rückkehr einer mythisch-romantischen Naturauffassung den Weg ebnen zu wollen, sagen wir vielmehr: Unser Versuch, ‚die Natur' und die Stellung des Menschen in ihr zu verstehen, macht es unserer Ansicht nach notwendig, verschiedene ‚objektive' Auffassungen von Natur zuzulassen und dabei gerade *nicht* zunächst ‚die Natur' und ‚den Menschen' unabhängig voneinander zu bestimmen, um anschließend nach dem Verhältnis dieser beiden Seinsformen zu fragen, sondern von vorne herein ‚Mensch' und ‚Natur' als sich wechselseitig konstituierend zu begreifen.

I. Projektidee / Forschungsstand

1. *Welche Natur brauchen wir?* Hinführung zur Fragestellung der Konferenz

Mit unserem Forschungsvorhaben schließen wir an frühere Arbeiten zur Naturphilosophie und Anthropologie an, deren Reflexionsniveau im Hinblick auf das Mensch-Natur-Verhältnis sowie die Wissenschaftstheorie und die Praxis der Naturwissenschaften für uns gleichsam als Vorbild dient.[3] Die entscheidende Differenz zur Situation früherer Jahre scheint uns an der Stelle zu liegen, wo die Bestimmung der Natur als Umwelt des Menschen, als Grenzbegriff der Geschichte und als

[1] Vgl. Boesch: *Kultur und Handlung. Einführung in die Kulturpsychologie*. Bern, Stuttgart, Wien 1980; Boesch: Das lauernde Chaos – Mythen und Fiktionen im Alltag. Bern 2000; Seel: *Eine Ästhetik der Natur*. Frankfurt/M. 1991; Kirchhoff & Trepl: Landschaft, Wildnis, Ökosystem: zur kulturell bedingten Vieldeutigkeit ästhetischer, moralischer und theoretischer Naturauffassungen. Einleitender Überblick, in Kirchhoff & Trepl (Hg.), Vieldeutige Natur. Landschaft, Wildnis und Ökosystem als kulturgeschichtliche Phänomene. Bielefeld 2009, S. 13–66.

[2] Vgl. Whitehead: *Der Begriff der Natur (Acta Humaniora: Schriften zur Naturphilosophie)*. Weinheim 1990.

[3] Siehe insb. Schwemmer (Hg.): *Über Natur. Philosophische Beiträge zum Naturverständnis*. Frankfurt/M. 1987. Dieser Sammelband enthält u.a. Beiträge von Jürgen Mittelstraß, Klaus Meyer-Abich, Odo Marquard, Peter Janich, Gernot Böhme und Robert Spaemann. Siehe darüber hinaus Plessner: Die Stufen des Organischen und der Mensch. Einleitung in die philosophische Anthropologie. Berlin & New York 1928/1975; Glacken: *Traces on the Rhodian shore: nature and culture in Western thought from ancient times to the end of the eighteenth century*. Berkeley 1967; Zimmermann (Hg.): Das Naturbild des Menschen. München 1982; Köchy & Norwig (Hg.): Umwelt-Handeln. Zum Zusammenhang von Naturphilosophie und Umweltethik. Freiburg & München 2006.

vorfindlicher Gegenstand der Wissenschaft in einer zuvor nicht bekannten Weise radikal in Zweifel gezogen wird. Es scheint heute so zu sein, dass die – in geistes- und kulturgeschichtlichen wie auch kulturanthropologischen Perspektiven konstatierte – überwältigende Fülle von Bezugnahmen des Menschen auf ‚die Natur' als vertrauter Bereich, in dem er sich selbst ‚verortet', nicht hat verhindern können, dass wir uns der Frage stellen müssen: Welche Natur brauchen wir überhaupt, um als Individuen wie auch als Gattung überleben zu können oder um uns selbst als Individuen, als Gesellschaften, als kulturelle Gruppen usw. zu konstituieren und zu verstehen? Ist Natur (perspektivisch) nicht nur als Ressource, sondern auch als Sinninstanz und Erfahrungsraum substituierbar? Die Radikalität dieser Fragestellung ist vor allem eine Folge der ‚Dislocirung' des Menschen (Hermann Lotze), die seit dem 19. Jahrhundert im Zentrum anthropologischer Reflexion steht. Ohne eine fundamentale Verschiebung in den soziokulturellen und technisch-industriellen Realitäten der zurückliegenden zwei Jahrhunderte hätte die Frage allerdings nicht ihre ganze Wucht entfalten können.

Die Frage, welche Natur wir brauchen, ist provokant. Einerseits erscheint es ‚natürlich', dass das Naturwesen Mensch der Natur als seiner Lebens- und Versorgungsgrundlage bedarf.[4] Dies wollen wir hier nicht infrage stellen, also z.B. nicht fragen, ob der Mensch sich ausschließlich durch künstlich erzeugte Lebensmittel ernähren könnte. Andererseits aber müssen wir konstatieren, dass der Erfolg der Sozial- und Biotechnologien, der vor 200 Jahren einsetzte und in den letzten Jahrzehnten an Fahrt aufgenommen hat, die Suche nach ‚Natürlichkeit' der Natur – ob als äußere Natur oder als eigene Natur – zusehends obsolet macht.[5] In konstruktivistischen Theorien wurde und wird Natur reduziert zum unerkennbaren Substrat der Projektion kultureller Ideen, zur unbestimmten Umwelt autopoietischer Systeme etc. In der Praxis wurde und wird der Zusammenhang zwischen einem materialen Naturbegriff (Aristoteles: Natur ist das nicht von Menschen Gemachte) und einem formalen Naturbegriff (Kant: Natur ist der Inbegriff gesetzmäßiger Erscheinungszusammenhänge) allmählich aufgelöst. Vor dem Hintergrund dieser Überlegungen gewinnt unsere Fragestellung politische Aktualität, aber auch theoretische Relevanz.

Wir möchten im Anschluss an die Explikation der Fragestellung (1) unsere Überlegungen in drei Perspektiven – Mensch und Natur (2), Natur als Umwelt des Menschen (3) und Lebensweltliche Praxis (4) – entwickeln und im Rahmen einer Analyse lebensweltlicher Praxis vier Aspekte der Selbstverortung des Menschen in der Natur herausarbeiten, die unsere eingangs formulierte These stützen sollen. Damit zielen wir auf die Grundlegung eines Arbeitsprogramms ab, das unseren Planungen für eine wissenschaftliche Konferenz zugrunde gelegt wird und darüber hinaus zur Konstituierung einer Forschergruppe dienen kann.

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[4] Vgl. zur Kritik an dieser Vorannahme Birnbacher: Natürlichkeit. Berlin 2006.

[5] Vgl. Foucault: Der Wille zum Wissen. Sexualität und Wahrheit. Bd. I. Frankfurt/M. 1983, S. 169–170.

2. Mensch und Natur – Über die Versachlichung einer Beziehung und den Verlust an Orientierungswissen

Während auf der einen Seite in der Wissenschaftstheorie der ‚Mythos des Gegebenen' (W. Sellars) – es gebe empirische Fakten unabhängig von einem holistischen begrifflichen Rahmen und propositionale Einstellungen (Wünsche, Überzeugungen etc.), die unabhängig von einem System von Propositionen nicht-inferentiell aus rohen Sinnesdaten hervorgehen – wie eine Nebelwand durch starke Windböen aufgelöst und das menschliche Selbstverständnis problematisch wird, bleibt auf der anderen Seite, in der Praxis des szientistischen Weltbildes, die Natur zumindest als „Faktenaußenwelt" (Arnold Gehlen) in ihrer Selbstverständlichkeit unangetastet, obwohl diese Faktenaußenwelt selbst ein Kulturprodukt ist: „Und in demselben Sinne des kulturell Bedingten gilt uns die Faktenaußenwelt als natürlich, wir können aus dieser Form der Wahrnehmung gar nicht mehr heraustreten. Das Natürliche ist generell das Selbstverständliche, und dieses ist das selbstverständlich gewordene, dessen Gewordensein aber unserem Bewusstsein abgedeckt ist".[6]

Angesichts dieser Situation zeigt sich eine Paradoxie, denn der Erforschung der Natur in den Wissenschaften und der quantitativen Zunahme des Interesses an Natur als Forschungsgegenstand korrespondiert eine qualitative Entwertung von Natur als Erfahrungsgegenstand. Was erforscht wird, dringt kaum in die menschliche Lebenswelt ein. Natur als Forschungsgegenstand generiert keine Grenzen der Forschung und keine Normen für die Lebenswelt mehr. „Menschliches Selbstverständnis muß von der erschreckenden Tatsache ausgehen, daß Natur als Orientierungsrahmen und tragender Grund nicht mehr zur Verfügung steht."[7] Die Natur ist versachlicht und damit Teil eines allgemeinen Rationalisierungsgeschehens in der modernen Lebenswelt, das Max Weber auf die Formel der ‚Entzauberung' gebracht hat.[8] Aktuell wird der Versuch unternommen, in den Verhandlungen von Ethikkommissionen, die sich mit Fragen des menschlichen Eingriffs in die einstmals als ‚natürlich' vorgestellte, d.h. als *gegeben* hingenommene Ordnung der Natur, beschäftigen, diese Situation zu verwalten. Dabei wird aber übersehen, dass ein fundamentaler Wandel unserer Wahrnehmung der Natur stattgefunden hat und immer noch stattfindet, dem wir allein mit ethischen Reflexionen nicht gerecht werden.

Natur bleibt für uns Menschen als bloße Ressource unseres Überlebens als Gattungswesen präsent. In einem instrumentell-funktionalistischen Naturverständnis reden wir verständlicherweise nur dann von der Natur, wenn sie ihre Funktionsleistung in der Gegenwart oder nahen Zukunft nicht mehr zu erfüllen droht. In der Sorge spiegeln sich Anspruch und Zweifel wissenschaftlicher Praxis. Einerseits

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[6] Gehlen: *Urmensch und Spätkultur*. 6., erw. Auflage. Frankfurt/M. 1956/2004, S. 118.

[7] Vgl. Böhme: Natur, in Wulf (Hg.), Vom Menschen. Handbuch Historische Anthropologie. Weinheim und Basel 1997, S. 92–116, hier: S. 115.

[8] Weber: Wissenschaft als Beruf, in Winckelmann (Hg.), Gesammelte Aufsätze zur Wissenschaftslehre. 3., erw. Auflage. Stuttgart 1919/1968, S. 582–613, hier: S. 594 u. S. 612. Vgl. Horkheimer & Adorno: Dialektik der Aufklärung. Philosophische Fragmente 1947/1993, Marquard: Transzendentaler Idealismus. Romantische Naturphilosophie. Psychoanalyse 1987.

scheint es keine ‚natürliche' Grenze menschlicher Produktivität zu geben; andererseits steht bislang die menschliche Praxis weitgehend unter den Bedingungen der kontingenten Resultate der bisherigen Naturgeschichte wie auch der natürlichen Gesetzlichkeiten. Nur im menschlichen Geist, im ‚Reich der Freiheit', sind die Naturgesetze außer Kraft gesetzt. Und von hier erfolgen die Invasionen ins Reich der Natur, um deren Gesetzmäßigkeiten zu erforschen und so deren Phänomene und Prozesse zu beherrschen. Ein instrumentell-funktionalistisches Naturverständnis orientiert sich am Ideal vollkommener Beherrschung der naturgesetzlich sich verändernden Natur. Natur ist in diesem Sinn Objekt technisch-industrieller Produktion und Verwertung sowie Vorbild technologischer Innovationen (z.B. in der Bionik, Biosystemtechnik, Bioinformatik, Bioökonomie). So ist im naturwissenschaftlichen Wissen unserer Zeit der Begriff der Natur in der Regel kein Thema mehr. „Die Naturwissenschaften haben aufgrund ihrer Spezialisierung nicht mehr die Natur als Ganze und aufgrund ihrer experimentellen Methode auch keine von Menschen unberührte Natur mehr zum Gegenstand."[9]

Die Frage nach der Grenze der Verwertbarkeit von Natur verweist nicht auf die Reflexion über das Mensch-Natur-Verhältnis, sondern verbleibt innerhalb der Logik eines instrumentell-funktionalistischen Umgangs mit Natur. Pointiert kann man sagen, dass schon der naturwissenschaftliche Erkenntnisvorgang ein technischer Prozess ist, weil er den Regeln des Machbaren und den Maximen der Verwertbarkeit unterliegt.[10] In der Perspektive auf ihre Funktionalität ist die Natur prinzipiell substituierbar. Der erschreckenden Tatsache, dass die Natur für uns keinen Orientierungsrahmen mehr bietet, tritt unter den Vorzeichen der biotechnologischen Revolutionen die nüchterne Erkenntnis zur Seite, dass im Verhältnis Mensch-Natur auch keine Begrenzungen der Veränderbarkeit, der Auflösung und Zerstörung wie auch der Substituierung *gegeben* sind.

Diese Überlegungen zusammenfassend können wir insgesamt – für die technisch aufgerüstete westliche Zivilisation – von einer Sichtweise sprechen, in der Natur als Horizont individueller und kollektiver Erfahrung und Identitätsbildung eine immer geringere Rolle spielt. Dieser Vorgang wird nur sehr bedingt dadurch kompensiert, dass

a) eine Orientierung an Natur im Privaten floriert, wo ‚natürliche' Ernährung, Lebensweise, Geburt, Sterben usw. unser Lebensideal bilden und Natur als Wildnis – vom einsamen Extrembergsteigen bis zum Medienevent ‚Dschungelcamp' – den Schauplatz für diverse Abenteuer abgibt. Hier steht der Kult des Essentiellen bzw. der individuellen Freiheit und die Parodie des ‚Natürlichen' nur einer reglementierten wissenschaftlich-ökonomischen und staatlich-institutionellen Praxis gegenüber, deren

[9] Vgl. Schiemann: Vorwort, in Schiemann (Hg.), Was ist Natur? Klassische Texte zur Naturphilosophie. München 1996, S. 7–9, hier: S. 8.
[10] Vgl. Habermas (Hg.): Technik und Wissenschaft als 'Ideologie'. Frankfurt/M. 1968/1969.

Prinzipien (Versachlichung, Zweckrationalität, formale Gleichheit/Gleichgültigkeit, intersubjektive Nachvollziehbarkeit etc.) davon nicht betroffen sind.

b) die Rede von der Natur unter vornehmlich negativen Vorzeichen in die öffentlichen Debatten eindringt. Denn Natur ist hier – als Klima, Wetterlage, ökologisches System, Ressource etc. – nur der Bereich, der sich einer vollständigen Funktionalisierung (noch) entzieht und dessen Widerständigkeit in unserer modernen Welt als bloßer Störfaktor wahrgenommen wird.

Der Verlust an Orientierungswissen ist daher kaum zu überschätzen. Im Blick auf das Verfahren einer Kritik der instrumentellen Vernunft können wir festhalten, dass gegenwärtig die Parodie eines Gerichtshofs der Vernunft (Kant) vorgeführt wird, da ein Richter auftritt, der seinen Zeugen und Angeklagten nicht zuhört, ihnen das ‚Vernehmen' verweigert. „Natur wird heute nicht mehr ‚um Rat' gefragt, wie die Zeugen, sondern wie ein Angeklagter ausgefragt."[11] Dieser Verengung unserer Sicht auf Natur im Modus des Ausfragens und Anklagens wollen wir mit den folgenden Überlegungen entgegentreten und damit ein Verständnis für verschiedene ‚objektive' Auffassungen von Natur eröffnen. Zugleich damit wollen wir fragen, wie ethische Werthaftigkeit von Natur heutzutage – also in Zeiten weitgehender Bedeutungslosigkeit metaphysischer Sinnkonzepte – zustande kommt.

3. Natur als Umwelt des Menschen – Zur Sonderstellung des Menschen in der Natur

Die anthropologische Debatte des 19. und 20. Jahrhunderts ist geprägt von dem bereits erwähnten Befund der ‚Dislocirung' des Menschen und seiner „Zurückstellung in die Natur" (Friedrich Nietzsche).[12] Am Anfang ist diese Entscheidung mit einer gehörigen Portion Optimismus gekoppelt, wie eine Aussage des Biologen Ernst Haeckel belegt: „Die Bestimmung der *Stellung des Menschen in der Natur* und seiner Beziehungen zur Gesamtheit der Dinge, diese Frage aller Fragen für die Menschheit, wie sie Huxley mit Recht genannt hat, wird durch jene Erkenntnis der tierischen Abstammung des Menschengeschlechts endgültig gelöst."[13] Von Seiten der Lebensphilosophie und philosophischen Anthropologie wird in der Folge allerdings entschieden um eine (Neu-)Bestimmung der Sonderstellung des Menschen in der Natur gerungen. Max Schelers Abhandlung aus dem Jahr 1927 kann als Manifest einer philosophischen Entrüstung über die Degradierung des Menschen gelten.[14]

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[11] Liebrucks: Sprache und Bewußtsein. Bd. 1. Frankfurt/M. 1964, S. 26 und passim.

[12] Nietzsche: Der Antichrist, in, *Kritische Gesamtausgabe. 6. Abteilung, Bd. 3*. Berlin & New York 1895/1969, S. 178: „Wir haben umgelernt. Wir sind in allen Stücken bescheidener geworden. Wir leiten den Menschen nicht mehr vom »Geist«, von der »Gottheit« ab, wir haben ihn unter die Tiere zurückgestellt."

[13] Ernst Haeckel: *Natürliche Schöpfungsgeschichte*. 1. Teil, Berlin 1868, hier S. 14–15.

[14] Scheler: Die Sonderstellung des Menschen im Kosmos, in Keyserling (Hg.), Der Leuchter. Weltanschauung und Lebensgestaltung. Achtes Buch: Mensch und Erde. Darmstadt 1927, S. 161–254.

Im Umfeld von Scheler wird an der Behauptung festgehalten, dass der Mensch im allgemeinen Naturgeschehen eine Sonderstellung oder zumindest eine Sonderentwicklung behaupten kann. Der Preis für dieses Festhalten ist allerdings eine theoretische Begründung der Entfremdung des Menschen von der Natur. So wird die These formuliert, dass der Mensch das Sonderwesen ist, das sein Zentrum nicht in der Welt finden kann, in die es von Natur aus hineingestellt ist. Die philosophische Theorie vom Menschen der ersten Hälfte des 20. Jahrhunderts ist über weite Strecken eine Theorie der Naturentfremdung des Menschen. Und das gilt auch noch dort, wo die Natur nicht als ein Erlebniszusammenhang aufgefasst wird, in den der Mensch gestellt sein kann oder auch nicht, sondern als seine Wirklichkeit, also als „das Fundament und der Rahmen seiner Existenz von der Geburt bis zum Tod", einer Analyse unterzogen wird.[15] Was hier als Natur bezeichnet wird, meint zwar nicht das von den empirischen Naturwissenschaften gelieferte Datenmaterial, auch nicht die Natur als Objekt theoretischer Erkenntnis im Sinne der Cartesianischen oder Kantischen Theorie, sondern die Sphäre des Menschen, in der dieser seinen Existenzvollzug erfährt. So sind in der von Helmuth Plessner geforderten einheitlichen Erfahrungsstellung zwar die Naturhaftigkeit des Menschen und seine geistige Welt miteinander verschränkt, aber zu dem Preis einer existentialen Reduktion: Natur ist hier im strikten Sinne die Umwelt des je einzelnen Menschen, in der er seine Existenzkonflikte – von der Geburt bis zum Tod – austrägt. Auch Arnold Gehlen sieht in der Natur und der Naturhaftigkeit des Menschen vorrangig ein Konfliktfeld und betont angesichts der von ihm diagnostizierten biologischen Mängelausstattung, die sich in der Unmöglichkeit einer gelingenden Anpassung des Menschen an seine natürliche Umwelt zeige, die Riskiertheit seiner Lebensführung und die „besondere menschliche ‚Technik', sich im Dasein zu erhalten."[16]

Wird also in diesen Anthropologien vorausgesetzt, dass der Mensch eine riskierte Lebensform oder in biologischer Hinsicht ein Mängelwesen ist, das sich im Denken (Selbstdeutung) und Handeln (Feststellung) stabilisieren muss, dann lassen sich alle Aspekte menschlichen Verhaltens zur Außenwelt als Maßnahmen der Konfliktbewältigung oder ‚Entlastungssysteme' (Gehlen) beschreiben. Die vorliegende Riskiertheit wird durch Formen der Fürsorge und des Spracherwerbs wie auch durch die Ausbildung von Bewusstsein kompensiert. Menschliches Handeln steht insgesamt unter diesem Aspekt der Gewinnung von Weltorientierung, die eben nicht naturgegeben ist, auch nicht im Austausch mit der Natur, sondern in einer Frontstellung ihr gegenüber errungen wird.

Vor dem Hintergrund theoretischer Begründungen der Naturentfremdung des Menschen, die selbstverständlich soziologischen und psychologischen Befunden der Zeit korrespondieren,[17] zieht Nicolai Hartmann weitreichende Konsequenzen, die bis in unsere Tage unerhört geblieben sind. Das Dilemma der anthropologischen Situation, und d.h. des Mensch-Natur-Verhältnisses, lässt sich seiner

[15] Plessner: Die Stufen des Organischen und der Mensch. Einleitung in die philosophische Anthropologie. Berlin & New York 1928/1975, S. 27. Plessner formuliert seine Grundposition in folgenden Worten (ebd., S. 26): „Ohne Philosophie der Natur keine Philosophie des Menschen."

[16] Gehlen: Der Mensch. Seine Natur und seine Stellung in der Welt. 13. Auflage. Stuttgart 1997, S. 63.

[17] Vgl. die Zusammenfassung der Diskussion in Honneth & Joas: Soziales Handeln und menschliche Natur. Anthropologische Grundlagen der Sozialwissenschaften. Frankfurt/M. 1980.

Ansicht dahingehend zusammenfassen, dass hier gar keine Relation vorliegt. Der Mensch unterscheidet sich von anderen Formen des Lebendigen als sinnsuchendes und um Sinnerfüllung ringendes Wesen – und richtet seine Suche nach Sinn nur fälschlich an die Natur, deren Geschehen für ihn jedoch sinn-indifferent ist. Deshalb muss der Mensch vor die unvermeidliche und grundsätzliche Alternative gestellt werden, dass es „*entweder* Teleologie der Natur und des Seienden überhaupt, *oder* Teleologie des Menschen" gibt.[18] Zwischen beiden Optionen gibt es keine Verbindung, eine dritte Position ist *nicht gegeben*. Die Selbstverortung des Menschen ist demnach ein Projekt, für das die Natur keinen Referenzrahmen liefert.

Mit Hartmann ist das anthropologische Denken im Horizont von Naturwissenschaft und Naturphilosophie an eine Grenze gestoßen. Wir möchten diesen Sachverhalt folgendermaßen zuspitzen: Die Pointe der philosophischen Kritik an einer Funktionalisierung der Natur in den Naturwissenschaften ist, dass mit der Aufhebung der Natur als Funktionsbegriff die Zersetzung eines Konzepts der Sinn- und Werthaftigkeit von Natur einhergeht. Die proklamierte Sinn-Indifferenz der Natur für den Menschen macht es erforderlich, dass dieser sein Maß allein in anderen, von ihm selbst geschaffenen Umwelten finden kann. Diese Konsequenz hat allerdings eine paradoxe Struktur: Gleichwohl sie in theoretischer Hinsicht zwingend erscheint, verpasst sie die lebensweltliche Praxis. Im Kern handelt es sich um Forderungen nach individueller Selbstbehauptung gegenüber Normierungsbestrebungen im Namen der Natur, der Gesellschaft, der Wissenschaft, die in der Regel – Ausnahmen mögen das bestätigen – eine Überforderung des Menschen bedeuten. Theoretisch fundiert wird vor allem die Einstellung, dass wir Menschen uns – ob als Individuen oder Gattungswesen – im Konflikt mit oder auf Kosten der Natur im Leben zu erhalten vermeinen.

4. Lebensweltliche Praxis – zur Selbstverortung des Menschen

Die Konsequenzen der Debatten in der philosophischen Anthropologie mögen in theoretischer Hinsicht desaströs sein, in der lebensweltlichen Praxis eröffnen sie den Raum für eine (Re)Konstruktion der – nun nicht mehr dem Anspruch nach ‚natürlichen' – Natur als Umwelt des Menschen. Entsprechend unserer eingangs angeführten These sind wir der Ansicht, dass mit der beschriebenen funktionalen Bestimmung von Natur ihre Bedeutung für die Selbstverortung und -bestimmung des Menschen nicht zureichend beschrieben ist. Auch nach der Auflösung von Substanzbegriffen in relationale Funktionsbegriffe[19] und trotz der kulturell bedingten Dominanz einer instrumentellen Naturauffassung in modernen Gesellschaften, erschöpft sich die Bedeutung von Natur

[18] Hartmann: Ethik. 2. Auflage. Berlin & Leipzig 1935, S. 185. [Hervorhebungen im Zitat, GH/TK]

[19] Vgl. Cassirer: Substanzbegriff und Funktionsbegriff. Untersuchungen über die Grundfragen der Erkenntniskritik. Berlin & Darmstadt 1910/1994; Rombach: Substanz, System, Struktur. Die Ontologie des Funktionalismus und der philosophische Hintergrund der modernen Wissenschaft. Freiburg & München 1965.

nicht in ihrer bloßen Nützlichkeit.[20] Die Kritik an unserem Naturverständnis im Sinne eines Gebrauchswerts, dessen Funktionalität für die Anpassung des Menschen und sein Überleben bestimmbar ist, verpasst geradezu das vieldimensionale Spektrum von Naturerfahrung. Die radikalen Theorien der Naturentfremdung hingegen bleiben zumindest *ex negativo* einem substantialistischen Menschenbegriff und/oder Naturverständnis verpflichtet und verfehlen ebenfalls die phänomenale Pluralität von Naturerfahrung.

Was Natur für uns Menschen ist, das bleibt eine ernst zu nehmende Frage, auch wenn eine instrumentell-funktionale Bestimmung eine Antwort ausspart oder die Freilegung der ‚Wesenheit' von Natur, ihrer verborgenen ‚Wahrheit', unseres eigenen natürlichen Wesens oder irgendeines anderen stabilen Werthorizonts nicht möglich erscheint. Eine andere Weise, nach Antworten zu suchen, hängt mit unserer eingangs genannten These zusammen, dass wir mit der Möglichkeit rechnen müssen, dass verschiedene ‚objektive' Auffassungen von Natur in unserer Lebenswelt für uns relevant sein können und dass „Menschen" und „Natur" nicht zunächst unabhängig voneinander zu bestimmen sind, um anschließend nach ihrem Verhältnis zu fragen, sondern dass „Menschen" und „Natur" von vornherein als sich wechselseitig konstituierend begriffen werden müssen. Dieser Gedanke impliziert ein ‚materiales Apriori' naturphilosophischer Reflexion. Dies meint ebenfalls, dass Natur als Erfahrungsraum für die menschliche Lebens*praxis* bedeutsam ist und in dieser Bedeutsamkeit auch *theorie*fähig sein kann. Hinweise hierfür liefern die evolutionsbiologische, die kulturanthropologische und –historische, aber auch die entwicklungs- und kulturpsychologische Perspektive, deren empirisches und theoretisches Wissen in eine allgemeine Theorie der Naturerfahrung zu integrieren ist.

In einem ersten Schritt ist zu zeigen, dass es ästhetische, moralische, religiöse und weitere Sinndimensionen der Natur gibt, die innerhalb einer symbolischen Ordnung, innerhalb der ‚Kultur' bestimmter Menschengruppen bestehen. In einem zweiten Schritt ist dann zu fragen, wie diese Sinndimensionen zustande kommen, d.h. wie sie in der Naturerfahrung, die in lebensweltliche Zusammenhänge eingebettet ist, verankert sind. Wir können beide Punkte hier nur kursorisch erfassen und in der Form eines Arbeitsprogramms formulieren.

Was unter Natur verstanden wird, das ist sozio-kulturell variabel.[21] Dass aber Natur ein Gegenüber des Menschen, an dem er teilhat und von dem er sich zugleich abgrenzt, ein Referenzrahmen

[20] Vgl. Ernst Cassirers Weg von der Erkenntnistheorie zur Anthropologie. Hinweise dazu in Hartung: Das Maß des Menschen. Weilerswist 2003.

[21] Vgl. z.B. Gloy: Das Verständnis der Natur. Band 1: Die Geschichte des wissenschaftlichen Denkens. München 1995; Gloy: Das Verständnis der Natur. Band 2: Die Geschichte des ganzheitlichen Denkens. München 1996; Groh & Groh: *Weltbild und Naturaneignung. Zur Kulturgeschichte der Natur*. Frankfurt/M. 1996; Groh & Groh: *Die Außenwelt der Innenwelt. Zur Kulturgeschichte der Natur 2*. Frankfurt/M. 1996; Schiemann (Hg.): Was ist Natur? Klassische Texte zur Naturphilosophie. München 1996; Kirchhoff & Trepl (Hg.): Vieldeutige Natur. Landschaft, Wildnis und Ökosystem als kulturgeschichtliche Phänomene. Bielefeld 2009; Drexler: Landschaft und Landschaftswahrnehmung: Untersuchung des kulturhistorischen

kultureller Selbstkonstitution ist, das scheint lebensweltlich gesehen unbezweifelbar. Nun zeigt sich jedoch, dass in der kulturellen Existenz des Menschen verschiedene Aspekte der jeweiligen, durch den Lebensraum und durch den Zivilisationsstand vorgegebenen ‚Umwelt' als ‚die Natur' integriert sind.[22] *Wir drehen an dieser Stelle den Blickwinkel* und fragen nicht, welche Natur sich als Umwelt des Menschen manifestiert oder funktional durchsetzt, sondern wir fragen danach, unter welchen Bedingungen bestimmte Ausschnitte der Umwelt als ‚Natur' angesprochen werden. Wir fragen also nach den evolutionsbiologischen, psychologischen und vor allem kulturellen Bedingungen der Möglichkeit der Objektivität, d.h. intersubjektiven Geltung, bestimmter Naturauffassungen.

Diese Überlegungen führen zu der weitreichenden Behauptung, dass für die Selbstkonstitution des Menschen ein Verhältnis zur ‚Natur' ein weit verbreitetes, vielleicht sogar universal-anthropologisches Prinzip ist. Entsprechend hat Gernot Böhme konstatiert, dass es zwar keine eindeutige Antwort auf die Frage gibt, was die Natur für uns bedeutet, aber dennoch klar sei, dass die Natur für das Selbstverständnis und die Selbstverortung des Menschen von zentraler Bedeutung ist. Diese Bedeutung würde sie erst verlieren, „wenn man den [klassischen] Modellen der Selbstverständigung des Menschen […] solche entgegensetzen könnte, in denen die Natur keine Rolle spielt."[23] Wir möchten an dieser Stelle hinzufügen, dass in einem nachgerade *nicht*-klassischen Sinn darüber nachgedacht werden muss, dass Natur als Erfahrungsraum des Menschen unumstößlich eine Rolle spielt – und das unbeschadet der Nichtfassbarkeit einer ‚natürlichen Natur' für uns Menschen. Wir gehen so weit davon zu sprechen, dass eine solchermaßen un-wesentliche und dys-funktionale Natur als Erfahrungsraum einen ‚Wert' darstellt. Ihre Werthaftigkeit hängt nicht mehr an ihrer ontologischen Dignität (wie z.B. in der Physikotheologie), an ihrem jeweiligen phänomenalen Bestand (wie z.B. in den Debatten zur Biodiversität) oder an ihrer symbolischen Macht (wie z.B. in der medialen Aufbereitung des Naturschutzes u.a. zu Werbezwecken), sondern zuerst einmal und in einem fundamentalen Sinn daran, dass sie Erfahrungen eines lebendigen Anderen in seiner phänomenalen Vielheit ermöglicht. In anderen Worten: Natur ist ein Ermöglichungsraum von Erfahrungen, die sich nicht restlos in der Sprache der Funktionalität auflösen lassen.

Dass Natur für uns – jenseits von Metaphysik und Mystik, und damit jenseits der Möglichkeit, Natur als objektiv gegebene Orientierungsinstanz zu deuten – Sinndimensionen hat und als Sinninstanz fungiert, gründet darin, dass sie diesseits *theoretischer* Überlegungen über ihr ‚Wesen', ihr ‚Ansichsein', ihre ‚Natürlichkeit' usw. in *praktischer* Hinsicht als Erfahrungsraum vorfindlich, zuhanden, verfügbar, vertraut ist und in dieser Zuhandenheit für uns Menschen als werthaft konnotiert ist. Ihre Werthaftigkeit ist einerseits durch sinnesphysiologisch zu beschreibende Bedingungen

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Bedeutungswandels von Landschaft anhand eines Vergleichs von England, Frankreich, Deutschland und Ungarn. Saarbrücken 2010.

[22] Vgl. Joachim Radkau: Natur und Macht – Eine Weltgeschichte der Umwelt. München 2000.

[23] Vgl. Gernot Böhme: a. a. O., S. 113.

organisiert und wohl auch in Teilen phylogenetisch, aber andererseits auch kulturell geprägt. Gemeint ist hier das Zusammenspiel mehrerer Faktoren, zu denen wir folgende zählen:

1) eine physiologisch beschreibbare Resonanzerfahrung,

2) eine Wahrnehmung von ‚Natur' als phänomenale Ganzheit, die lebensweltlich vertraut ist und als beständig erscheint; ihr korreliert eine kulturell geleitete Prägnanzbildung im Wahrnehmungsvorgang,

3) eine ästhetisch-ethische Konstituierung der Werthaftigkeit von Natur sowie

4) eine symbolische Repräsentation von Natur, die dem Menschen als Projektionsfläche für seine Innenwelt und für kulturell geprägte Ideale dient.

Diese vier Aspekte der Naturerfahrung bzw. Naturbeziehungen führen jeweils zu spezifischen Formen ästhetischer und ethischer Werthaftigkeit von Natur. Um diese Thematik anzugehen, sind mehrere Denkansätze miteinander zu kombinieren, für die im Folgenden nur Namen und Konzepte an der Stelle extensiver Problemerörterungen stehen können.

ad 1) Zum Phänomen der Resonanz hat der Anthropologe Arnold Gehlen erhellende Vermutungen angestellt. Seiner Auffassung nach ist der Mensch schlechthin darauf angewiesen, das Projekt seiner Selbstdeutung auf dem Umweg über ein ‚Anderes-als-Menschliches' anzugehen. Er ist verwiesen an die rhythmischen und zyklischen Bewegungsabläufe in seiner Außenwelt, denen sein Organismus in zentralen Bereichen der Atmung und des Herzschlags korrespondiert. „So faszinieren ihn die analogen Vorgänge der Außenwelt kraft einer ‚Resonanz', die sozusagen eine Art des inneren Sinnes für das Eigenkonstitutionelle im Menschen darstellt, der auf alles anspricht, was dieser Eigenkonstitution in der Außenwelt ähnelt."[24] In anthropologischer Hinsicht ist die Vermutung Gehlens folgenreich, denn sie bindet unsere Analyse der Naturerfahrung an die physiologische Beschreibung – und an die ontologische Hypothese (vgl. Nicolai Hartmann) –, dass es eine Korrelation zwischen den Bewegungsmomenten in der Außenwelt und den Bewegungsverläufen unseres menschliches Wahrnehmungsapparats gibt. Das weitergedacht, leben und schaffen wir Menschen uns (sinnlich, kognitiv, physisch-materiell und symbolisch) unsere Umwelt, die jedoch nicht beliebig variabel ist, sondern immer eine bestimmte Natur-Umwelt des Menschen ist.[25] Um einen naturalistischen Kurzschluss zu vermeiden, ergänzen wir diesen methodischen Ansatz um eine Bestimmung menschlicher Erfahrung durch Prägnanzbildung und eine Theorie der wechselseitigen Konstitution von Individuum, Gesellschaft und Natur.

ad 2) Naturerfahrung ist Wahrnehmung von ‚Natur' als phänomenaler Ganzheit, deren Vorhandensein und Ganzheit aufgrund der lebensweltlichen Vertrautheit und Unterstellung ihrer Beständigkeit eine

[24] Gehlen: Die Seele im technischen Zeitalter. Frankfurt/M. 2007, S. 16.
[25] Vgl. schon Uexküll: Umwelt und Innenwelt der Tiere. Berlin 1909.

Werthaftigkeit impliziert. Dabei spielt es eben keine Rolle, dass das in der Erfahrung Gegebene, Beständige, Vertraute weder statisch noch die ‚natürliche' Natur ist. In diesem Zusammenhang sind Anregungen der phänomenologischen Forschung Merleau-Pontys aufzunehmen.[26] Auch neuere Denkansätze in der ökologischen Theorie weisen in diese Richtung.[27] Ernst Cassirer ist im dritten Teil der *Philosophie der symbolischen Formen* der Frage nachgegangen, mit welchem Recht sich behaupten lässt, dass ein Wahrnehmungsgehalt, der nur in der Formung durch das Bewusstsein, nicht aber *vor* dieser besteht, überhaupt etwas und nicht vielmehr nichts repräsentiert?[28] Cassirer gibt eine Antwort auf diese Zweifelsfrage mit seiner Konzeption der ‚symbolischen Prägnanz'. Unter symbolischer Prägnanz ist zu verstehen, dass jedes einzelne Wahrnehmungsphänomen in sich strukturiert und auf ein Sinnganzes bezogen ist. Symbolische Prägnanz ist nach Cassirers Auffassung der angemessene Terminus, um die wechselseitige Verknüpfung von sinnlicher und geistiger Sphäre, d.h. die Wechselbeziehung von Sinnlichkeit und Sinn – im Gegensatz zur Einseitigkeit des Resonanzerlebens – auf den Punkt zu bringen.[29] Mit dem Begriff der symbolischen Prägnanz liefert Cassirer eine Konzeption, mit deren Hilfe er den symbolischen Prozess erkenntnistheoretisch fundiert. Seiner Auffassung nach ist es notwendig, die Phänomenologie der Erkenntnis in ihrem Grenzbereich, dort wo die Vermittlung von Wahrnehmung und geistiger Formung scheitert, zu vertiefen. „Und damit erweist sich erst ganz, wie sehr nicht nur unser Denken der Welt, sondern wie schon die anschauliche Gestalt, in welcher für uns die Wirklichkeit ‚vorhanden' ist, unter dem Gesetz und unter der Herrschaft der symbolischen Formung steht. Der alte scholastische Satz: *forma dat esse rei* gewinnt hier eine neue Geltung."[30]

ad 3) Mit Cassirers Analyse des symbolischen Prozesses ist für die Bestimmung der Naturerfahrung eine gewisse Klarheit gewonnen. Was immer wir auch als Natur wahrnehmen, es erhält seine anschauliche Gestalt und Ganzheit durch ein menschliches Formungsprinzip. Wir sehen hier aber auch, dass Cassirers Theorie ein entscheidender Punkt ermangelt, denn es fehlt eine Bestimmung des vertrauten Umgangs mit Natur, wie sie auf den Ebenen der physiologischen Anthropologie (Resonanzerleben) und der Kulturanthropologie (Wahrnehmung von Ähnlichkeiten) umschrieben wird. Und es fehlt bei ihm ein Verständnis der fundamentalen Verschränkung von ästhetischen und ethischen Aspekten der Naturerfahrung. Die Aspekte der Werthaftigkeit unserer vorhandenen Naturumwelt werden in der materialen Wertethik Max Schelers und in der Tradition des

[26] Vgl. Maurice Merleau-Ponty: Die Natur. Aufzeichnungen von Vorlesungen am Collège de France 1956-1960. Deutsche Übersetzung: München 2000.

[27] In der Lebenswelt dominieren wohl noch statische, gleichgewichtstheoretische Naturbegriffe, wohingegen in der Naturwissenschaft Ökologie seit einigen Jahrzehnten Theorien dynamischer, gleichgewichtsferner ökologischer Systeme überwiegen (vgl. Rohde: Nonequilibrium ecology. Cambridge 2005; zu den älteren ökologischen Gleichgewichtstheorien siehe Egerton: Changing concepts of the balance of nature, Quarterly Review of Biology 48 (2): S. 322–350, 1973).

[28] Cassirer: *Cassirer: Philosophie der symbolischen Formen. Bd. 3. Phänomenologie der Erkenntnis*. Nachdruck der 1. Auflage von 1929. Darmstadt 1994.

[29] Cassirer: a. a. O., S. 235.

[30] Cassirer: a. a. O., S. 243.

Wertrealismus im 20. Jahrhundert immer wieder behandelt.[31] Neuerdings liefert der Philosoph John McDowell in seiner Abhandlung *Ästhetischer Wert, Objektivität und das Gefüge der Welt* einen weiteren Versuch, Licht ins Dunkel einer Debatte zu werfen, deren Bedeutung für eine mögliche Kritik am herrschenden Szientismus noch zu bestimmen sein wird.[32]

McDowell entwickelt in verschiedenen Abhandlungen eine subtile Kritik am szientistischen Objektivitätsbegriff und legt die Grundlagen eines Naturverständnisses, nach dem Natur nicht der ‚bloße Rest' ist, der nach Abzug von allem wissenschaftlich-rationalen Kalkül übrigbleibt. Vielmehr übernimmt er das Wittgensteinsche Diktum, dass rationale Einstellungen und Wahrnehmungen ‚Lebensformen' reflektieren und wir daher berechtigt sind, die uns umgebende Außenwelt in ihrem Sosein anzunehmen und zu vernehmen. Denn „Erbitterung darüber, dass das, was wir glauben, das ist, was *wir* glauben, ist sinnlos."[33] Positiv formuliert heißt das: Unsere Wahrnehmungen von Natur implizieren Stellungnahmen, hinter die wir nicht zurücktreten können. Es ist für uns Menschen ‚natürlich', dass wir Aspekte unserer Umwelt als ‚Natur' und zugleich als werthaft für uns auszeichnen. Ästhetische Stellungnahmen und Wertungen haben, das ist McDowells These, ethische Relevanz. In einer „Phänomenologie der Werterfahrung",[34] zu der er nur erste Überlegungen anstellt, müssen unserer Ansicht nach die genannten Momente der Resonanz im Naturerleben und der Prägnanzbildung in der Naturerfahrung integriert werden.

ad 4) Theorien, denen zufolge die Natur in objektiv-ontologischem Sinn Subjektcharakter hat, beseelt ist oder zumindest seelenähnlichen Charakter hat, gelten in den modernen Wissenschaften als unhaltbar. Nichtsdestotrotz sind animistische und anthropomorphe Naturauffassungen fester Bestandteil der Lebenswelt moderner Gesellschaften. Solche Naturauffassungen sind unseres Erachtens nicht als Remineszenzen vormoderner Weltbilder zu deuten, sondern vor allem psychologisch-aktualistisch zu erklären: nämlich als primäre, kindliche animistische Symbolisierungen, in denen Naturbestandteile als dem eigenen Ich entsprechend gedeutet werden, bzw. als entwicklungspsychologisch spätere, sekundäre anthropomorphe Symbolisierungen, in denen Gefühle und Stimmungen auf die Natur projiziert werden.[35] Hier ist die Rede von Naturauffassungen, die sich durch objektivierende, naturwissenschaftliche Theorien weder auflösen noch verdrängen lassen. Sie erfassen die Natur als ein werthaftes Gegenüber bzw. eine Mitwelt. Aber die Bedeutungen und Werte, die bestimmte Naturphänomene auf diese Weise erhalten, sind gerade keine an sich gegebenen Eigenschaften dieser Naturphänomene, ihre Werte keine intrinsischen Werte, sondern

[31] Vgl. Peter Schaber: *Moralischer Realismus*. München 1997.
[32] McDowell: Ästhetischer Wert, Objektivität und das Gefüge der Welt, in McDowell (Hg.), *Wert und Wirklichkeit. Aufsätze zur Moralphilosophie*. Frankfurt/M. 2009, S. 179–203.
[33] McDowell: a. a. O., S. 200.
[34] McDowell: a. a. O., S. 202.
[35] Siehe Gebhard: Kind und Natur: Die Bedeutung der Natur für die psychische Entwicklung. 3., überarbeitete und erweiterte Auflage. Wiesbaden 2009.

Schöpfungen des Menschen. Deshalb können wir davon sprechen, dass sich Naturerfahrung und Selbsterfahrung idealiter wechselseitig integrieren.

Die skizzierten animistischen und anthropomorphen Naturauffassungen kann man unter den Typus menschlichen Gefallens an Natur fassen, den Martin Seel[36] als korresponsive Vergegenwärtigung der eigenen Lebenssituation anhand von Natur charakterisiert hat. Diesem Typus, in dem Natur als sinnhaft erscheint, sind auch die viele der symbolischen Bedeutungen von Natur zuzuordnen, die in der Projektion konkurrierender und im Verlaufe der Geschichte sich wandelnder Auffassungen vom Menschen und von Vergesellschaftung auf die Natur gründen. Zu nennen sind hier insbesondere die Schichten von symbolischen Bedeutungen, die Natur im Verlauf der Kulturgeschichte erhalten hat, indem sie in unterschiedlicher Weise als Landschaft und als Wildnis wahrgenommen worden ist.[37] Weitere Formen menschlichen Gefallens an der Natur gründen, wenn man Seels Typisierung folgt, in der Möglichkeit, sich im Blick auf Natur kontemplativ von den Geschäften des Lebens abzuwenden (sinnferne Natur) oder das Sein in der Welt imaginär zu deuten (bildhafte Natur).[38] In der Realität unserer Naturerfahrungen überschneiden sich diese drei analytisch unterscheidbaren Perspektiven auf Natur, die korresponsive, kontemplative und imaginative, in vielfältiger Weise.[39] So gehören zur Existenz auch des modernen Menschen wesentlich zeit-, kultur- und gruppenspezifische Systeme symbolischer Bedeutungen von Natur, vermittels derer wir uns selbst bestimmen.

Die von uns aufgeführten vier Aspekte von Naturerfahrung in der lebensweltlichen Praxis sind in ihrem komplementären Verhältnis zueinander bisher noch nicht erforscht worden. Wir sehen es als Aufgabe an, in einem ersten Schritt das Forschungsgebiet zu sichten und im Rahmen einer wissenschaftlichen Konferenz die Möglichkeiten interdisziplinärer Forschung zu erörtern. Wir gehen davon aus, dass wir mit unserer provokanten Fragestellung *Welche Natur brauchen wir?* eine fundamental-anthropologische Problematik unserer Zeit ansprechen, die durch das weltanschauliche Gerede über Natur als Ressource oder Gefahr für unser Leben nur verdeckt wird. In anderen Worten: Es handelt sich um ein *Schlüsselthema der Geisteswissenschaften*.

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[36] Seel: *Eine Ästhetik der Natur*. Frankfurt/M. 1991, S. 18.

[37] Kirchhoff & Trepl: Landschaft, Wildnis, Ökosystem: zur kulturell bedingten Vieldeutigkeit ästhetischer, moralischer und theoretischer Naturauffassungen. Einleitender Überblick, in Kirchhoff & Trepl (Hg.), Vieldeutige Natur. Landschaft, Wildnis und Ökosystem als kulturgeschichtliche Phänomene. Bielefeld 2009, S. 13–66; Kirchhoff: *"Natur" als kulturelles Konzept*, Zeitschrift für Kulturphilosophie 5 (1): S. (im Druck), 2011.

[38] Seel: *Eine Ästhetik der Natur*. Frankfurt/M. 1991, S. 18, S. 20 und passim.

[39] Seel: a. a. O. , S. 185 ff. Vgl. z.B. Smuda (Hg.): *Landschaft*. Frankfurt/M. 1986;Groh & Groh: *Weltbild und Naturaneignung. Zur Kulturgeschichte der Natur*. Frankfurt/M. 1996; Groh & Groh: *Die Außenwelt der Innenwelt. Zur Kulturgeschichte der Natur 2*. Frankfurt/M. 1996; Fischer (Hg.): Projektionsfläche Natur. Zum Zusammenhang von Naturbildern und gesellschaftlichen Verhältnissen. Hamburg 2004; Drexler: Landschaft und Landschaftswahrnehmung: Untersuchung des kulturhistorischen Bedeutungswandels von Landschaft anhand eines Vergleichs von England, Frankreich, Deutschland und Ungarn. Saarbrücken 2010.

I. 2. Arbeitsprogramm

Das zentrale Anliegen der Konferenz ist die Öffnung und Skizzierung einer Forschungsfrage. Wir heben an mit einer systematischen Untersuchung menschlicher Formen der Naturerfahrung und der Frage, wie sich heutzutage intersubjektiv gültige Werthaftigkeit von Natur und diese als symbolische Sinnordnung konstituiert (vgl. die oben angeführten 4 Aspekte). Die vorangehende Explikation unserer Forschungsidee und des Forschungsstandes zeigt, dass dazu differenzierte Analysen des Mensch-Natur-Verhältnisses aus der Perspektive ganz unterschiedlicher Disziplinen erforderlich sind. Diese Analysen bilden den zentralen *Konferenzblock II. Theoretische Analysen: Natur als Umwelt des Menschen*. Die Erkenntnisse dieser theoretischen Analysen sollen allerdings nicht wissenschaftlicher Selbstzweck sein, sondern in die lebensweltliche Praxis hineinwirken, sodass sie die kritische Reflexion und die demokratische Entscheidungsfindung über (die Weiterentwicklung) der Vielzahl lebensweltlicher Praxen befördern können, die mit Implikationen der Werthaftigkeit von Natur konfrontiert sind. Diesen Anspruch wollen wir ebenfalls auf der Konferenz einlösen: Im *Konferenzblock III. Praxen: Aktuelle Schnittstellen der Diskurse* werden ausgewählte gesellschaftliche Praxen dahingehend analysiert, welche Formen der Naturerfahrung ihnen zugrunde liegen und auf welche Weise in ihnen Werthaftigkeit von Natur explizit oder implizit handlungsleitend ist bzw. konstituiert wird. Der *Konferenzblock I. Standpunkte: Natur als Wertordnung oder Ressource* führt in die Thematik der Konferenz ein, indem der tradierte Werthorizont vorgestellt wird; dieser Rekurs konstituiert einen gemeinsamen Problemhorizont für die theoretischen Analysen und Reflexionen auf die gesellschaftlichen Praxen.

2. Vorläufiges Programm (mit Arbeitstiteln der Vorträge; Disziplinen)

19. 09. 2012/ nachmittags

<u>I. Standpunkte/Positionen: Natur als Wertordnung oder Ressource</u>

Schöpfung bewahren oder verändern? (Theologie)

Natur erhalten oder verbrauchen? (Ökonomie)

Kommentar (Philosophie)

<u>II. Theoretische Analysen der Natur(en): Natur als Umwelt des Menschen</u>

‚Naturzeit' – der Rhythmus des Lebens (Evolutionsbiologie)

‚Kulturzeit' – die Dynamik sozialer Prozesse (Soziologie)

Kommentar (Sozial-ökologische Forschung)

20. 09. 2012/ vormittags

Natur als ‚natürlicher Lebensraum des Menschen' (Biologie/ Ökologie)

Natur als ‚künstliche Umwelt des Menschen' (Kultursoziologie)

Kommentar: (Theologie)

Der innere Erfahrungsraum – die natürliche Wahrnehmung (Medizin/ Neuro-Ästhetik)

Der äußere Erfahrungsraum – die Lebenswelt (Physik/ Wissenschaftsphilosophie)

Kommentar (Philosophie)

20. 09. 2012/ nachmittags

Das objektivistische Verständnis von Natur (Philosophie/ Phänomenologie)

Das subjektivistische Verständnis von Natur (Naturästhetik/ Kunsttheorie)

Kommentar (Landschaftsplanung/ Kulturwissenschaft)

Natur als Raum von Eigenrechten (Theologie)

Natur als Raum der Macht (Geschichtswissenschaft)

Kommentar (Ethik)

21. 09. 2012/ vormittags

Wie wir die ‚Natur' erkennen (Biologie/ Wissenschaftstheorie)

Was die ‚Natur' uns lehrt (Ökologie/ Naturschutz)

Kommentar (Philosophie)

III. Praxen der Natur(en): Aktuelle Schnittstellen der Diskurse

Erziehung in der Natur (Umweltpsychologie/ Umweltpädagogik)

Verantwortung für die Natur (Ökologie/ Natur-Ethik)

Kommentar (Politikwissenschaft)

21. 09. 2012/ nachmittags

Leben mit der Natur (Biologie)

Natur beherrschen – Gesundheit steigern (Gesundheitsökonomie)

Kommentar (Philosophie)

Möglichkeiten der Naturgestaltung (Ökonomie/ Umweltmanagement)

Grenzen der Naturgestaltung (Biophilosophie)

Kommentar (Sozialwissenschaftliche Umwelt-/Nachhaltigkeitsforschung)

Abschlussdiskussion mit allen Teilnehmern/innen: Welche Natur brauchen wir?