

Firole (Pterotrachea sp.),  
1809, watercolor on vellum.  
Charles-Alexandre Lesueur, from:  
*Les Vélins de Charles-Alexandre Lesueur,*  
*Exposition Catalogue*, ed. by Jacqueline  
Bonnemains, Le Havre 1996, Cat. No. 32



## Department II

### Ideals and Practices of Rationality

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Director: *Lorraine Daston*

#### **Introduction: Towards a History of Rationality**

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Since it began work in 1995, Department II has explored the history of forms of rationality in the sciences through a series of projects, including “The Varieties of Scientific Experience,” “Demonstration, Test, Proof,” and “The Scientific Persona.” Each project aimed to bring together a diverse group of scholars (junior and senior, from different specialties and national intellectual traditions) to explore a category of scientific thought and practice that was fundamental to the current understanding of rationality. Three premises informed these projects: first, that even the most central features of scientific rationality (such as “fact” or “objectivity” or “demonstration”) had evolved historically; second, that their history was best pursued by simultaneously attending to both abstract ideas (e. g. philosophical discourses about evidence) and concrete practices (e. g. how scientific images are made and used); and third, that comparisons among historical periods, cultures, and disciplines were essential to such a history.

These premises, especially the last, have shaped the working methods as well as the topics investigated by Department II. Research projects bring together groups of scholars (approximately twenty-five at any given time) who contribute both by single-authored publications, which examine some specific aspect of the topic in depth, and also by collective ones produced by working groups of three to fifteen members, who meet several times to plan, discuss, and prepare articles or chapters for a joint work. All scholars in residence in Department II meet regularly to present and discuss work-in-progress at the bimonthly departmental colloquium and irregularly in ad hoc reading groups and ongoing conversations about shared research interests. The colloquium follows a workshop format, with pre-circulated papers (in English, French, or German) and designated commentators; approximately two-thirds of the papers are by members of the research group; the remaining third are by guests invited because their work is particularly relevant to the themes of the department’s current projects. Moreover, several conferences are organized every year in conjunction with departmental research projects, bringing in additional external participants.

During the period of this *Research Report* (mid-2004 to mid-2006), Department II pursued two major projects, “History of Scientific Observation (2005–8)” and “Knowledge and Belief (2003–5),” as well as two smaller, longer-term research foci, “Between the Natural and Human Sciences” and “Gender Studies of Science.” Three other projects were completed: “The Moral Authority of Nature,” “Common Languages of Art and Science,” and “The Values of Inconsistency.” Reports on these projects follow the forms in which research was organized: working groups, conferences, individual participants (a bibliography of publications listed by author’s name may be found at the end of this volume). Full descriptions of the individual projects can be found on our website.

## Project

## History of Scientific Observation

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DURATION 2005–2008

MPIWG ORGANIZERS *Lorraine Daston, Kelley Wilder*

COOPERATION PARTNERS Freie Universität Berlin, Germany, Staats- und Universitätsbibliothek Göttingen, Germany

There is no science, natural or human, that does not make use of refined practices of observation to identify and investigate its objects of inquiry. Although almost all forms of scientific observation involve a long and arduous training of the senses, learning to look (or smell or hear) is only the beginning of an apprenticeship. Whether the observation in question is the psycho-physicist's detection of reaction times or the anatomist's mapping of the nervous system, novices are schooled in the use of instruments, the co-ordination of eye and hand, and the making of notes and often sketches. Nor does the observation stop there: it must be forged into a description and often a display. Numerical tables, maps, graphs, and stylized descriptions (as in the case of botany) are all part of the craft of performing, not just preserving an observation. In addition to these tools and techniques, there are sites of observation: the astronomical observatory, the anatomy theater, the meteorological balloon, the field of naturalists and anthropologists, the laboratory of psychologists and chemists, the archives of the historian. The history of scientific observation is in many ways the inverse of that of the casual observation: an accumulation of paraphernalia (the collecting jar, the microscope, the chronometer, the notebook), of experiences (the expedition, the vigil, the dissection, the survey), of techniques (staining a microscope slide, pressing a herbarium specimen, deciphering an old script), and, above all, of habits of attention standardized by discipline—all these acquisitions, both of disciplines as they develop historically and of practitioners as they master their craft, render the scientific observation in the highest degree deliberate and specialized.

→ “Working Knowledge and Science, 1780–1870” p. 145

→ “History and Epistemology of Experimentation” p. 90

The history of scientific observation is in part that of instruments, buildings, and records and in part that of less tangible cognitive practices. Especially in its early stages, forms of scientific observation build upon skills and perceptual acuity acquired in other contexts, including the connoisseurship of natural materials possessed by artisans but also the reading practices of the learned. The efforts of early modern naturalists to attend to and register natural particulars bear, for example, a suggestive resemblance to the philological skills they employed as scholars to digest, excerpt, and recover maxims, quotations, and bits of information they discovered in books; the commonplace book was often the repository for interspersed gleanings from both reading and observation.

→ “Materials in the History of Science and Technology” p. 127

Gradually, each scientific discipline acquires a tradition of observation, into which aspiring entomologists or astronomers or historians are initiated; indeed, the double meanings of “discipline” as field of study and molding of mind and body converge

in this process. To learn to observe scientifically is to learn to see certain objects in a certain way and to care about those objects intensely, often to the exclusion of other, more familiar objects of human concern. The selective concentration and hence distraction of the observer are legendary, as the long line of anecdotes about the absent-mindedness of the learned bear witness, starting with the ancient story of Thales' fall into the well. But the private aspects of scientific observation should not be exaggerated. From the outset, the processes of observation are collective, from the calibrated vision of microscopists to the standardized Latin descriptions of botanists to the uniform instruments of an international geodetic expedition.

Observation in the sciences has not only been practiced but theorized, and in strikingly different ways. Sixteenth- and seventeenth-century philosophers of observation, such as Bernard Palissy, Francis Bacon, and Robert Hooke emphasized the danger, difficulty, and tedium of the task; their eighteenth-century successors in contrast portrayed observation as an all-consuming obsession, pursued to the point of blindness. Starting in the nineteenth century, it became customary to oppose, as Auguste Comte and Claude Bernard did, "active" experiment with "passive" observation, a distinction that was nonetheless constantly blurred in scientific practice and was itself a historical by-product of then-emergent doctrines of objectivity. Certain enduring practices, such as the repetition of observations, have received strikingly different rationales: Enlightenment naturalists recommended repeated observations of the same object or phenomenon because the narrow beam of attention picked out different features each time; twentieth-century philosophers of science asserted that it was a precaution against fraud and error. The histories of the theory and practice of observation have yet to be examined in tandem, or even singly.

The research project on the **History of Scientific Observation** continues Department II's ongoing involvement in the history of scientific experience, most recently in the form of the working group on "Historia in Early Modern Europe" organized in 2003 at the MPIWG by Professor Gianna Pomata (Università di Bologna, Italy) and Professor Nancy Siraisi (Hunter College, New York, U.S.A.); the results of this group were published as Gianna Pomata and Nancy Siraisi, eds., *Historia: Empiricism and Erudition in Early Modern Europe* (Cambridge, Mass./London: MIT Press, 2005).

→ "Historical Styles of Experimentation and Observation: *Historia experimentalis*" p. 136

→ "Between the Natural and the Human Sciences" p. 74

As in the case of the "Historia" working group, the **History of Scientific Observation** aims to include practices from both the human and natural sciences, albeit in an enlarged historical and geographic framework.

## History of Scientific Observation

**Working Group**

An international working group of fifteen scholars held its first meeting at the MPI-WG June 27–29, 2006 to plan a collective publication that would trace the fortunes of scientific observation from the late Middle Ages to the twentieth century in the natural and human sciences. Two further meetings are planned, in 2007 and 2008.

**Members**

- *Domenico Bertoloni-Meli* (University of Indiana at Bloomington, U.S.A.)
- *Charlotte Bigg* (MPIWG)
- *Jimena Canales* (Harvard University, U.S.A.)
- *Lorraine Daston* (MPIWG)
- *Michael Gordin* (Princeton University, U.S.A.)
- *Elizabeth Lunbeck* (Vanderbilt University, U.S.A.)
- *Harro Maas* (Universiteit van Amsterdam, The Netherlands)
- *Andrew Mendelsohn* (Imperial College London, U.K.)
- *Mary Morgan* (London School of Economics, U.K.)
- *Katharine Park* (Harvard University, U.S.A.)
- *Gianna Pomata* (Università di Bologna, Italy)
- *Theodore M. Porter* (University of California at Los Angeles, U.S.A.)
- *Anne Secord* (University of Cambridge, U.K.)
- *Mary Terrall* (University of California at Los Angeles, U.S.A.)
- *Kelley Wilder* (MPIWG)

## History of Scientific Observation

**Conferences**

**Observing Nature—Representing Experience. Practices and Concepts 1800–1850**, January 28–29, 2005. In collaboration with the DFG Collaborative Research Center “Aesthetic Experience and the Dissolution of Artistic Limits,” Freie Universität Berlin, Germany.

ORGANIZER *Erna Fiorentini* (Freie Universität Berlin, Germany/ MPIWG)

During the first decades of the nineteenth century, the observation of nature was characterized by a coincidence of the aesthetic and the quantitative. The workshop explored this ambivalence in both art and science, with special attention to the production of images, the individual experience of nature, and the historical relation of observation as simultaneously an act of perception and description. The proceedings will be published in 2007.



**Scientific Observation in the Enlightenment**, October 13–15, 2005,

Georg-August-Universität Göttingen, Germany

In collaboration with the Staats- und Universitätsbibliothek Göttingen.

ORGANIZERS *Lorraine Daston* (MPIWG), *Joachim Migl* (SUB Göttingen),

*Elmar Mittler* (SUB Göttingen)

Observation of almost everything imaginable, from alpine glaciers to exotic peoples to microscopic polyps to grain prices, was the primary scientific activity of the Enlightenment. Whether the object of observation was a faintly luminescent diamond, the entrails of a caterpillar, the daily temperature variations registered by the thermometer, or the marriage customs of South Sea islanders, the act of observation was deemed to be the most important and most difficult task of the savant. In an age acutely conscious of the scientific dangers of the *esprit de système*, observations were held up as the most effective antidote to fanciful hypotheses or preconceived ideas. Because observation revealed nature as it was, without laboratory manipulations or controls, it was considered by many Enlightenment savants to be epistemologically superior to experiment. Across a broad spectrum of the natural and human sciences, savants formed themselves into virtuosi of observation, the Enlightenment scientific practice *par excellence*. This international and interdisciplinary conference examined Enlightenment observation from the standpoint of four themes that cut across the particular sciences: tools and techniques, persona, description, and philosophies.

History of Scientific Observation

**Planned Conferences**

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**Lay Participation in Scientific Observation**, May 31–June 1, 2007.

ORGANIZERS *Susanne B. Keller* (MPIWG), *Jeremy Vetter* (MPIWG/Fairleigh Dickinson University, U.S.A.)



Alexander von Humboldt and Aimé Bonpland in the Plains of Tapia near Mount Chimborazo. Oil on canvas. Friedrich Georg Weitsch, Generalverwaltung Preußischer Schlösser und Gärten Berlin-Brandenburg, Potsdam (Section), around 1810

**Tables: The Taking, Making, and Keeping of Data, 2008.**

ORGANIZERS *Domenico Bertoloni-Meli* (University of Indiana at Bloomington, U.S.A.), *Lorraine Daston* (MPIWG), *Friedrich Steinle* (Universität Wuppertal, Germany)

**Photography as Evidence, 2008.**

ORGANIZER *Kelley Wilder* (MPIWG)



Selbstportrait. Ilse Bing, 1931, Folkwang Museum Essen

## History of Scientific Observation

**Individual Projects**

*Jan Altmann* (Postdoctoral Fellow, Humboldt-Universität zu Berlin, Germany) explored the functions and effects of drawing as a technique of scientific observation on hand from a series of French case studies, ranging from the early years of the Académie Royale des Sciences in the late seventeenth century to Georges Cuvier's palaeontological investigations in the early nineteenth century. To retrace the correlations between eye, mind, hand, and body, the project penetrates to the material basis of the drawing, the repeated strokes on the textured paper from which the finished (or unfinished) image emerges.



Jan Altmann



Salpe [*Cyclosalpa pinnata* (Forskål, 1775)]. Watercolor on vellum, 44 x 29 cm. Charles-Alexandre Lesueur, From: *Baudin in Australian Waters: The Artwork of the French Voyage of Discovery to the Southern Lands (1800–1804)*, ed. by Jacqueline Bonnemains et al., Melbourne: Oxford University Press/Australian Academy of the Humanities, 1988 (Cat. No. 75002)



**Marie-Noëlle Bourguet** (Visiting Scholar, Université de Paris-VII, France) continued her long-term project on the practices of scientific travelers, with a focus on Alexander von Humboldt's notebook from his Italian trip of 1805. Her essay *Écriture du voyage et construction savante du monde. Le carnet d'Italie d'Alexander von Humboldt* appeared as MPIWG Preprint no. 266; her book will be published in 2007.



Brita Brenna

**Brita Brenna** (Postdoctoral Fellow, Universitetet i Oslo, Norway), with the support of the Centre for Technology, Innovation and Culture at the University of Oslo, Norway, studied how Norwegian nature became an object of scientific inquiry, theological contemplation, economic resources, and political significance, with special attention to Erich Pontoppidan's two-volume *The First Attempt at a Natural History of Norway* (1752–53).

**Lorraine Daston** (MPIWG, Director) and Peter Galison (Harvard University, U.S.A.) completed their book *Objectivity* (Zone Books, 2007), which traces the history of epistemic virtues such as truth, objectivity, and judgment on hand from the practices of scientific image-making from the eighteenth to the early twenty-first centuries. Continuing work on the history of observation and attention included in this book and in earlier publications, she has begun an inquiry into the relationship between economies of attention and the cultivation of the scientific self among Enlightenment naturalists.



*Cirrocumulus stratiformis lacunosus.*  
International Cloud Atlas, Vol. 2,  
Geneva, 1987, p. 118

**Emmanuel Didier** (Visiting Scholar, Centre National de Recherche Scientifique, France) completed work on his book on the huge growth of statistical surveys as a form of mass observation in the United States during the interwar period: *Comment les sondages ont exprimé l'Amérique. Une histoire des enquêtes partielles aux Etats-Unis l'Entre-deux-guerre* (INED Press). At the center of the study stands the new method of random sampling, which in turn led to new ways of defining and governing the nation that made the New Deal possible.



Federal Secretary of Agriculture, Henry A. Wallace, signing a statistical crop report. Courtesy National Agricultural Statistical Service, US Department of Agriculture, in the 1930's

**Christelle Gramaglia** (Predoctoral Fellow, École des Mines, Paris, France) completed her ethnographic research on how ecotoxicologists in France and Germany use “sentinel organisms” to detect water pollution. These new observational instruments enroll living organisms into research protocols and offer evidence on the impact of pollutants on organisms and environments that is more immediately connected to the experience of laypeople and professionals (e.g. fishermen) than more conventional forms of scientific data.



Christelle Gramaglia



River sentinel / mollusk *Corbicula fluminea*. J.-C. Massabuau, LEESA.



Erna Fiorentini

**Erna Fiorentini** (Visiting Scholar, Freie Universität Berlin, Germany/MPIWG) examined the role of optical instruments, especially the camera lucida, in the practices of early nineteenth-century scientific observation. Impressed by new discoveries in sensory physiology, these observers could no longer view the eye as a passive screen upon which external reality was projected; they instead attempted to develop the perceptual and epistemic capacities of the eye. Observation and depiction carried out by means of the camera lucida combine objective cognition and subjective judgment, selection, and creation.

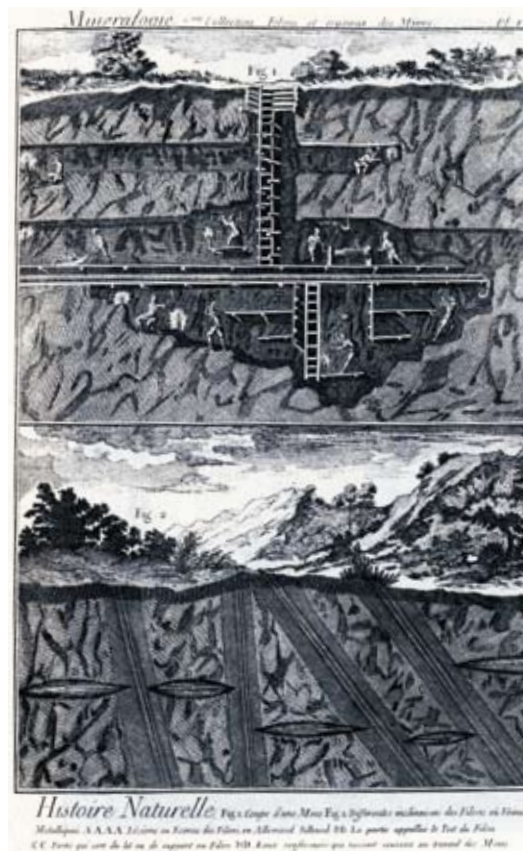


Reverend Calvert Jones (?) sketching with a Wollaston camera lucida (probably a self-portrait done in a mirror). Pencil camera lucida drawing. The National Library of Wales, ca. 1830



Susanne B. Keller

**Susanne B. Keller** (Postdoctoral Fellow, Universität Hamburg, Germany) investigated the visualization of the hidden zone's beneath the earth's surface, from the eighteenth through the twentieth centuries. A major focus of the project is the word-image relationship in illustrated scientific treatises. Questions include: What can be deduced from the surface? What concept of observation does this involve? What is the epistemic value of fragmentary visual information for an understanding of the whole?



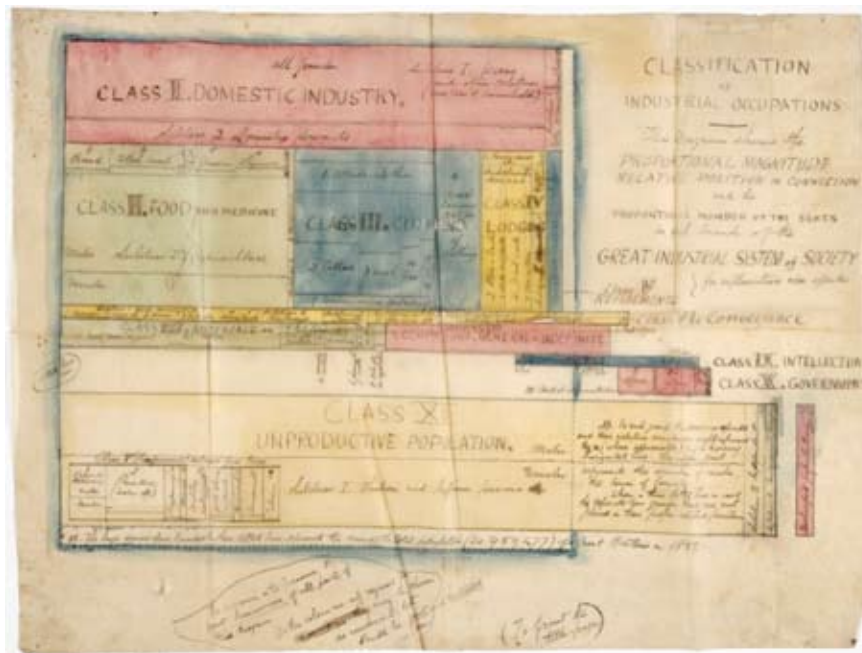
Recueil des Planches, Minéralogie, 7<sup>me</sup> collection, Filons et travaux des Mines, Diderot & Jean Le Rond d'Alembert, *Encyclopédie ou Dictionnaire raisonné des sciences, des Arts et des Métiers*, Paris 1751–1780 (MPIWG, Library)

**Rhodri Lewis** (Postdoctoral Fellow, University of Oxford, U.K.) studied the reception and development of the classic arts of memory (mnemotechnics) in Northern Europe, ca. 1500–1700, especially the way in which mnemotechnics were approached as a set of tools through which one might accurately represent, and think about, the natural world. As the preface of Robert Hooke’s *Micrographia* suggested, memory was one of the internal senses, and if an external sense such as vision could be remedied with eyeglasses, telescopes, or microscopes, then it might be possible to augment the function of memory in a similar way. His book *Language, Mind and Nature: Artificial Languages in England, Bacon to Locke*, is forthcoming from Cambridge University Press.



Rhodri Lewis

**Harro Maas** (Visiting Scholar, Universiteit van Amsterdam, The Netherlands) explored introspection as a mode of observing and theorizing the social world in the context of political economy in the nineteenth and twentieth centuries. Starting with studies of the slave economy of the American South in the 1860s, he follows how mechanical analogies and statistical data came to replace introspection as a mode of empiricism in economics.



Stratigraph of industrial activities of the young Stanley Jevons (and later political economist) based on a hierarchy of human needs. Stanley Jevons’ papers, John Ryland, Library, Manchester, around 1855

**Susanne Pickert** (Predoctoral Fellow, Humboldt-Universität zu Berlin, Germany) examined pre-modern observation in the travelogues of high and late medieval pilgrimages to the Holy Land, focusing on the motivation for detailed observation and description as well as the means of communicating them. To bolster the perceived reliability of their accounts and the clarity of their descriptions, authors applied contemporary concepts of trustworthiness and textual organization. These specifically medieval observation practices were embedded in the topography of Christian remembrance.

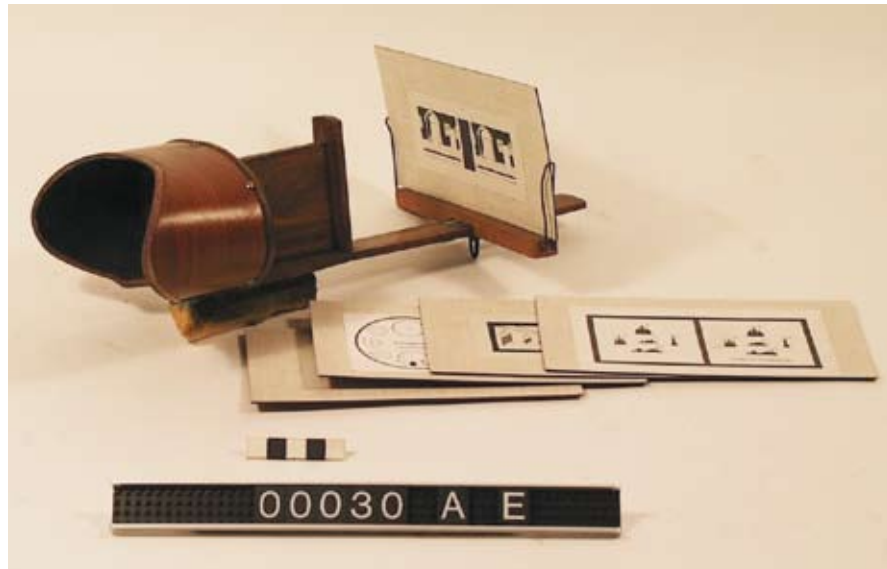


Susanne Pickert



Thomas Sturm

**Thomas Sturm** (Lorenz Krüger Postdoctoral Fellow, Universität Marburg, Germany) pursued a project on how the psychology of perception treated sensory illusions, a topic of enduring interest in optics and astronomy as well as psychology and philosophy. The study attempts to combine a material history of scientific instruments (e. g. Wheatstone's stereoscope of the 1830s) with a history of the methodological and theoretical assumptions that guided psychological investigation of sensory illusions. His essay "The Role of Instruments in Psychological Research" (co-author: Mitchell Ash) was named best article in the journal *History of Psychology* in 2005.



Wheatstone-Stereoscope for the simulation of depth perception. Institute for the History of Psychology, Universität Passau



Margareta Tillberg

**Margareta Tillberg** (Visiting Scholar, Växjö universitet, Sweden), with the support of the Swedish Research Council, investigated the influence and significance of artists' observational techniques on the sciences in one of the major research institutes of the Soviet Union, the All-Union Scientific Research Institute of Industrial Design (VNIITE, established in Moscow in 1962). In an attempt to invent new design methods for the Soviet planned economy, VNIITE came to employ some 10,000 artists, engineers, architects, mathematicians, physiologists, and economists in multi-disciplinary research groups in a vast collaboration of artistic and scientific observation.



Danny Trom

**Danny Trom** (Visiting Scholar, Centre National de Recherche Scientifique, France) studied how German landscapes became an object of public interest (and concern, as potentially endangered) in the late nineteenth century. This shift was less the result of new knowledge or new techniques of visualization than of the collection and redeployment of extant but dispersed knowledge, know-how, and administrative methods to observe, count, and manage landscapes. Scientists especially were called upon by political authorities to define landscape as an objective category, independent of subjective perspective.

**Jeremy Vetter** (Postdoctoral Fellow, University of Pennsylvania, U.S.A.) investigated the region as a useful scale for analyzing the environmental context and work organization of science, focusing on field work between 1860 and 1920 in the United States Great Plains and Rocky Mountains. Modes of field production differed from their laboratory counterparts in seeking a middle ground between the epistemological authority of universality and the practical usefulness of relating to particular regional and local environments and cultures.



Jeremy Vetter



Harold J. Cook, Agate fossil quarry, 1922  
Item 5912.112, Box G, Cook Photograph  
Collection, Agate Fossil Beds National  
Monument, Harrison, Nebraska, U.S.A.

**Marga Vicedo-Castello** (Postdoctoral Fellow, Harvard University, U.S.A.) examined the methods used by early ethologists Niko Tinbergen and Konrad Lorenz to study many different animal species in natural environments, as opposed to the “artificial” setting of the laboratory, as well as their debates with comparative psychologists T. C. Schneirla and D. S. Lehman. Observational tools such as the movie camera, but also observational stances such as subjective identification with the animals figured prominently in these discussions. This study is part of a larger book project on the history of scientific ideas about maternal care and love in the nineteenth and twentieth centuries.



Marga Vicedo-Castello

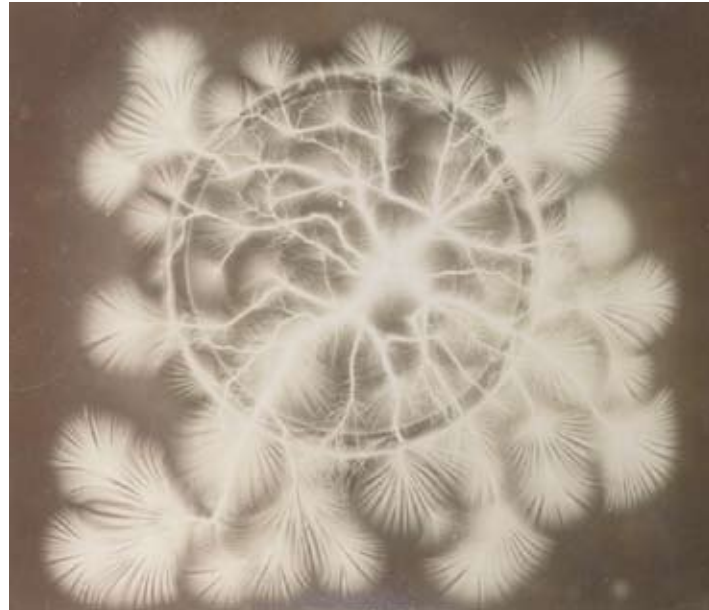


Konrad Lorenz followed by his imprinted  
geese. Niko Tinbergen, around 1938



Kelley Wilder

**Kelley Wilder** (Research Scholar) began a project on the nature of photographic evidence in science. By the late nineteenth century, the photochemical trace (including photography) was providing scientists with innumerable insights into the natural world: photography recorded things that were too small, too fast, too far way, too ephemeral, or invisible to the human eye. The project examines not only how photography was used in the sciences, but also how photography came to be surrounded by the language and rhetoric of science.



Décharge électrique dans un environnement chargé de dioxyde de carbone, aristotype, 17,7 cm x 23 cm. Stéphane Leduc, Université de Nantes, Section Santé, around 1890 From Denis Canguilhem, *Le merveilleux scientifique. Photographies du monde savant en France, 1844–1918*, (Gallimard) Paris 2004, p. 110.



Rafael Ziegler

**Rafael Ziegler** (Predoctoral Fellow, McGill University, Canada), with support from the Canadian Social Science and Humanities Research Council and a McGill Department of Philosophy Dissertation Fellowship, studied the interaction of statistical rationality and the normative demands of an individualist, Kantian ethic on hand from two case studies: the concept of “eco-space” proposed by economists and civil society actors in the 1980s as a way to operationalize sustainable development; and Pareto’s 1896 large-scale study of personal income distribution.

## Project

## Knowledge and Belief

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DURATION 2003–2006

MPIWG ORGANIZERS *Lorraine Daston, Bernhard Kleeberg, Fernando Vidal*

COOPERATION PARTNER Princeton University, U.S.A.

It is a revealing fact that nine out of ten historians of science immediately translate the phrase “Knowledge and Belief” into “Science and Religion.” Although a great deal of history, philosophy, and sociology of science of the past forty years has been concerned with how scientific beliefs are turned into scientific knowledge (or vice versa), conjectures into proofs, heterodoxy into consensus, the problem remains conceptualized as (take your pick) the war between, the peaceful coexistence of, the mutual embrace of science and religion. Moreover, “religion” is overwhelmingly taken to refer to Christianity, indeed more narrowly to Protestantism. The primary aim of this project was to reconfigure the terms in which problems of knowledge and belief are discussed within the history of science.

The precondition for such a reconfiguration is more breadth and comparison among the topics considered under the rubric “knowledge and belief:”

- 1 A wider disciplinary view: As in the rest of the history of science, the focus of most historiography has been on the natural sciences, and on the natural sciences as constituted disciplines (e. g. history of physics, history of biology, etc.). This approach may make sense for some sciences with ancient roots and continuous traditions (e. g. astronomy), but in most cases, the formation of disciplines as intellectual and institutional entities is a nineteenth-century phenomenon. Moreover, classifications of knowledge change over time, and fields now remote (e. g. philology and biology, or music and mathematics) have earlier in their histories been close neighbors. Until the late eighteenth century (and later in some locales) patterns of education and practice tended to promote considerable connectivity among scholarly and scientific fields. In the case of knowledge and belief, there were significant interactions between what are now known as the humanities and the natural sciences about key issues of evidence and proof: e. g. the discussions about the reliability of witness testimony conducted by historians, jurists, theologians, and natural philosophers in early modern Europe (see reports by *Baár*, *Lehmann-Brauns*, and *Perinetti*, below). These were discussions of considerable practical as well as intellectual import: royal successions were legitimated, saints canonized, and experiments validated on the basis of testimony. This is why the research group included members with backgrounds in literature, history, art history, and philosophy as well as history of science proper.
- 2 A wider cultural and chronological view: This is especially important for the traditional core of the study of knowledge and belief in the history of science, viz. science and religion. Two foci of the project attempted to address this desid-

→ “Mental Models in the History of Mechanics” p. 21



eratum. One compares the reception of ancient natural philosophy and mixed mathematics in Islam, Judaism, and Christianity. Despite the continuing sociological (and now, alas, political) interest in the relationship between religion and modernization (especially with respect to science and technology) since Max Weber, there is astonishingly little detailed comparative research on the topic. What detailed research exists on, say, science and Islam is rarely brought into sustained dialogue with analogous research for other cultures and confessions. The other focus looks at the development and uses of natural theology from the Middle Ages through the nineteenth century. Here the problem has been an undifferentiated lumping together of arguments from design from Aquinas through Darwin with scant attention to dramatically altered intellectual and cultural contexts.

- 3 A wider set of questions and ways of answering them: The methods as well as the topics of inquiry into scientific knowledge and belief have heretofore been narrowly conceived. Within studies of science and religion, the chief questions and sources are doctrinal, comparing, e. g., the content of religious articles of faith with that of evolutionary theory. Within knowledge and belief more generally construed, most attention has also been directed to knowledge and belief understood as propositions (e. g. the tenets of phlogiston theory vs. those of Lavoisier's chemistry), with some supplementary interest in evidentiary questions as to how the tenets of one or another scientific hypothesis are proven against its rivals. In the past decade, historians of science have explored the practices as well as the texts of science, but this approach has thus far made little headway into the study of knowledge and belief. The third focus of the research project was to open up new questions (e. g. the epistemological status of dreams: see reports by *Campbell*, *Gantet*, and *Schirrmeister*, below) and new approaches (e. g. the role of the visual in creating, sustaining, and standardizing belief: see report by *Kusukawa*, below). The aim is to modify the meanings of knowledge and belief themselves, understood as epistemological practices as well as propositions assented to.

## Knowledge and Belief

### Working Groups

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Three working groups were formed to address these foci on hand from specific research projects: Before the Revolutions: The Fifteenth Century; Natural Theology; and Epistemology of Belief. Each group met several times at the MPIWG in the course of the project; all three groups came together in common sessions to discuss general issues related to the project and to report on specific work done by each group; some individual members of each group were resident for longer periods at the MPIWG as Visiting Scholars.

#### **Before the Revolutions: The Fifteenth Century.**

MEMBERS *Rivka Feldhay* (Tel Aviv University, Israel), *Jamil Ragep* (University of Oklahoma, U.S.A.), *Wilhelm Schmidt-Biggemann* (Freie Universität Berlin, Germany).

The fifteenth century witnessed major political, religious, and intellectual upheavals that shook authority throughout Europe and the Near East: the fall of Constantinople, the voyages of exploration to the Far East and Far West, the expulsions of Arabs and Jews from Spain, the advent of printing, religious schisms, the rise of humanism and critical historical methods. The working group addressed the impact of these changes on the realignment of the sciences, focusing especially on astronomy, philology, and mathematics in Christian, Jewish, and Islamic contexts. Special attention was paid to cultural relocation resulting from imperial expansion, religious expulsion, travel, and diplomacy, all of which massively influenced scholarly contacts during this period. The working group organized a conference, “Before the Revolutions: Religions, Sciences, and Politics in the Fifteenth Century,” held January 13–15, 2005 at the MPIWG (see *Conferences*, below). A new working group, drawn largely from participants in the conference, will pursue the issues it defined in the context of pre-Copernican astronomy (see *Upcoming Activities*, below).

#### **Natural Theology.**

MEMBERS *Rivka Feldhay* (Tel Aviv University, Israel), *Bernhard Kleeberg* (MPIWG), *Scott Mandelbrote* (University of Cambridge, U.K.), *Joan L. Richards* (Brown University, U.S.A.), *Laura Smoller* (University of Arkansas at Little Rock, U.S.A.), *Fernando Vidal* (MPIWG).

Natural theology (or “physicotheology,” as it was also known in the early modern period) has traditionally been the primary area for discussion of knowledge and belief within the historiography of science. In the tradition of Christianity, natural theology was understood as the demonstration of God’s existence and attributes from the “book of nature” (as opposed to the book of scripture) or from human reason (as opposed to revelation). Although natural theology was most influential in the sciences from the seventeenth through the early nineteenth centuries, its intellectual lineage can be traced back to the Middle Ages and forward to the present. The working group developed a framework for a collection of articles (submitted as a thematic issue of

the journal *Science in Context*) that deliberately reversed the usual historiographic pairings of knowledge with nature and belief with God: “Believing Nature, Knowing God.” On the one hand, knowledge of nature presupposes a moral, emotional, and cognitive attitude of belief in certain epistemic values, in the procedures associated with them, and in the results to which they lead. On the other, natural theological claims about God entail evidentiary and argumentative practices of the sort used to produce knowledge. The articles written by the members of the working group, which span the fourteenth through the nineteenth centuries, aimed to historicize the concepts of knowledge and belief, as well to track the shifting boundary (sometimes blurred) between science and religion.

#### Table of Contents

- *Laura Smoller*, “Astrology and the Sibyls: John of Legnano’s De adventu Christi and the Natural Theology of the Later Middle Ages”
- *Rivka Feldhay*, “Between Knowledge and Belief: Thomas Aquinas’ Discourse von Faith”
- *Scott Mandelbrote*, “The Uses of Natural Theology in Seventeenth-Century England”
- *Fernando Vidal*, “Miracles, Science and Testimony in Post-Tridentine Saint-Making”
- *Joan L. Richards*, “Parallel Universes: Natural Theology and the Power of Reason”
- *Bernhard Kleeberg*, “God-Nature Progressing. Natural Theology in German Monism”

#### Epistemology of Belief.

MEMBERS *Mary Baine Campbell* (Brandeis University, U.S.A.), *Lorraine Daston* (MPIWG), *Arnold I. Davidson* (University of Chicago, U.S.A.), *John Forrester* (University of Cambridge, U.K.), *Simon Goldhill* (University of Cambridge, U.K.).

Epistemological approaches to knowledge and belief are tightly intertwined with questions of evidence, proof, demonstration, confirmation and falsification—all the ways in which beliefs can be probed and tested before they are promoted to the status of knowledge. The standard model assumes that knowledge and belief are related to one another as points along a continuum (or probability values ranging from zero to one). This model implies that knowledge and belief are in most cases fungible: a belief may be promoted to knowledge; erstwhile knowledge may be demoted to belief. According to the standard model, moreover, both knowledge and belief must be formulated as propositions to which one assents or dissents. Ideally, the model demands that these propositions be submitted to the bar of evidence, and it is on this basis that they are to be positioned on the knowledge-belief continuum. None of the features of this standard model are self-evident and many are contested. Historians, philosophers, and sociologists of both religion and science have repeatedly pointed out how poorly the model corresponds to actual practice—and approved practice at that. In the case of science, the rigorous implementation of the model would bring

the whole enterprise to a standstill. Much experimental and even theoretical knowledge is tacit rather than propositional; the division of intellectual labor and the transmission of knowledge depend on trust in colleagues and deference to teachers; even mathematicians do not insist on personally re-proving all theorems before accepting them as knowledge. Philosophers (and scientists themselves) fret about how to reconcile the short lifespan of scientific theories, the to-and-fro movement along the knowledge-belief continuum, with ideals of eternal and immutable truth. So how did the standard model become standard and why does it endure? The aim of the working group was to trace a history of the standard model, criticize its empirical adequacy (especially as an account of knowledge), and outline a possible alternative model that does justice to actual scientific and scholarly practices. The result was a jointly authored article, “Rethinking Knowledge and Belief,” accepted by the journal *Common Knowledge*.

Knowledge and Belief

### Conferences

**Miracles as Epistemic Things**, October 29–30, 2004.

ORGANIZER *Fernando Vidal* (MPIWG)

Drawing inspiration from Hans-Jörg Rheinberger’s concept of “epistemic things” (entities and processes, such as physical structures, chemical reactions or biological functions, characterized, in the context of experimental systems, by the fact that they embody what one does not yet know), the workshop aimed to approach miracles as exemplary objects of both belief and knowledge, to bring miracle-making into the purview of the history of science broadly conceived, and to explore the theme beyond the usual historiographic rubric of “science and religion” and the well-studied 17th- and 18th-century debates on the epistemological and material possibility of miracles. A book based on the conference, edited by Fernando Vidal, has been submitted to Brill for publication.

#### Table of Contents

- *Thomas Wetzstein*, “Proving the Supranatural. Miracles, Sanctity, and Law of Evidence in Medieval and Early Modern Canonization”
- *Laura Smoller*, “Authentic Miracles in Public Form: Canonization and the Authentication of Miracles in the Case of Vincent Ferrer (d. 1419)”
- *Gábor Klaniczay*, “The Construction of Healing in the Age of Medieval Canonization Processes”
- *Gianna Pomata*, “Malpighi and the Holy Body: Medical Experts and Miraculous Evidence in 17th-century Italy”
- *Fernando Vidal*, “Trust, Knowledge, and Miracles in Prospero Lambertini’s Doctrine and Praxis”
- *Bernhard Kleeberg*, “God-Nature Progressing. Natural Theology in German Monism”

*to be continued*

**Table of Contents (Continuation)**

- Nancy Caciola, Moshe Sluhokovsky, “The Discernment of Spirits in Medieval and Early Modern Europe”
- Elisabeth Claverie, “The Work of Testing in Apparition and Its ‘Grammars.’ The Case of Medjgorje”
- Andrew Keitt, “Cutting the Gordian Knot of Spiritual Imposture. Feigned Sanctity in 16th- and 17th-century Spain”
- Arnold Davidson, “Representing the Stigmata: Miraculous Event, Mystical Experience”
- Vittorio Casale, “The Role of Images of Saints and Miracles in Canonization Ceremonies in the Late 17th and Early 18th Centuries”
- Claire Gantet, “Hans Engelbrecht (1599–1642) and the Uncertainty of Protestant Miracles”
- Scott Mandelbrote, “English Protestants and the Meaning of Miracles”

**Before the Revolutions: Religions, Sciences, and Politics in the Fifteenth Century,** January 13–15, 2005.

ORGANIZERS *Rivka Feldhay* (Tel Aviv University, Israel), *Jamil Ragep* (University of Oklahoma, U.S.A.), *Wilhelm Schmidt-Biggemann* (Freie Universität Berlin, Germany)

The conference expanded historical perspectives on fifteenth-century intellectual history to embrace expulsions and migrations outside or on the margins of Europe and developments in all three monotheistic religions on the eve of modernity. Within this more capacious framework, five topics were singled out for special attention: the realignment of the sciences; philology—speculative, critical, and historical; cultural

relocation and reidentification; eschatology and prophecy; and the questioning of authority and the consolidation of diversity.



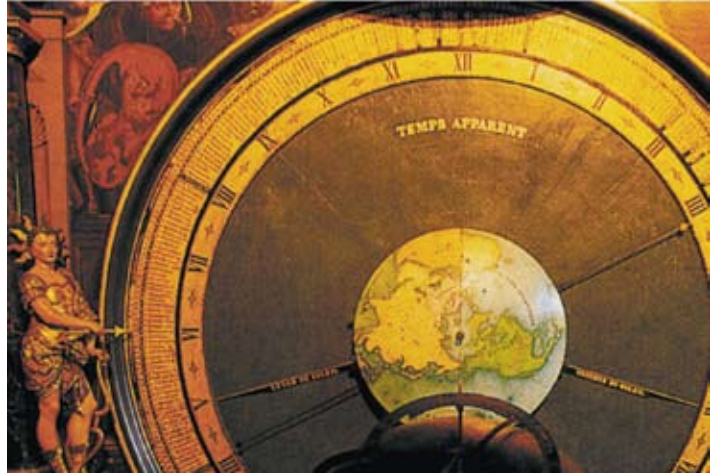
*Cosmographia*. Claudius Ptolemäus, Weltkarten, Reprint, Edition Georg Popp, Würzburg 1977, Table I (section)

### The Destruction of Biblical Chronology between Scaliger and Vico,

August 24–26, 2005.

ORGANIZERS *Anthony Grafton* (Princeton University, U.S.A.), *Sicco Lehmann-Brauns* (MPIWG); in collaboration with the Department of History, Princeton University, and the Andrew W. Mellon Foundation.

During the early modern period, scholars turned new intellectual tools on the traditional chronology of biblical exegesis and universal history. Theological, philological, historical, geological, and astronomical analyses lengthened the timeline step-by-step. New models of universal history rejected the narrow focus on the bible and embraced Chinese and Indian sources. The result was not only the discovery of “deep time,” as Italian historian Paolo Rossi has called it, but also new explanations of the development of the earth and of human civilization. The proceedings of the workshop will be published in the *Journal of the History of Ideas*.



Astronomical Clock, Strasbourg Cathedral, from: Philippe Legin, *Die astronomische Uhr in Bildern*, Colmar 1982

Knowledge and Belief

#### Individual Projects

**Monika Baár** (Postdoctoral Fellow, University of Oxford, U.K.) pursued two projects, both concerned with historiography: how nineteenth-century Central European historians attempted to reconcile scholarly standards with nationalist aspirations (the book manuscript *Historians and the Nation in the 19th Century: The Case of East-Central Europe* has been accepted for publication in the Oxford Historical Monographs series); and the role of fiction in history writing during the Romantic period, especially how forgeries and pieces of literature were incorporated into the historical record.

**Mary Baine Campbell** (Visiting Scholar, Brandeis University, U.S.A.) investigated how dreams were theorized in early modern France and England, societies in the throes of profound cultural revolutions. She plans a book on how dreams came to be excluded from knowledge, including chapters on the fate of metaphor, the dreams of early modern mathematicians, the anthropological displacement of dream activity onto the New World and peasant cultures, and the development of an “oneiric private sphere” in which dream speaks only of private feeling, no longer of privileged access to knowledge.



Rivka Feldhay

**Rivka Feldhay** (Visiting Scholar, Tel Aviv University, Israel) continued work on a book about Jesuit science and cultural fields in early modern Europe. She addressed three main questions: how Jesuits attempted to reconstrue the meanings of science and faith in the sixteenth and seventeenth centuries, using the concepts of Thomist theology but in a context shaped by Reformation- Counter-Reformation polemics; the efforts of Jesuit mathematicians to justify the scientific claims of mathematical disciplines vis-à-vis both natural philosophy and theology; and science teaching in Jesuit schools.

**Claire Gantet** (Postdoctoral Fellow, Université de Paris I, France) researched a book on the debate about the origins and significance of dreams in the Holy Roman Empire, ca. 1500–1750. Dreams alleged to come directly from divine sources circumvented the established churches and therefore represented a potential danger to the authorities. Gradually, dreams were transferred from the province of the theologian to that of the physician, expressions of pathological beliefs rather than revelation. The book will examine how the epistemological (as well as the cultural and political) status of dreams shifted as truth was progressively defined in terms of facts by the late seventeenth century.

**Hannah Ginsborg** (Visiting Scholar, University of California at Berkeley, U.S.A.) completed three articles and revised a fourth, all part of an ongoing exploration of the normativity of nature: empirical concepts, aesthetic experience, and teleology in Kant's *Critique of Judgment*. This distinctive kind of normativity is exemplified paradigmatically in judgments of beauty, but is also at work in the activities of classification and discrimination through which concepts are acquired, and it is indirectly applied in the understanding of the biological world.

**Don Handelman** (Visiting Scholar, The Hebrew University of Jerusalem, Israel) continued a project on how many of the ordinarily transient micro-structures of everyday action can be stabilized as rituals, which often develop greater complexity, self-reproducibility, and permanence. The intention is to formulate many of the micro-practices of both everyday life and ritual as non-reducible to individual agency, with special attention to the bureaucratic logic of modern social orders.

**Sarah Tindal Kareem** (Postdoctoral Fellow, Harvard University, U.S.A.) explored the willing suspension of disbelief in eighteenth-century fiction. Early novelists, including Behn and Defoe, adopt a “strange but true” formula that encourages a twofold wonder in which the reader credulously marvels at the strangeness and at the same time wonders skeptically at the truth-value of the events related. Once the novel makes explicit its fictional nature, the response of wonder transmutes into willing suspension of disbelief, combining reader-responses that draw on the popular lore of wonder and on Enlightenment skepticism.

**Bernhard Kleeberg** (Research Scholar) studied the emergence and transformations of the concept of raising the standard of living in the eighteenth and nineteenth centuries in between different fields of knowledge (economic theory, moral philosophy, social statistics) as well as political and social practices. Since the mid-eighteenth century developmental thought and tendencies toward standardization and normalization made general progress conceivable, contradicting older cyclical theories of wealth. Yet, political measures to raise the standards were only taken up slowly, since they were mainly defined in moral terms—as provident behavior. Besides preparing publications he co-organized an HSS-session and a conference on the topic. In addition, he has been working on natural aesthetics and theology. In 2005 his study on Ernst Haeckel was published that served as a basis for his work in the working group on natural theology.



Bernhard Kleeberg

**Sachiko Kusakawa** (Visiting Scholar, University of Cambridge, U.K.) pursued a book project on the use of pictures in scholarly studies in the Renaissance, particularly the double role of pictures as proof and persuasion in botany and anatomy. Pictures simultaneously established new knowledge of nature and persuaded audiences to form “fides oculata.” During her stay at the MPIWG, she focused her research on Swiss botanist Conrad Gesner’s use of images in the making of knowledge.



*Historia plantarum*. Conradi Gesneri, Aquarelle aus dem botanischen Nachlass von Conrad Gessner (1516–1565) in der Universitätsbibliothek Erlangen, Faksimile Edition, ed. by Heinrich Zoller et. al., Zürich: Urs Graf (1972–1980), Vol. 1, Table 25



**Laurent Loty** (Visiting Scholar, Université Rennes II, France) undertook research in the archives of the Berlin-Brandenburgische Akademie der Wissenschaften on the 1753 debate sponsored by the Akademie on optimism, a political philosophy of submission in the Enlightenment: if we already live in the best of all possible worlds, what is the point of reforms? This manuscript study contributed to an ongoing project on the Enlightenment political imagination, especially the role of utopias.

**Scott Mandelbrote** (Visiting Scholar, University of Cambridge, U.K.) prepared several articles on the uses of early modern natural theology and also on the reception of Isaac Newton’s writings (the subject of two conferences he has co-organized for 2006 and 2007). He also completed an article on the scientific and medical libraries of early modern Britain, which appeared in the MPIWG Preprint Series in 2005.

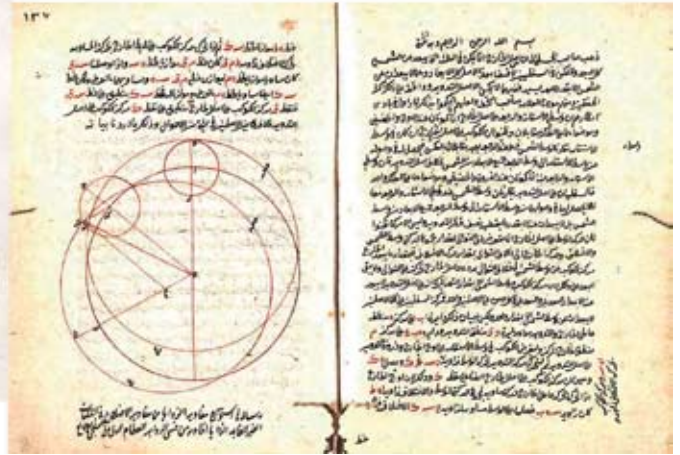
**Sicco Lehmann-Brauns** (Postdoctoral Fellow, Freie Universität Berlin, Germany) analyzed eighteenth-century methods used to examine the fringes of history, both the remote past of prehistory and the remote future end of history. These methods evolved in the context of a transition from biblical chronology to new dating systems based on new kinds of evidence—philological, antiquarian, astronomical. Interest in the beginning and endpoints of history spawned a new discipline: the philosophy of history.

**Dario Perinetti** (Visiting Scholar, Université du Québec à Montréal, Canada) examined how early modern debates on the nature of historical knowledge triggered sustained philosophical reflection on how testimony-based beliefs are formed and can be justified. Two articles resulted: “Moral Certainty and Empirical Knowledge in the Early Modern Period,” and “History and Logic in the Eighteenth Century.” Both will eventually also form chapters of a book on *Philosophical Reflection on the History in the Enlightenment*.



Portrait of Menasseh ben Israel, engraving. Salom Italia, Courtesy of Rijksmuseum Amsterdam, ca. 1642

**Sina Rauschenbach** (Visiting Scholar, Martin-Luther-Universität Halle-Wittenberg, Germany) explored knowledge and intercultural exchange in seventeenth-century Judaism on hand from the career of Menasse ben Israel (1604–1657), who won the respect and friendship of prominent Christian members of the Republic of Letters and who served as a mediator between Christianity and Judaism. This research is part of a larger project on the early modern intellectual.



Comparison of diagrams. Left: J. Regiomontanus and G. Peurbach, *Epytoma joannis in monte region in almagestum ptolemaei*, Venice 1496; Right: Ali Qushji, *Fi ama asl al khari*, Carullah, MS 2060, f. 137a. History of Science Collections, University of Oklahoma Libraries; Süleymaniyeye Library, Istanbul

**Jamil Ragep** (Visiting Scholar, University of Oklahoma, U.S.A.) continued work on the relationships between Islamic astronomers to their early modern European counterparts, especially Copernicus. Two articles resulted from this research, one of which, “Copernicus and His Islamic Predecessors,” will be republished in the *Journal for History of Astronomy* in 2007 at the editor’s request in order to reach a wider audience. He also launched, with Sally Ragep, the Islamic Scientific Manuscript Initiative (see *Upcoming Events*, below), which is supported by the MPIWG IT group.

**Joan L. Richards** (Visiting Scholar, Brown University, U.S.A.) investigated knowing and believing as defined and lived by several generations of an English family in the late eighteenth and nineteenth centuries: the Frennd-De Morgan family. The successive generations of this family wrestled with the meaning of reason for mathematics, religion, politics, spiritualism, and the family. Although family traditions were creatively adapted to changed historical circumstances, the commitment to the unity of knowing and believing remained firm.

**Albert Schirrmester** (Postdoctoral Fellow, Universität Bielefeld, Germany) investigated dreams and knowledge in early modern societies with attention to the changing legitimation of dreams as knowledge, using examples drawn from the work of Michel de Montaigne (1533–1592), René Descartes (1596–1650), and Blaise Pascal (1623–1662). The blurred boundary between daydreaming and nocturnal dreams opened up the possibility of fusing the traditional prophetic and visionary authority of dreams with the new individual, more corporeal account of dreams, as in meditations.

**Mark Seltzer** (Visiting Scholar, University of California at Los Angeles, U.S.A.) explored models of mass public belief and scientific truth via the matter of modern crime in the nineteenth and twentieth centuries. “True crime” is the crime fact that looks like crime fiction, inhabiting a twilight zone between reality and fiction created by the modern mass media. The book *True Crime* will be published by Routledge in fall 2006.

**Daniel Stolzenberg** (Postdoctoral Fellow, Stanford University, U.S.A.) worked on two projects: Athanasius Kircher and the discovery of Egyptian antiquity, and amulets as evidence in the historicization of magic by early modern European scholars. Kircher’s attempts to decipher Egyptian hieroglyphics were utterly mistaken, but they ushered in the erudite orientalist tradition of the seventeenth century. Amulets had long been on interest in the context of magic, but around the turn of the seventeenth century a different kind of amulet literature emerged that was not primarily interested in how to use them, but instead treated them as evidence of ancient civilizations.



A “Gnostic” amulet. From the Magical Amulet Collection of the Taubman Medical Library



Udo Thiel

**Udo Thiel** (Visiting Scholar, Australian National University, Canberra) continued a book project on the notions of self-consciousness and personal identity in eighteenth-century German, French, and British philosophy. The book aims both to give an intellectual history of the subject and also to situate these developments in historical context, with special attention to the history of science and theology.

**Koen Vermeir** (Predoctoral Fellow, Katholieke Universiteit Leuven, Belgium) completed a dissertation on early modern medical and natural philosophical theories on the power of the imagination to influence not only mind but also body. His stay at the MPIWG was financed by a grant from the Fund of Scientific Research—Flanders.



Frontispiece of Robert Fludd's book on mnemonics that was part of his *Utriusque cosmi* (1617–1619). One can see a stylised depiction of the ventricles of the brain, corresponding to imagination, cogitation and memory. The 'eye of the imagination' in the front ventricle is depicted in its contemplation of mnemonic images.

**Catherine Wilson** (Visiting Scholar, University of British Columbia, Canada) investigated the revival of Epicurean materialism in seventeenth-century metaphysics, natural philosophy, and political and moral theory, as well as its contribution to the formation of an empiricist approach to the knowledge of nature and of experimental practice.

## Ongoing Projects

# Between the Natural and the Human Sciences

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Current classifications of knowledge that divide the disciplines up depending on whether they study the natural or human realms do not do justice to either historical or contemporary interactions among the natural and human sciences. Department II has a longterm commitment to the investigation of these interactions, at the levels of shared scientific concepts, practices, and epistemological categories.

## Between the Natural and the Human Sciences

### Cooperations

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“The Cerebral Subject. The Impact of the Neurosciences in Contemporary Society:” Collaboration between the MPIWG (coordinator: Fernando Vidal) and the Universidade do Estado do Rio de Janeiro/UERJ, Brazil (coordinator: Francisco Ortega), financed by the German Academic Exchange Service (DAAD).

“The History of the Human Sciences:” Collaboration between the MPIWG (coordinator: Lorraine Daston) and the University of Chicago, U.S.A. (coordinators: Robert J. Richards, Alison Winter), financed by both parties.

## Between the Natural and the Human Sciences

### Conferences

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**Facts**, December 14, 2005. In collaboration with the London School of Economics, U.K.

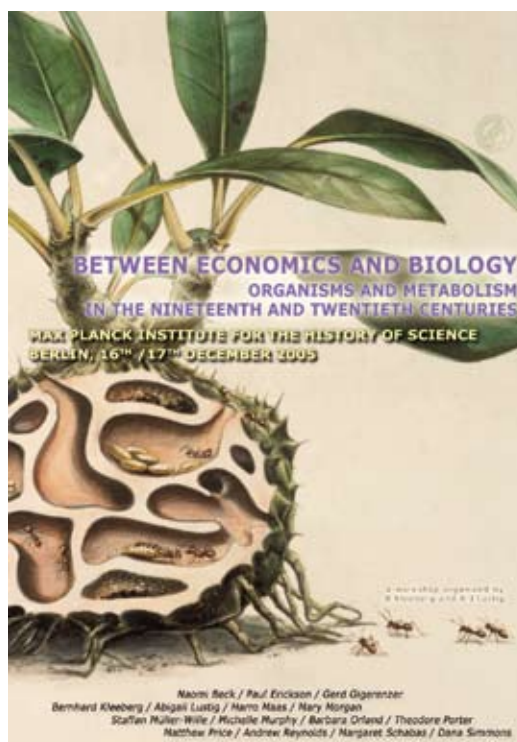
ORGANIZERS *Bernhard Kleeberg* (MPIWG), *Mary Morgan* (London School of Economics, U.K.)

This one-day workshop brought together case studies drawn from the natural and human sciences as the basis for a discussion of the shared epistemological category of the fact.

**Between Economics and Biology: Organisms and Metabolism in the Nineteenth and Twentieth Centuries**, December 16–17, 2005.

ORGANIZERS *Bernhard Kleeberg* (MPIWG), *Abigail Lustig* (University of Texas at Austin, U.S.A.)

Since Aristotle's description of the *oikos*, ideas of human and natural economies have been linked. Metaphors, ways of understanding, standards of judgment, epistemic practices, and models have moved freely among moral philosophy, theology, the physico-mathematical and the physiological sciences, natural history, anthropology, political economy, and biology. This conference focused on a key area of exchange between economics and the biological sciences: concepts of the organism and its metabolism.



Between the Natural and the Human Sciences

**Planned conferences**

**The Neurosciences and Contemporary Society**, Rio de Janeiro, Brazil, August 2–4, 2006. Organized in the framework of the DAAD-supported project “The Cerebral Subject.” Financed by MPIWG, the State University of Rio de Janeiro, the Brazilian CAPES and FAPERJ, and the Instituto Bennett of Rio de Janeiro, with additional support from ETH Zurich, Switzerland, and the Institute for the History of Medicine and Public Health of the University of Lausanne, Switzerland.

Website: <[www.brainhood.net](http://www.brainhood.net)>

ORGANIZERS *Francisco Ortega* (Universidade do Estado do Rio de Janeiro, Brazil), *Fernando Vidal* (MPIWG).

**On Knowing in the Human Sciences**, August 24–25, 2006. In collaboration with the “History of the Human Sciences” cooperation.

ORGANIZERS *Lorraine Daston* (MPIWG), *Robert J. Richards* (University of Chicago, U.S.A.), *Alison Winter* (University of Chicago, U.S.A.).

**On the Responsibilities of the Human Sciences**, October 20–21, 2006, University of Chicago. In collaboration with the “History of the Human Sciences” cooperation and the Franke Center for the Humanities, University of Chicago.

ORGANIZERS *Lorraine Daston* (MPIWG), *Robert J. Richards* (University of Chicago, U.S.A.), *Alison Winter* (University of Chicago, U.S.A.).

## Between the Natural and the Human Sciences

### Individual Projects

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**Bethania Assy** (Visiting Scholar, Universidade do Estado do Rio de Janeiro, Brazil) studied how the sixteenth-century authority of natural human rights has been transformed in post-Holocaust legislation concerning “crimes against humanity.” She focused especially on the impact of new biotechnologies on the notion of human rights.

**Naomi Beck** (Predoctoral Fellow, Université de Paris I, France) completed a dissertation on the reception and transformation of Herbert Spencer’s evolutionary theories in France and Italy. Spencer’s theories came to inspire diverse and even opposed social, economic, and political doctrines as the context changed.



Luciana Vieira Caliman

**Luciana Vieira Caliman** (Predoctoral Fellow, Universidade do Estado do Rio de Janeiro, Brazil), supported by a DAAD dissertation fellowship, researched a dissertation on the inattentive individual as an object of scientific inquiry in two historical periods, the second half of the nineteenth century and the last third of the twentieth century. The first part centers on the work of psychologists and philosophers; the second, on that of physicians and psychiatrists in defining and diagnosing new “attention deficit disorders.”



Illustration from the famous German children’s story “Zappel-Phillip”. First published in 1844

**Doris Kaufmann** (Visiting Scholar, Universität Bremen, Germany) examined the significance of primitivism as a conceptual framework or figure of thought during the emergence of the interdisciplinary *Kulturwissenschaften* in Germany in the early twentieth century. Two questions made primitivism central: first, the problem of explaining the origins and processes of “other” modes of thought; and second, that of recognizing them by researchers steeped in European modes of thought and perception.

**Maria Cristina Franco Ferraz** (Visiting Scholar, Universidade do Estado do Rio de Janeiro, Brazil), supported by a DAAD fellowship, continued her project on the modernization of perception in the nineteenth century, with special attention to the influence of physiological optics, psychology, neurology, and philosophy.

**Michel Ferrari** (Visiting Scholar, University of Toronto, Canada) studied the history of psychology as understood as the “science of consciousness,” from the mid-nineteenth century through the advent of computer models in the 1950s and the rise of the neurosciences in the 1990s.

**Luciana Kind** (Visiting Scholar, Universidade do Estado do Rio de Janeiro, Brazil), supported by a DAAD fellowship, examined the impact of the definition of death as brain death in the 1960s on the somatic limits of self and personhood.

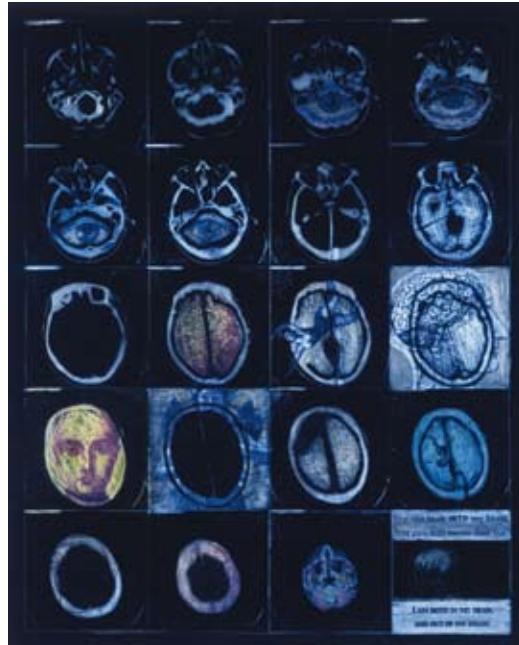
**Abigail Lustig** (Rathenau Postdoctoral Fellow, University of California at Berkeley, U.S.A.) investigated the history of debates over and explanations of altruism in evolutionary theory in the nineteenth and twentieth centuries. In the course of this period, the meaning of altruism has shifted from an ecstatic extension of empathy (Herbert Spencer) to the calculation of rational advantage through kin selection (W. D. Hamilton).

**Amos Morris-Reich** (Predoctoral Fellow, The Hebrew University of Jerusalem, Israel) supported by a dissertation fellowship from the Minerva Foundation, researched a dissertation on the race concept of Arthur Ruppin, first professor of Jewish sociology at the Hebrew University, within the context of both German Rassenkunde of the 1920s and '30s and American cultural anthropology of the 1920s.

**Dorothea von Mücke** (Visiting Scholar, Columbia University, U.S.A.) completed a project on Goethe’s concept of metamorphosis in botany and zoology and his experimentation with various forms of authorship as he sought out an audience for his scientific work. She also formulated a new project on “Authorship and the Order of Nature. Models of Creativity and Originality in the Arts and Sciences in the Eighteenth Century.”



**Francisco Ortega** (Visiting Scholar, Universidade do Estado do Rio de Janeiro, Brazil) supported by a DAAD fellowship, investigated the cerebral subject in popular culture in the nineteenth and twentieth centuries on hand from three cases: (1) the history of brain fitness and neurobics; (2) the relationship to spiritualism; and (3) portrayal in literature.



Susan Aldworth,  
“Cogito Ergo Sum I” (2001)  
(brain scan, gold leaf and collage  
on paper, 350mm x 430mm)

**Wolfgang Schivelbusch** (Visiting Scholar) pursued a project on the concept of consumption in physiological and economic thought, 1770–1870, with a focus on the actual material interaction between the consuming subject and the consumed object. Both political economy and physiology understood the production of commodities to be one not only of transformation, but also of the destruction of the elements consumed.



Fernando Vidal

**Fernando Vidal** (Research Scholar) completed a book on the sciences of the soul in the sixteenth through the eighteenth centuries, variously expressed in logic, anthropology, physiology, and empirical psychology: *Les Sciences de l’âme, XVIIe–XVIIIe siècles* (Paris: Honoré Champion, 2006; English translation forthcoming from the University of Chicago Press). Vidal continued work on his ongoing project on “Brainhood,” the identification of the self with the brain. From science fiction to neurophilosophy and the medical practices of intensive care and organ transplantation, humans in the late twentieth century often came to be treated as not merely having a brain, but as being a brain. This is part of a much longer history, stretching back to Christian theological doctrines about the resurrection of the body, that elaborates the relationship between body and self, posing the question: What is the part of the body we need in order to be ourselves?

## Gender Studies of Science

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MPIWG ORGANIZERS *Christine von Oertzen, Annette Vogt*

The analytical category of gender comes close to being an anthropological universal, structuring almost all known cultures—their economies, politics, institutions, and thought systems. Historically, science has been no exception. Department II supports a number of studies on this topic on an ad hoc but long term basis.

Gender Studies of Science

### Individual Projects

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**Delphine Gardey** (Alexander von Humboldt Foundation Fellow, Centre National de Recherche Scientifique, France) researched a book on *The Female Body and Technoscience in the West during the Twentieth Century*, which compared French, British, American, German, and Dutch literature on the impact of contraception, new reproductive technologies, and new surgical techniques on women. She also continued work on a book about the intellectual tools and administrative technologies that made possible the rise of business technology and management: *Writing, Adding, Filing, and Computing Technologies from the End of the Eighteenth Century*.

**Christine von Oertzen** (Research Scholar) explored the forging of a transatlantic world of science and higher learning in the twentieth century and its lasting impact on Germany from a gendered perspective. By founding the International Federation of University Women (IFUW) in 1919, American and British University women funded the international exchange of female scholars and scientists, both teachers and students, a program with considerable impact on Central Europe. The comparative study historicizes concepts of academic identity and traces transnational cultural transfer in academic affairs.



Christine  
von Oertzen



International Convention of the IFUW 1932 in Edinburgh. Marching to the opening ceremonies, with the Mayor of Edinburgh and the President of the University of Edinburgh. Archive of the British Federation of University Women, London

**Hannah Lotte Lund** (Coordinator of the Research Network on the History of Scientific Objects) is completing a dissertation on the Jewish salon in Berlin circa 1800. Theoretically, in a time when women and Jews were excluded from almost any public career or forum, a salon provided an opportunity to participate in intellectual discourse of the time. In practice, Berlin Jewish salonières had access to rare books, participated in scientific experiments, and were inspired to write and publish on their own.



Annette Vogt

**Annette Vogt** (Research Scholar) completed a book on women scientists in Germany from 1899 to 1945, with special attention to developments after 1933, on hand from two long terms studies of women scientists, at the University of Berlin and at the Kaiser Wilhelm Institutes: *Vom Hintereingang zum Hauptportal? – Lise Meitner und ihre Kolleginnen an der Berliner Universität und in der Kaiser-Wilhelm-Gesellschaft* (Stuttgart: Franz Steiner Verlag, 2006).



Lise Meitner in the laboratory. Archive of the Max Planck Society, Berlin, 1931

## Completed Projects

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Since 2004, the results of several past departmental research projects have been published (or are currently in press). A brief summary of these follows.

### Completed Project

#### The Values of Inconsistency

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DURATION 2003–2005

MPIWG ORGANIZER *Lorraine Daston*

COOPERATION PARTNER Max Planck Institute for Collective Goods, Bonn, Germany

This collaboration between the MPIWG and the Max Planck Institute for Research on Collective Goods in Bonn, funded by the Max Planck Society's special fund to promote interdisciplinary initiatives, assembled a group of jurists, social scientists, philosophers, and historians to discuss the inevitability and perhaps desirability of various forms of inconsistency—including incoherence, contradiction, unpredictability, incompatibility, dissonance, irrationality, *akrasia*, and unacceptable compromise—in law, science, and everyday life. The results of these discussions, held at conferences in 2003 and 2004, were collected in Lorraine Daston and Christoph Engel, eds., *The Values of Inconsistency* (Baden-Baden: Nomos Verlag, 2006).

### Completed Project

#### Natural Law

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DURATION 1999–2005

MPIWG ORGANIZERS *Lorraine Daston, Sophie Roux, Friedrich Steinle*

COOPERATION PARTNERS Max Planck Institute for European Legal History, Frankfurt am Main, Germany, Universität Bern, Switzerland

Early modern Europe witnessed the efflorescence of a discourse of natural laws in both jurisprudence and natural philosophy. This project, the result of a collaboration between the MPIWG and the Max Planck Institute for European Legal History in Frankfurt a. M., brought together a group of historians of early modern law, science, philosophy, and theology to explore connections between the rise of natural law in these various disciplines. Three authors' workshops were held to present, discuss, and revise chapters of a collective volume: Lorraine Daston and Michael Stolleis, eds., *Natural Laws and Laws of Nature in Early Modern Europe* (Aldershot: Ashgate, in press).

## Completed Project

# The Moral Authority of Nature

DURATION 1999–2001

MPIWG ORGANIZERS *Lorraine Daston, Fernando Vidal*

The final publication of this project appeared, the results of a workshop on anthropomorphism held at the MPIWG in 2001:

Lorraine Daston and Gregg Mitman, eds., *Thinking with Animals: New Perspectives on Anthropomorphism* (New York: Columbia University Press, 2005).

### **Table of Contents**

- *Wendy Doniger*, “Zoomorphism in Ancient India: Humans More Bestial than Beasts”
- *Lorraine Daston*, “Intelligences: Angelic, Animal, Human”
- *Paul S. White*, “The Experimental Animal in Victorian Britain”
- *Elliott Sober*, “Comparative Psychology Meets Evolutionary Biology: Morgan’s Canon and Cladistic Parsimony”
- *Sandra D. Mitchell*, “Anthropomorphism and Cross-Species Modeling”
- *James A. Serpell*, “People in Disguise: Anthropomorphism and the Human-Pet Relationship”
- *Cheryce Kramer*, “Digital Beasts as Visual Esperanto: Getty Images and the Colonization of Sight”
- *Gregg Mitman*, “Pachyderm Personalities: The Media of Science, Politics, and Conversation”
- *Sarita Siegel*, “Reflections on Anthropomorphism in The Disenchanted Forest”

Completed Project

## Common Languages of Art and Science

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DURATION 2001–2003

MPIWG ORGANIZERS *Lorraine Daston, Mechthild Fend, Anke te Heesen*

COOPERATION PARTNER Harvard University, U.S.A.

→ “The Experimentalization of Life: Configurations between Science, Art, and Technology” p. 92

Common Languages of Art and Science

### **Working Group**

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The working group on Things that Talk, consisting of historians of art and science, met three times in the course of the project to plan, write, and revise a collective volume on how scholarship about things can combine accounts of matter and meaning:

Lorraine Daston, ed., *Things that Talk: Object Lessons from Art and Science* (New York: Zone Books, 2004).

#### **Table of Contents**

- *Lorraine Daston*, “Speechless”
- *Joseph Leo Koerner*, “Bosch’s Equipment”
- *Antoine Picon*, “The Freestanding Column in Eighteenth-Century Religious Architecture”
- *M. Norton Wise* and *Elaine M. Wise*, “Staging an Empire”
- *Simon Schaffer*, “A Science Whose Business Is Bursting: Soap Bubbles as Commodities in Classical Physics”
- *Joel Snyder*, “Res Ipsa Loquitur”
- *Lorraine Daston*, “The Glass Flowers”
- *Peter Galison*, “Image of Self”
- *Anke te Heesen*, “News, Paper, Scissors: Clippings in the Sciences and Arts Around 1900”
- *Caroline A. Jones*, “Talking Pictures: Clement Greenberg’s Pollock”

Common Languages of Art and Science

**Individual Projects**

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Zeynep Çelik

**Zeynep Çelik** (Predoctoral Fellow, CASVA Fellowship, Massachusetts Institute of Technology, U.S.A.) “Kinaesthetic Impulses: Space, Performance, and the Body in German Architecture, 1870–1914.”



Exterior view of Elvira Photography Studio. August Endell, Munich, 1898



Mechthild Fend

**Mechthild Fend** (Research Scholar) examined the human skin as both a representational problem within the visual arts and as a scientific object in late 18th- and 19th-century France. The latest result of her research is the completion of a book manuscript on the issue of fleshtones in art. It is a collected volume coedited with Daniela Bohde, entitled *Weder Haut noch Fleisch. Das Inkarnat in der Kunstgeschichte*, due for publication at Deutscher Kunstverlag Berlin in fall 2006.

**Thomas Odell Haakenson** (Fulbright Predoctoral Fellow, University of Minnesota, U.S.A.) “The Uncultured Eye: Vision, Culture, and the Modern Grotesque.”

**Kristen Haring** (Postdoctoral Fellow, Harvard University, U.S.A.) “Technical Hobbies—Technical Culture.”

**Anke te Heesen** (Research Scholar) completed her book on newspaper clippings in art and science: *Der Zeitungsausschnitt. Papierobjekt der Moderne* (Frankfurt am Main: Fischer 2006). In her comparative case studies on the clipping collections of the physicist Ernst Gehrcke from Berlin, the Hamburgian Archive of World Trade, and the artist Kurt Schwitters in Hannover, she traces the paths of the paper-object through different, but contemporaneous areas.

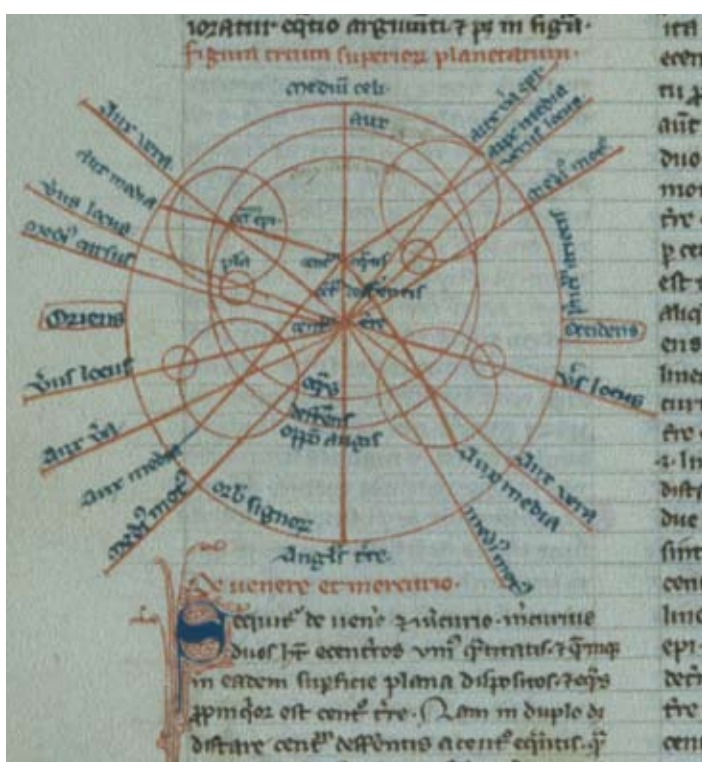


Anke te Heesen

**Kathrin Müller** (Predoctoral Fellow, Universität Hamburg, Germany; Gerda-Henkel and Evangelisches Studienwerk Dissertation Fellowships) “Visual Appropriation of the World: Astronomical and Cosmological Diagrams in Latin Manuscripts of the Eleventh to Early Fourteenth Centuries.”



Kathrin Müller



*Figura trium superiorum planetarum:* Diagram showing the movement of the planets Saturn, Jupiter and Mars. *Theorica planetarum.* Anonymous, Oxford, Bodleian Library, MS Laud Misc. 644 (1487), fol. 117v. Bayeux, 1268–74

**Anna Somfai** (Visiting Scholar, Central European University, Hungary) “The Nature, Role, and Transmission of Diagrams and Diagrammatic Images in Early Medieval Manuscripts of Philosophical, Scientific, and Encyclopedic Texts.”

**Ashley West** (Predoctoral Fellow, University of Pennsylvania, U.S.A.; David E. Finley Fellowship, Center for Advanced Study in the Visual Arts, Washington, DC) “Visualizing Knowledge: Prints and Paintings by Hans Burgkmair the Elder (1453-1531).”

**M. Norton Wise** (Visiting Scholar, University of California at Los Angeles, U.S.A.) “Bourgeois Berlin and Laboratory Science.”



## Upcoming Events for 2006

*Islamic Scientific Manuscript Initiative (ISMI)*, first meeting of the Advisory Board, September 18–19, 2006.

ORGANIZERS *Lorraine Daston* (MPIWG), *Jamil Ragep* (McGill University, Canada), *Sally Ragep* (McGill University, Canada)

The Islamic Scientific Manuscripts Initiative (ISMI) is an international collaborative project that makes available an online resource on the exact sciences in the premodern Islamic world. Providing information on the social, religious, intellectual, and political contexts in which this material was produced as well as its influence on other cultures, it is accessible without charge to researchers in the field and to the public worldwide. The database includes works of 1700 scientists (astronomers, mathematicians, physicists, geographers) who span the entire Islamic world, from the 8th to the 19th centuries. The staff of researchers, technicians, and consultants works closely with an international advisory board and institutional affiliates. Institutional support is provided by the Max Planck Institute for the History of Science, Berlin, and the Institute of Islamic Studies, McGill University, Montreal.

### Advisory Board Members

- *S. M. Razaullah Ansari* (Muzammil Manzil Compound, Aligarh, India)
- *François Charette* (Universität Frankfurt am Main, Germany)
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- Aga Khan University, London, U.K.
- Archimedes Project, Harvard University, U.S.A.
- Universitat de Barcelona, Spain
- Encyclopaedia Islamica Foundation, History of Science Department, Tehran, Iran
- Institute for the History of Arabic Science, Aleppo University, Syria
- Institute for the History of Science and Technology, Moscow, Russia
- The Institute of Ismaili Studies, London, U.K.
- University Library Leiden, The Netherlands
- Warburg Institute, London, U.K.
- The Written Heritage Research Center, Tehran, Iran

*Before Copernicus*, first meeting of working group, December 13–15, 2006

→ “Knowledge and Belief” p. 61

ORGANIZERS *Rivka Feldhay* (Tel Aviv University, Israel), *Jamil Ragep* (McGill University, Canada)

The working group will explore the background to and context of Copernicus’ *Commentariolus*, including not only astronomy, but also eschatology, theology, calendar reform, court politics, early humanism, natural philosophy, and art. A collective publication is planned.

#### Members

- *Nancy Bisaha* (Vassar College, Poughkeepsie U.S.A.)
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- *Raz Chen-Morris* (Bar Ilan University, Israel)
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