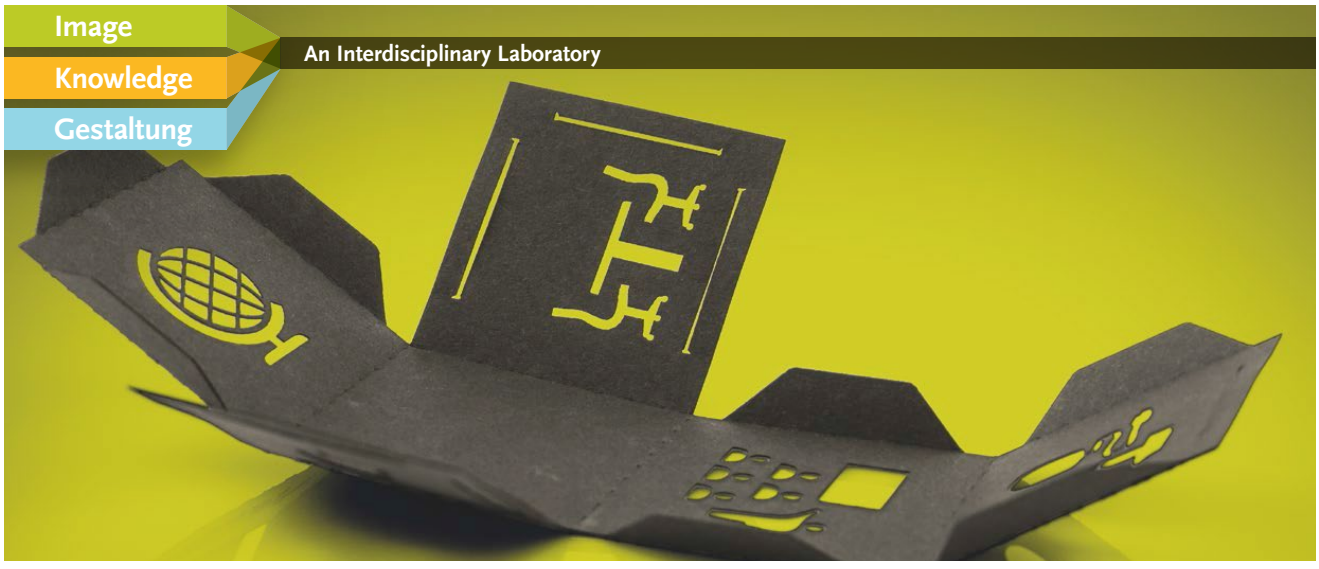
An Interdisciplinary Labory Cluster of Excellence of Humboldt-University zu Berlin

Image Knowledge Gestaltung

Newsletter #2

March 2014

Editorial



The *Interdisciplinary Laboratory*'s cube with the Cluster's specially designed pictograms (Layout: Kerstin Kühl | BWG 2013)

Dear Readers,

The Interdisciplinary Laboratory *Image Knowledge Gestaltung* ended the last – and its first – year with two exhibition projects. They dealt with questions relating to the use of images in different disciplines and how to design a freestanding flexible exhibition system. The latter was the work of Julia Blumenthal, Head of the *Interdisciplinary Laboratory* Workshop, in collaboration with the *Stiftung Neue Synagoge Berlin – Centrum Judaicum* for the »From Inside to Outside. The November 1938 Pogroms in Diplomatic Reports from Germany. 75 Years After the Pogroms« exhibition. It was opened on 11 November 2013 to great public interest and will run until 11 May 2014 (p. 26).

The »Shaping Knowledge« base project dealt with the disciplinary use of images and presented interviews with *Interdisciplinary Laboratory* research scientists in the »Speaking Images – Speaking of Images« exhibition at the beginning of December 2013. Eleven scientists each presented three images with which they work and that are of importance for their respective disciplines (p. 27). In addition, the exhibition's curator, Thorsten Beck, described in an interview how the project had originated and reported on his scientific observations of what was happening in the cluster.

From the wealth of *LunchTalk* presentations we have once more sought to put together for you a selection that illustrates both the thematic and the disciplinary diversity of the *Interdisciplinary Laboratory*. In this issue you can read about isomorphology, Gestalt psychology, augmented operations in medicine, and phylogenetic analysis of art, to name but a few (pp. 4–19).
As part of the *Interdisciplinary Controversy* specialists in theatre studies, psychology, mathematics, literature and cultural studies have in recent weeks discussed »experiment« and »code« (pp. 24–25). We would now like to draw your attention to the events we are holding in the weeks and months ahead, and especially to the *Interdisciplinary Laboratory's* first lecture series entitled »Structures | Tissues | Surfaces« that will begin in the summer semester of 2014. On every other Wednesday, from 6 to 8 pm, the shape and visibility of surfaces and structures are to be investigated in their natural, textile, art and cultural history contexts. Venue: Lecture Theatre 2.07, Dorotheenstr. 26. The next newsletter will be published in May 2014.
We hope you find this newsletter to be informative and entertaining reading.

Claudia Lamas Cornejo
Head of Public Relations & Fundraising

The *LunchTalk* in the *Interdisciplinary Laboratory*

The *LunchTalk* in the *Interdisciplinary Laboratory* is held weekly from 12.30 to 2 pm on Tuesdays. External persons may attend on request. (Photo: Claudia Lamas Cornejo | BWG 2013)

LunchTalk in the *Interdisciplinary Laboratory* is a constant in the cluster week. On Tuesdays from 12.30 to 2 pm, members of the cluster or invited speakers give a talk on relevant topics. Cluster members then discuss the lecture in order to identify points of reference, interfaces, or differences from their own work in the cluster. The *LunchTalk* provides members with an opportunity for informal exchange of information and discussion of issues arising from their own research in a protected internal area.

Here they can air theses and findings that are not yet 100% ready to go into print for discussion by scientists in different disciplines. That is why the *LunchTalk* is not, in principle, open to external persons. If you are interested you can send an inquiry to bwg.publicrelations@hu-berlin.de. Suggestions for contributions by external speakers can also be sent to this address.

Claudia Lamas Cornejo
Head of Public Relations & Fundraising

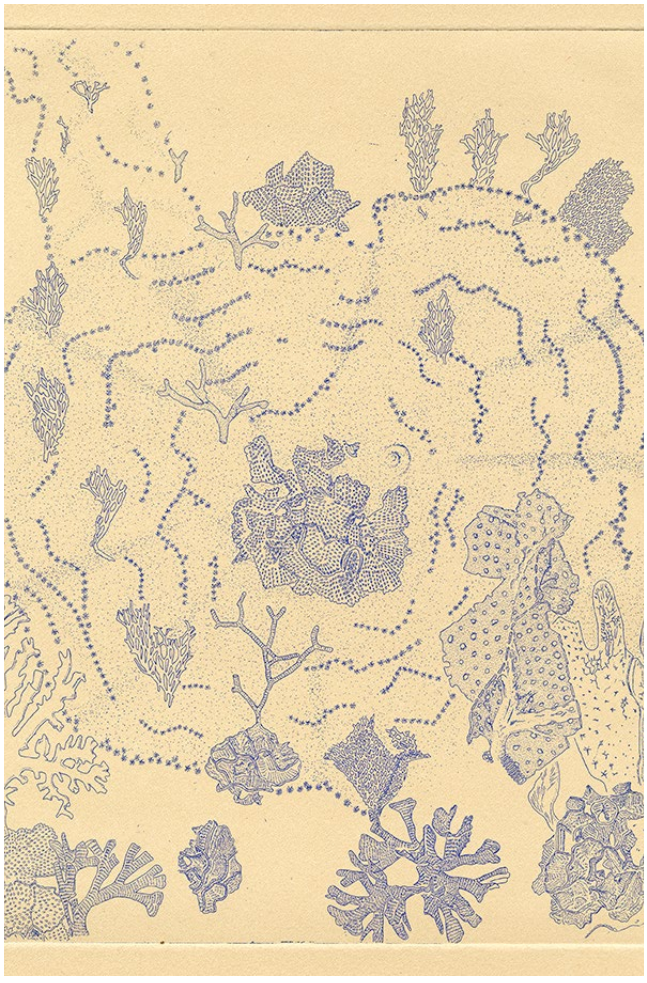
LunchTalk Reports

Isomorphology, 10.09.2014

»Leaf Blue« (Copyright: Gemma Anderson)

Isomorphology[1] is the comparative, drawing-based method of enquiry into the shared forms and symmetries of animal, mineral and vegetable morphologies. Gemma Anderson discussed how extensive research and collaboration with the Natural History Museum and Imperial College has developed the concept and practice of Isomorphology. The drawing process itself is intrinsic to the epistemological value of Isomorphology and can be understood through the following principles: Observation, Trained Judgment and Abstraction. Goethe's (1749–1832) concepts of »Delicate Empiricism« and of the »Ur-Phenomena« are of particular relevance to the development of the theory of Isomorphology. A methodology which incorporates both artistic and scientific methods, Isomorphology reaches beyond conventional scientific understanding, and critiques the contemporary system of scientific order. It operates to liberate form from the confines of traditional scientific classification, to abstract form and to relativize that abstraction. In developing the skill of abstract thinking it is possible to unlearn the conventions of classification that are inherited and to observe afresh, to form an individual understanding and to discover relations between objects previously unperceived. The discussion was about the creative possibilities of Isomorphology in both artistic and scientific contexts.

[1]Etymology, from Greek: Isos | »Same/Equal«, Morphe | »Form«, Logos | »Study«



»Hyperbolic Brown«. Copyright: Gemma Anderson.

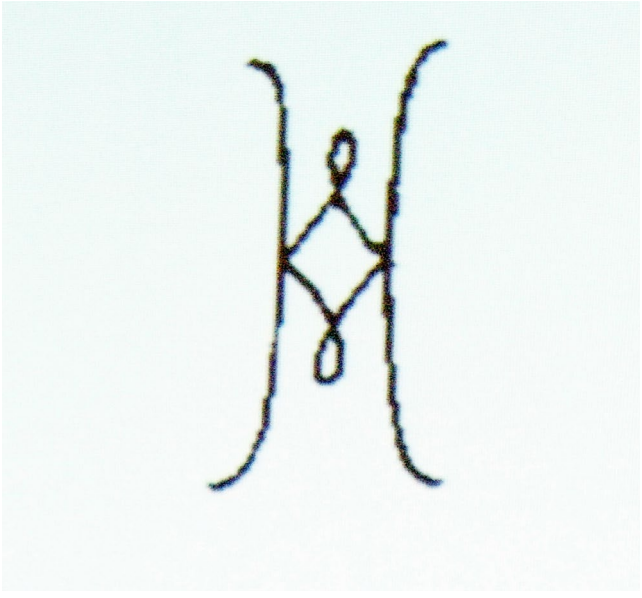
»Five Fold Red«. Copyright: Gemma Anderson

Gemma Anderson (*1981, Belfast, lives and works between London and Cornwall) has won several awards, including the Leverhulme Artists in Residence Award 2012–13, residency at Acme Studios Fire Station in London, Engineering and Physical Science Research Council Award 2011, Wellcome Trust Arts Award 2009, RHA Thomas Dammann Award 2009, Arts Council Purchase Award 2009 and Man Group Drawing Prize Winner (Royal College of Art) 2007. Anderson's work is held in the collections of the V&A Museum, Natural History Museum London, Wellcome Trust and Royal College of Art. Since 2011, Anderson is a PhD candidate at the University of the Arts in London, where she has developed the Isomorphology project as part of her graduate research.

www.gemma-anderson.co.uk
www.isomorphology.com

Gestalt psychology, 03.09.2013

Robert Gaschler presented players in Gestalt psychology.
(Photo: Claudia Lamas Cornejo | BWG 2013)



»Illustration #35« by Max Wertheimer
(Photo: Claudia Lamas Cornejo | BWG 2013)

Both for the food served with the *LunchTalk* and for the words and images in the lecture and debate the question was whether the whole is anything other than the sum of its parts. This statement was the core of the *LunchTalk* on 3 September 2013 in which Robert Gaschler presented a number of old and current players and ideas of Gestalt psychology. His starting point was two letters or an ornament. In 1938 Max Wertheimer noted that it was by no means a matter of course that many people saw his »Illustration #35« as an ornament. Most adults had, after all, gained a millionfold experience of the letters W and M. In keeping with everyday opinion, he argued, many theories of psychology assumed (too) readily that seeing was determined mainly by experience. Quite apart from the fact that the example cited seemed to contradict this assumption, it was not sufficiently clear exactly what experience was. From the Gestalt psychology perspective the illustration makes it clear that basic grouping principles appear to influence the perception of what we see much more strongly than (previous) experience of specific images.

An idea central to Gestalt psychology is the emphasis on relations. Gestalt can often be recognised in that something retains its essential properties even if the underlying elements are changed or exchanged – as long as the relations remain the same. We can recognise melodies, for example, when they have been transposed into another key, the notes having changed but the relations between them having remained largely constant. To illustrate that the focus on relations is by no means a matter of course, classical and current work was presented during the lecture that sought to break down the human consciousness (e.g. Titchener, 1998) or mind (e.g. Anderson, 2002) into underlying elements. In the 1920s and until the early 1930s Wolfgang Köhler, Kurt Lewin, Tamara Dembo, Bluma Wulfowna Zeigarnik and others at the University of Berlin worked on subjects such as perception, thinking and problem solving, memory and action planning from the Gestalt psychology perspective. They were largely responsible for defining this perspective. The Berlin psychologists' original favourite journal, »Psychological Research/Psychologische Forschung,« has survived to this day and can be consulted online from its first year of publication, 1922 (see below for further sources of material).

The further elaboration of Gestalt psychology was made more difficult by, for one, forced emigration. On the other hand many important stimuli from Gestalt psychology, such as that humans can understand relations better in maths exercises (cf. Köhler, 1959) contributed toward the »cognitive turning point« in psychology – and were then absorbed. A further difficulty was the Gestalt principles

of perception were often felt to be somewhat imprecise and arbitrary. The long list of Gestalt principles (grouping by proximity, grouping by similarity, ...) could above all be used to find a plausible explanation for a perception process in retrospect. Testable predictions were not possible. Current work in Gestalt psychology, such as Kubovy & van den Berg, 2008, counter this criticism by saying that they focus on the principles of grouping by proximity and grouping by similarity and model perception processes mathematically in order to be able to test quantitative predictions.
It was stressed in the discussion that elements and relations were inconceivable without one another and that Gestalt psychology and elementaristic positions even faced each other in court – when in court proceedings the originality of industrial design is at issue.

Robert Gaschler
Associated Member

Sources

Anderson, J. R. (2002). Spanning seven orders of magnitude: A challenge for cognitive modeling. Cognitive Science, 26, 85-112, PDF at http://act-r.psy.cmu.edu/publications/pubinfo. php?id=101

Köhler, Wolfgang. (1959). Gestalt psychology today. American Psychologist, 14, 727-734. [Köhler's APA Presidential address.] http://psychclassics.yorku.ca/Kohler/today.htm

Kubovy, M. & Van den Berg, M. (2008). The whole is equal to the sum of its parts: A probabilistic model of grouping by proximity and similarity in regular patterns. Psychological Review, 115(1), 131–154

Titchener, Edward B. (1898a). The postulates of a structural psychology. Philosophical Review, 7, 449-465. [Major statement of Titchener's structuralist school.]
http://psychclassics.yorku.ca/Titchener/structuralism.htm

Wertheimer, Max. (1938). Laws of organization in perceptual forms. In W. Ellis, W (Ed. & Trans.), A source book of Gestalt psychology (pp. 71-88). London: Routledge & Kegan Paul. (Original work published in 1923 as Untersuchungen zur Lehre von der Gestalt II, in Psychologische Forschung, 4, 301-350.)
http://psychclassics.yorku.ca/Wertheimer/Forms/forms.htm

Resources

Psychologische Forschung / Psychological Research
http://link.springer.com/journal/426
Adolf Würth-Zentrum für Geschichte der Psychologie
www.awz.uni-wuerzburg.de/
Classics in the history of psychology
http://psychclassics.yorku.ca/
Neurotree
www.neurotree.org/
Optische Täuschungen, Michael Bach
http://www.michaelbach.de/ot/index-de.html
Current work includes, for example, Michael Kubovy
http://people.virginia. edu/~mk9y/

Augmented Operations. How Image Agents Intervene in the Relationship Between Doctor and Patient, 01.10.2013

This lecture demonstrated by means of the »Da Vinci« surgical system's media production conditions how imaging changes the relationship between view and imagery and how that destabilises the difference between reality, imagination and fictionality. The original idea was that imaging not only addresses problems at the level of artefacts but also increasingly intervenes in the fundamental reference values of the system of perception. It creates perception situations that can neither be categorised as direct experience nor described solely as the product of a temporally or spatially downstream record or recording.

Visualisation practices are increasingly establishing themselves in clinical practice that intervene directly in the medical treatment process and in surgical processes as guiding elements at the interface between doctor and patient (1). Minimally invasive surgical robots exemplify how images shape this interface. A striking initial feature of this kind of surgery is that there is no longer any direct visual contact with the operation area. What the surgeon looks at is no longer seen directly but imagined, no longer seen but visualised. This is accompanied by a series of visualisation problems for clinical practice because surgery must here be undertaken on the basis of imaging.

This intervention in the order of what is visible comes with a dimension of imagery in which visual artefacts are interposed between the previously direct relationship between the human eye and the patient's body. Visual access thus no longer takes place within the anthropological, physical limits of vision but via a three-dimensional depiction on two small screens at which the surgeon looks through two small apertures in the system's control panel. To control the robot he must therefore apply a visualisation to the patient's body that is a not to be underestimated process of abstraction requiring a high level of visual competence. Three robot arms controlled by a complex mechanism take the place of the surgeon's hands. The surgeon operates an instrument with each hand and at the same time navigates with the camera (a so-called stereo video endoscope) by means of foot pedals.
In view of this media arrangement the surgeon must draw inferences from the position of the two instruments in the picture as to the position and movement of his hands and simultaneously synchronise the movements of his feet with the camera's field of vision.

A verifying glance from the screen to the hands that are guiding the instruments, in other words a synchronisation of image and body, is no longer possible and, indeed, no longer provided for by the Da Vinci control system.

This mechanisation of visual practice would seem to indicate that the forms of our perception are no longer conceivable solely in terms of the body and the senses. The computerised image thus not only competes with looking directly but also creates a break or rift between physical sensation and media operation, between organism and mechanism, between eye and recording. The surgeon can use the technology to get to grips with the body in the truest sense of the term but is at the same time obliged to distance himself from it.

In view of the image regimes that imaging processes such as the »Da Vinci system« establish, surgeons today no longer operate solely on human bodies but also on, with and by means of forms of image in which medical intervention is defined and imparted medially. The variation in modalities of visibility that this involves moves the surgeon from a direct and exclusive world of perception to a world of imagination. Doctors must now not only be image-competent in diagnosis; images are increasingly shaping treatment. In other words, it is no longer enough to recognise an illness on the basis of a correspondingly theory-based image knowledged by means of medical visualisation. In imaging-based surgery visualisation practices are increasingly guiding, controlling and shaping treatment, thereby establishing a changed relationship between doctor and patient, between body and image, between humankind and technology. The curricula of medical training have yet to provide a correspondingly changed and application-related visual knowledge, however. The »Image Guidance« base project would like to offset this imbalance by means of a structured programme and at the same time to provide a stimulus for incorporating the transformation of clinical practice by means of digital imaging as an integral part of medical training in the long term.

Moritz Queisner
Base Project »Image Guidance«

The Power of Reduction, 08.10.2013

Fig. 1: Reinhard Wendler, Das Modell zwischen Kunst und Wissenschaft, Munich 2013.

Fig. 2: Fischli & Weiss, »Beliebte Gegensätze: Klein & Gross«, from: Fischli & Weiss, Plötzlich diese Übersicht, Zurich 2011.

Two months ago my book »Das Modell zwischen Kunst und Wissenschaft« was published (Fig. 1). It is an attempt to bring the model to the fore from behind the theories and shed light on it in its dimension as a cultural technique. That is why it is about material and material waywardness, interplay of encouragement and limitation, the concept of modelling – as power as it is unclear –, interaction of several models, the intricate relationship between models and images, and the role of model theory (1). Classical model theory of the 20th and 21st centuries confronts the incredible abundance of aspects and phenomena of the cultures of models with brief and catchy definitions. We often read, for example, that the model is a representation of a reference object, be it an illustration, an abstraction, a simplification or an idealisation, etc. From the vantage point of art history these general definitions are not in a resilient relationship with their reference object, not least because they keep quiet about the extent of what they keep quiet about. So we must first and foremost establish the role of short formulas of this kind.

It is hard to say in general what a model is because models can invalidate conceptual definitions. That indeed is one of the foremost qualities. The object to be defined resists definition, as it were, including definition of the model. An earthenware model by Fischli & Weiss exemplifies this. Taken from a series entitled »Plötzlich diese Übersicht« (Suddenly this Overview), it is entitled »Beliebte Gegensätze: Klein & Gross« (Beloved Contrasts: Small & Large) (Fig. 2). The object suggests that we can here get to grips with the relationship between small and large by means of the earthenware model's reduction in size. But it actually torpedoes this expectation on two levels: on that of the object depicted because the mouse is the same size as the elephant and its tree trunk and on that of the object itself because in the reduced-size model the »beloved contrast« between small and large is not clarified but instead presented in all its surprising complexity. This turn of events can be applied as a model to many other models. Their quality often lies not in a reliable answer but in the questions to which it gives rise.

A second reason why models are so hard to grasp is their scaling. Gaston Bachelard writes in his poetics of space that »I own the world all the better the more skilfully I can make it into a miniature. But one must bear in mind that values become faster and more compressed in the miniature« (2). This compression and acceleration of values is not, however, for the most part continuous. György Kepes, for example, described scaling as an interference phenomenon of continuity and discontinuity. Paul Valéry outlined this relationship more precisely in his dialogue »Eupalinos or the Architect« as follows: »Everything changes with size. [...] If a certain property of a thing grows in an arithmetical ratio, the others change in another way« (3). Valéry describes the complex interplay of one continuous and several discontinuous transformations. As the different properties of a thing are inter-related, scaling destabilises the balance of factors, leading partly to spasmodic distortions. That is why scaling has traditionally enjoyed a reputation – or notoriety – for being impalpable and uncontrollable across the disciplines. That makes it both a transdisciplinary phenomenon and a meeting point of disciplines, as Claus Pias noted some years ago.

The transdisciplinarity of the problems of scaling is exemplified by looking into experiments in different areas to describe the acceleration and compression of values by scaling them down. Alton DeLong, for example, describes in his 1981 »Science« essay »Phenomenological Space-Time: Toward an Experiential Relativity« the following experiment. Test persons were asked to spend half an hour moving small figures through scale models of buildings. The models were on a scale of 1:6, 1:12, and 1:24. DeLong states that the test persons' perception of time was accelerated by the same ratio. Working with the 1:6 scale model the players evidently felt the half hour was over after five minutes, working the 1:12 scale model in two and a half minutes, and so on (4). DeLong sees the result of the experiment as demonstrating that the so-called compression rate of time perception was directly proportionate to the scale model. This experiment is not deserving of mention for its results, which are obviously the consequence of the specific experiment set-up and the expectations engendered by the questions. But it can be understood as an expression of interest in capturing in a formula the compression and acceleration of values in miniature.

This interest is also shown in the use of scale models of cars, trains, aircraft and spaceships in films. As Sarine Waltenspül demonstrates in her Zurich master's thesis, the formula used is to film scale models at a frame rate that is greater by the root of the scale of the reference object to the model (5). This formula formulates a kind of cinematographic similarity theory by stating which rate of slow motion is to be applied to which model scale to create the impression of similarity in the eyes of the viewers. Waltenspül notes that authors usually relativise the validity of this formula because the interplay of model scale und frame rate opens up an extensive scope for possibilities. A slight variation in even one of the many factors involved opens up a wide range of possible aesthetic effects. The formula thus merely takes up one of countless different and equally valid possibilities and assigns to it the status of a standard. »Abstraction may be risked brazenly as long the fact that it is an abstraction is remembered« (6). These are the words of Hans Vaihinger in his »Philosophie des Als Ob« (Philosophy of the As If). If this status is forgotten, it obscures the fact that it is an aesthetic decision, an act of Gestaltung in the expanse of possibilities of interplay between scale model and frame rate.

The situation is similar in aerodynamics. If the scale model of an aircraft is tested in a wind tunnel, the wind speed must be changed in relation to the model scale. One of the many formulas used in this connection states that the airflow velocity of the wind must be increased by the same extent that the model is reduced in size (7). As in the contexts previously mentioned it is customary among experts to refer to the limited validity of such formulas. Numerous so-called scaling effects frustrate the continuity suggested by the formula. These scaling effects are caused inter alia by the compressibility of the air at even relatively low wind speeds. These three attempts to describe the acceration and compression of values in miniature resemble each other at three levels of which the first is that of the complexity of the object under investigation or Gestaltung.

The second is the level of the formulas that are taken into account. Their similarity conveys the impression that the perception of time, the perception of similarity in the film and the behaviour of the wind are subject to comparable laws. The third is the level of the relationship between the problem and the approach to its solution. All three formulas quite ostentatiously undercut the complexity of the processes they purport to make comprehensible. Their media presence, meaning their mathematical brevity and clarity, does not express the simplicity of these phenomena. They are pragmatic fictions in the meaning

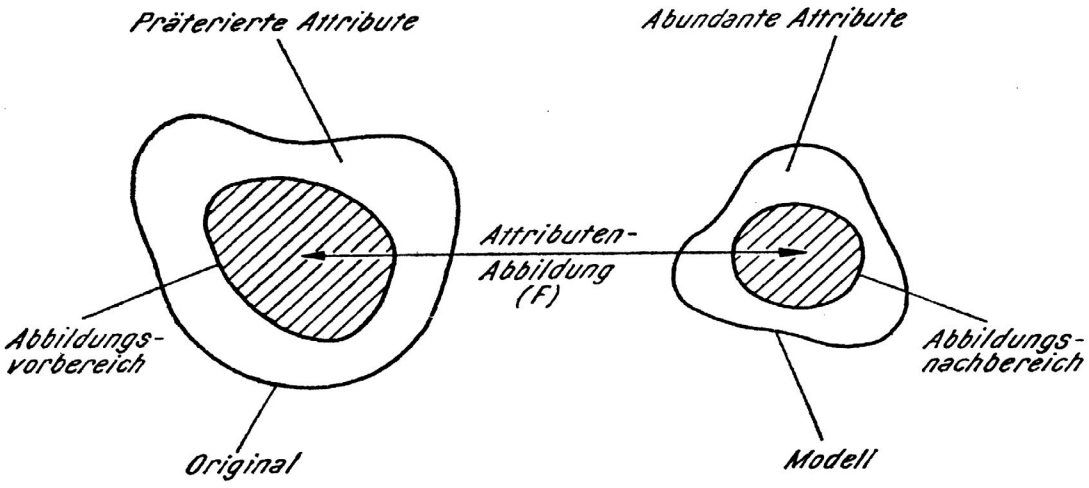


Fig. 3 Diagram taken from: Herbert Stachowiak, Allgemeine Modelltheorie, Vienna, New York, p. 157.

of the term coined by Vaihinger. They are understood to be valid descriptions of the matter as if it were then under control and as if they were standards that one nearly had to observe in order to arrive at usable conclusions.

They are conception acts as one might say on the basis of Bernd Mahr's model of conception (8) and with reference to the speech act and the picture act. Conception acts of this kind make specific changes to the performance of the interplay of formula, objects and observer. They convey, for example, the impression of overview and orientation and with it a stimulus to action, a reference object and a guiding force. So although the term »similarity theory« includes the word »theory«, it would appear to be more appropriate to regard formulas of this kind as components of aesthetic and epistemological practice by which the dynamics of the situation is changed. A theory of scaling that is really deserving of the name would have to deal with the confusion of these action elements with theoretical basics and instead record the role of conception acts of this kind in interplay with their reference object. Much the same applies to classical model theories such as have been discussed by the theory and philosophy of science since the 1940s.
Take, for example, this diagram from Herbert Stachowiak's 1973 so-called General Model Theory (Fig. 3). It shows the isomorphic, or to be more exact: icomorphic, relationship between the reference object and the model in the form of two fried eggs connected by a double arrow. These kinds of views of the model as an image, representation, abstraction, simplification, etc. are pragmatic fictions and as such belong to the practice of models in scientific, technical and artistic disciplines.

An object in a model conception is seen as if it were a representation, abstraction or simplification, ignoring programmatically that in many cases no such relationship can be proven. With this very nonchalance an object conceived as a model can be imputed to be a representation, a model, an example, a rule, an ideal etc., and can thus change the structure of interaction in other ways. Scaling too is to be found in the arsenal of conception acts in the culture of models. To conceive of a model as a reduction of a reference object is in a certain way to bring into play the complex and unpredictable tectonics of scaling.

So-called classical model theories are thus not theories but originally elements from practice, conception acts that have their place in practical work on a scientific issue, a technological development project or in an artistic dispute. A model theory that is truly deserving of the name must seek to record the effects of such actors in interplay with the object, seen as a model. That cannot be accomplished without exemplary investigation. To modify a quotation from Ludwik Fleck one could say that every theory created in this area without historical and comparative investigation »remains an empty play on words, an epistemologia imaginabilis« (9). This applies in particular to the scale model's object of enquiry in which two comples fields come together in the object and exponentiate their effects and aspects. That is why research on the force of reduction in the model has to rely on the concrete and the exemplary mode.

Fig. 4: Wind tunnel at the Transdisciplinarity Research Centre, Zurich University of the Arts. (Photo: Reinhard Wendler)

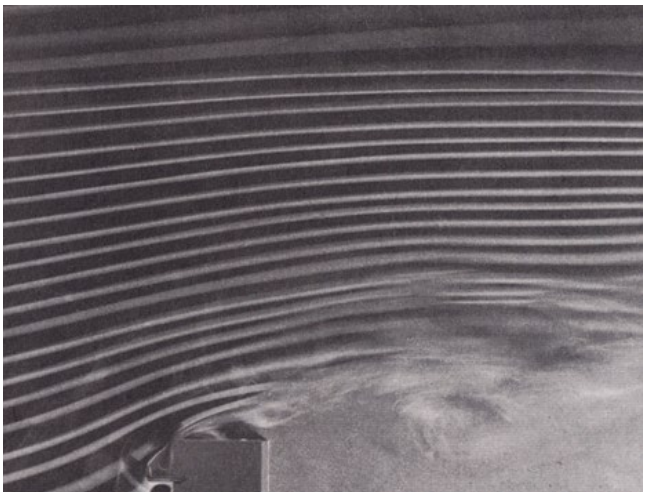


Fig. 5: Smoke test of an architectural model, from: Rolf Janke, Architekturmodelle, Stuttgart 1987, p. 93.

In the »Size Matters. Zur Maßstäblichkeit von Modellen« (Size Matters. On the Proportionality of Models) project at Zurich University of the Arts Florian Dombois and I opted for the wind tunnel as the place for this kind of substantiation. We are currently working on our own wind tunnel, which can be seen here (Fig. 4) in an incomplete but already working version. In late autumn it should be circular in shape, corresponding to the so-called Göttingen type. Its design will then be similar to the wind tunnels with which we are cooperating: the ETH Zurich wind tunnel in Dübendorf, the Wright Brothers Wind Tunnel at the MIT and the Low Speed Wind Tunnel at the Von Karman Institute for Fluid Dynamics in Rhode-Saint-Genèse, Belgium. In the wind tunnel, as mentioned earlier, the size of the model has an effect on the wind so that connections between the waywardness of models and that of scaling can be observed in a specific context. In this investigative situation, however, a further factor comes into play that has its own dimension of incomprehensibility: the wind. The wind appears in the Odyssey as a power over which man has no control. In Book 10, for example, Aiolos, the God of the Winds, gives Odysseus a leather bag in which he had enclosed all of the winds but one. The remaining wind is intended to take Odysseus straight back home. But the mistrust of his companions makes them open the bag and release all of the winds, which then take the ship straigth back to Aiolos. The god is forced to realise that a man can never control the winds and will thus always be their plaything. Comparable poetic adaptations of the wind as something alien, different and volatile are to be found by the thousand to this day, and the wind even maintains this status against the presumptions of wind tunnels and computer simulations.

The engineering wind tunnel in which attempts have been made for a little over 110 years to confront these three aliens – the model, the scaling and the wind – plays a role similar to that of Aiolos's leather bag. It excludes all of the winds except one and is thereby intended to make this one describable. But this wind is divided into several different winds by a so-called blunt body like the scale model of a building and thereby again evades description (Fig. 5). The scale and shape of the model are to blame for different kinds of such divisions so that at a precise point on the surface of a material object the three intangibilities of the model, the scaling and the wind are interlocked. The wind tunnel is burst open from within, as it were, by the cornucopia-like surplus of this compression. In this way it becomes clear ex negativo that the engineer's understanding of the wind tunnel is also a pragmatic abstraction, ae programmatic minimisation behind which the object has been made to disappear in all its other dimensions and must first be retrieved again.

That is why our wind tunnel helps not only with studies on the commonalties and differences between physical and aesthetic scaling effects in the wind tunnel but also to measure the wind tunnel's cultural size as a place and an object. With reference to John Law one could say that we are trying to sound out its »fractal coherence« (10). In Law's words the wind tunnel is more than one object and less than many. The specific character of the wind tunnel's fractal coherence is determined inter alia by the disciplinary perspectives that are compressed in it. As a rule it is a meeting place for vehicle and armament engineers, architects, town planners and sports scientists. At our wind tunnel practitioners from art, the theatre, sound and

media, sculpture, art and science history, cultural science, etc. come to make use of it from their perspectives and with their practices ande objects, thereby increasing the number of its facets. Hitherto it has shown itself to be, inter alia, a metaphor machine, a designer, a technical object, an art object, an art space and a musical instrument, an experimental system, a foehn, a pubescent juvenile, a physical iteration, a second order model, a boundary object, a playground, an object in Derrida's time mode of the avenir and sand in the works at the Zurich University of the Arts.

The wind tunnel supports this compression of perspectives by virtue of its physical presence in unfolding a perceptible gravitation. It has what Aby Warburg called a »spirit-assembling force« (11) and thereby puts into practice a model of transdisciplinary cooperation. It focuses the thoughts and deeds of its visitors in a specific way on the transdisciplinary objects model and scaling. In this combination of boundless phenomenal areas and a specific material object in the back yard of Hafnerstrasse 41 in Zurich it is thus available as a meeting place of the disciplines. It is both general and sufficiently specific to make a substantial exchange possible. One of the many possible subjects for discussion here would be the hypothesis that the power of reduction prevails not just in scale models but in every object of insisting reference. In the end, every object under observation becomes bigger and bigger on closer scrutiny. It unlimits itself, as it were, as we look at it and it would be interesting to share experiences of this »unlimitation« that have been gained in different disciplines.

Reinhard Wendler
Associated Member

Sources:

(1) Reinhard Wendler, Das Modell zwischen Kunst und Wissenschaft, Munich 2013.

(2) Gaston Bachelard, Poetik des Raumes, translated from the French by K. Leonhard, Munich 2007, p. 157.

(3) Paul Valéry, Werke. Frankfurt edition in 7 volumes, edited by Jürgen Schmidt-Radefeldt, Frankfurt am Main 1990, Vol. 2, p. 75.

(4) Alton J. DeLong, Phenomenological Space-Time: Toward an Experiential Relativity, in: Science, Vol. 213, No. 4508, 1981, pp. 681-683.

(5) Sarine Waltenspül, Der Reiz der Uneindeutigkeit. Modelle im Film zwischen Technik, Ästhetik und Illusion, master's thesis, Zurich 2013, p. 33.

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Phylogenetic Analysis of Art, 22.10.2013

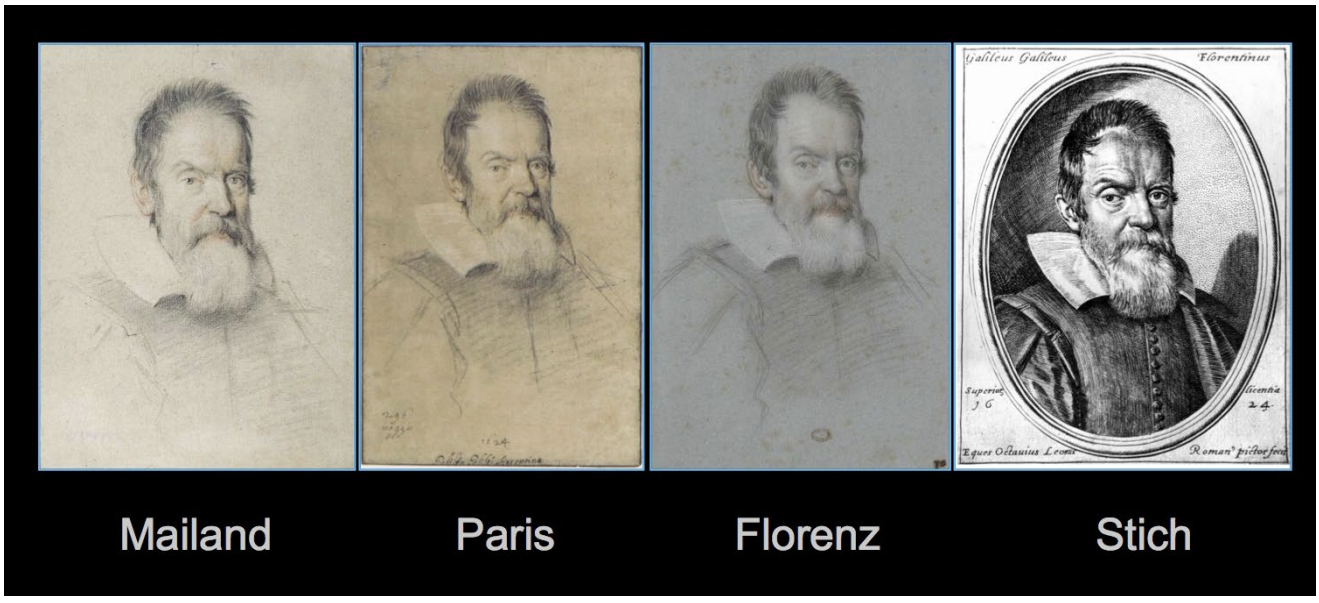

Fig. 1. Ottavio Leoni's portraits of Galileo Galilei: The three drawings (from left to right: Milan, Paris, Florence) and the etching. This, according to Bredekamp, is the order in which they were done (Bredekamp 2011).

In 1624 the Roman artist Ottavio Leoni, 1578–1630, drew what is surely the best-known portrait of Galileo Galilei (Fig. 1). Closely connected with this etching (in the Biblioteca Apostolica Vaticana) are three more drawings now held in Milan (privately owned), Paris (the Louvre) and Florence (the Biblioteca Marcelliana) (Fig. 1). What the etching and the drawings have in common is their perspective of Galilei and roughly the same detail. The techniques used in the drawings differ, however. They do so in the colour or the choice of paper. In addition, clear differences in many details of the depictions can be recognised, but also agreements that permit a grouping of the portraits.

In a 2011 essay Horst Bredekamp undertook an intensive comparative analysis of these pictures with a view to reconstructing the order in which they were done. Based on his extensive experience as an art historian he used the Morelli method, which assumes that the artist's »true nature« is revealed in small and incidental details that are added to the main subjects of the work of art more or less unconsciously and uncontrolledly (cf. Ginzburg 2011).

In his reconstruction Bredekamp accordingly undertook, along with an assessment of the overall impression, a comparison of structures such as eyebrows, side curls or tufts of hair. Including historical background knowledge he concludes from this approach that the order in which the portraits were made is likeliest to have been Milan, Paris, Florence and, finally, the etching (Fig. 1). He feels that Leoni must have based his etching on the drawing that is now kept in Florence (Bredekamp 2011).

A question of this kind and the approach that Bredekamp takes to solving it show some similarities with the approach taken in biological systematics and phylogenetics. There has, however, been a radical change in biological systematics since the 1950s. The entomologist Willi Hennig first developed a method that did justice to Darwin's call, nearly 100 years previously, for organisms to be classified on the basis of their genealogical relationships (Hennig 1950). With his phylogenetic systematics in which characteristics are evaluated for the first time with regard to their relative evolutionary originality (plesiomorphs) or novelty (apomorphs), biology now had at its disposal not only a method by which to reconstruct genealogical relationships but also a need to provide characteristics in support of every phylogenetic relationship hypothesis that is put forward. That led to a considerable improvement in transparency and reproducibility. Previously (and frequently thereafter) it was customary for scientific authorities to put forward on the basis of their experience hypotheses about relationships between organisms that

were for the most part unfounded and were in methodical terms not clearly comprehensible. Konrad Lorenz (1941) even referred to a »systematic feeling of tact« that could be learnt and that supposedly characterised experts. In the final analysis, however, the question is what kind of experience of »feeling of tact« can be involved in the reconstruction of divisions of species that took place more than 500 million years ago, laying the groundwork for today's biodiversity. What kind of experience enables us to be sure that a cockchafer is more closely related to an earthworm than to a parasitic roundworm?

About 20 years after the publication of his book Hennig's methodical principles were radicalised by a group of young American scientists, most of whom worked at the American Museum of Natural History in New York (Hull 1988). Claiming to establish systematics as an exact science, they formulated a number of principles based on Hennig's method. They include the minimisation of underlying assumptions, freedom from prejudice, an emphasis on analytical aspects, objectivity, reproducibility, falsifiability, the principle of rigour (Ockham's razor) and a critical attitude toward statements by scientific authorities. At the same time and in connection with the above principles computer programs were developed for phylogenetic analysis. This method presupposes the above-mentioned principles, especially the most unprejudiced treatment possible of the characteristics and no a priori weighting of them as important or unimportant. The result of the analysis was to show which characteristics especially bore out a hypothesis by means of similar and reciprocal support.

The question that now arose was to what extent this radical approach taken from biological systematics was transferable to art history and whether analytical computer programs could be meaningfully used to solve art history problems. Can the prevailing approach in art history, that of expertise and a synthetic view, be supplemented or even replaced by a more analytical approach with preconditions reduced to a minimum? Comparative analysis of morphological structures and their historical and genealogical interpretation were to represent two strictly separate methodical steps (Scholtz 2013). Could this biological view be transferred to observations on art history?

Bredekamp, for example, implicitly assumes a linear improvement or development of the works as the artist deals with the subject and the object portrayed, which may not even be in the series of portraits. Artists can be in poor form and series for which the sequence

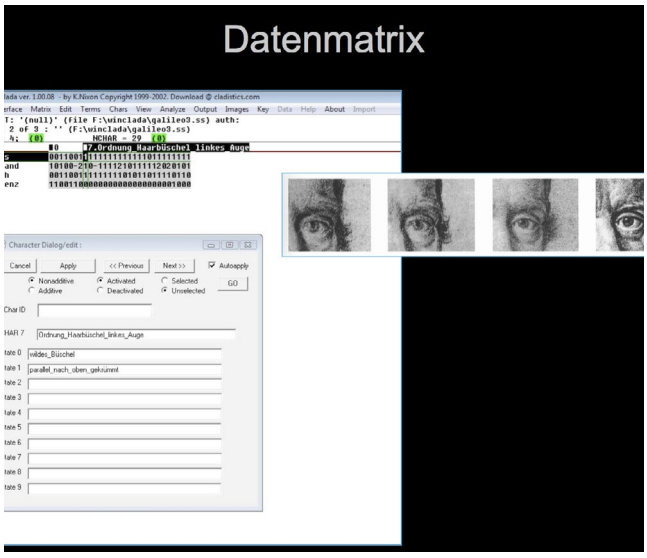

Fig. 2

has been established need not be characterised by a linear upward development. Even Morelli's approach, plausible though it may sound, is based on the ultimately unproven basic assumption that an artist really is *entirely himself* in minor details. The attempt to transfer phylogenetic methodology to works of art was undertaken with reference to Leoni's series of Galilei portraits. It was prompted by a lecture that Horst Bredekamp gave on the subject at the »Sichtbare Form« conference in September 2010. On the occasion of this presentation Fabian Scholtz noticed a number of contradictions in the distribution of structural similarities between Leonis portraits that might run counter to Bredekamp's interpretation.

Fabian and Gerhard Scholtz thereupon got together, identified these characteristics, listed them and prepared them for computer-assisted analysis. In all, 27 structures were selected for computer-assisted analysis. In the process both the examples used by Bredekamp (2011) and many new characteristics were compared and coded for preparing a data matrix. Characteristics are broken down into different character states. The characteristic »forelocks« was, for example, subdivided into *straight* or *curved* (see Fig. 2). This level-headed approach underscores yet again the great contrast with the approach of Bredekamp, who for instance has this to say in his comparison of the eyebrows: »As in a film a metamorphosis takes place in a tiny space that connects the different versions one after another. According to this sequential logic the Milan drawing is a tentative version, the Paris drawing is a corrected version and the Floren drawing is the final version« (Bredekamp 2011, 24).

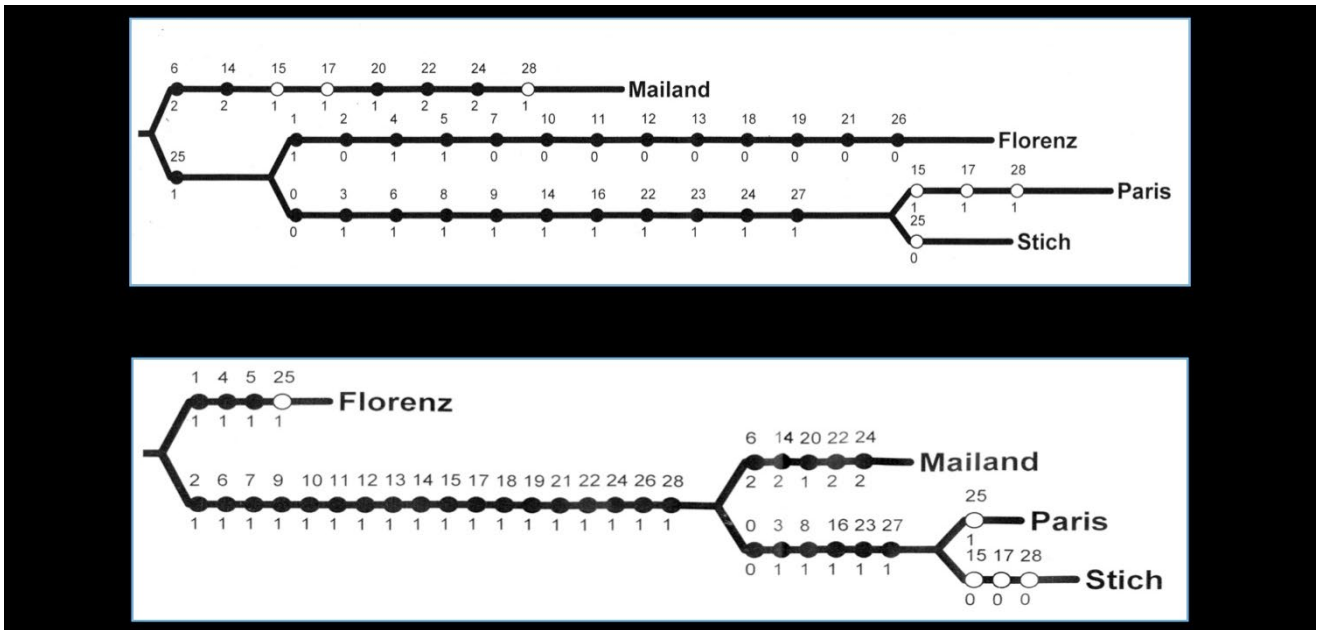

Fig. 3. The result of the computer-assisted analysis of the relationship between the different portraits: This is the most economical overall solution for the change steps between the character states of all characteristics used. Above: the roots of the Milan portrait; below: the roots of the Florence drawing. The different roots do not affect the close relationship between the drawing from the Louvre and the etching. The dots indicate characteristics that support the respective branches. There is a strikingly large difference between many characteristics of the Florence drawing and the other three portraits. In the upper relationship diagram these differences are designated as specific character states of the Florence drawing. In the lower diagram they are shown as unifying character states of the three other portraits. White dots signify character states that support individual branches and do so independently for several branches. Black dots symbolise character states that support individual branches without contradiction.

The analysis revealed only a very sparing topology or arrangement of the portraits with the least possible number of change steps between character states. The roots of the phylogenetic tree first took shape in the Milan drawing because, according to Bredekamp (2011), it was probably done first (Fig. 3). In addition, roots were drawn for the drawing from Florence because it in many respects differs from the other three portraits (Fig. 3). In any case the Paris portrait and the etching proved to be most closely related. In no instance does the Florentine drawing that Bredekamp (2011) favours form a group with the etching. How, then, are these results to be interpreted?

The analysis first shows the existence of many structural similarities between the Paris drawing and the etching. It can furthermore be postulated that these similarities are the expression of a serial development when compared with the other two portraits. It is thus no longer plausible to see in the Florence portrait, which is so different in many details, a direct model for the etching. Why should Leoni use one drawing as his model and then take many fine structures in the etching from an older version? What use is a model if the artist's shape memory preferred another variant in working on the etching? The use of the two drawings simultaneously would also seem unlikely because the Florence drawing has very few similarities with the etching and, indeed, even fewer than the Milan portrait.

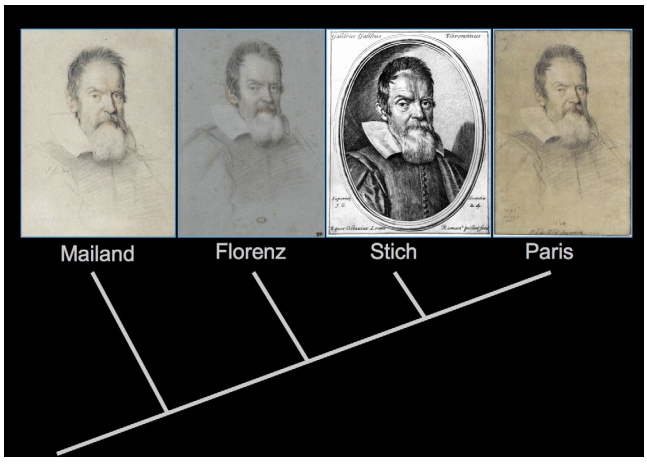

Fig. 4. The analytical method permits only the statement that the Paris portrait and the etching are the »most closely related« but fails to indicate any chronological order. The respective fork points can be turned in either direction. So the drawing from the Louvre could have been done after the etching (photos from Bredekamp 2011).

This method cannot solve the question of whether the Paris drawing was done before or after the etching. It could of course have been done after completion of the etching and based on it (Fig. 4). Why in that case does the Milan portrait have more similarities with the etching than the Florence drawing? Could the Florentine drawing be the first draft or the portrait for which Galilei sat?

Applying biological and phylogenetic methods of analysis to art history does not, of course, solve all the problems but it does reveal clear alternatives to the established methodology of comparative image analysis and also raises a number of interesting issues. This method is naturally not without preconditions. Critical scrutiny could, for example, be devoted to whether the fundamental assumption of a closer relationship can be accurate at all on the basis of structural similarities.

Gerhard Scholtz
Principal investigator

Fabian Scholz
University of the Arts

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Indexing Collections, 26.11.2013

Fig. 1: »Portrait of a Gentleman«, artist unknown, in reflected and backlight, Kunstbibliothek, Staatliche Museen zu Berlin. (Photos: Sabine de Günther | BWG 2013)

Fig. 2: Interdisciplinary model: Equal and simultaneous participation of disciplines.

The Collection

The »Indexing Collections« base project is conducting exemplary research into a previously unexplored collection area of the Lipperheidesche Kostümbibliothek held by the Kunstbibliothek of the Staatliche Museen zu Berlin. The collection was assembled by Franz von Lipperheide and is a mixed bag of paintings, sculpture, print material, prints and photographs that claims to be a collection of fashion and costume source material. Franz von Lipperheide donated most of his collection, acquired between 1877 and his death in 1899, to the Prussian state subject to the proviso that it made his collection of costume history accessible to the public. The collection area to be opened up by the base project consists of paintings small and large, miniatures and sculpture varying in quality and style. The items range from Christian and genre via satirical scenes to portraits that make up around 90% of the collection. They date from around 1500 to 1905. All were put into storage during World War II, and after the war the collection was divided, with a part held in West Berlin and a part held in East Berlin. They were only reunited in the new building of the Kulturforum from 1993 onward. In keeping with their varied history, the items are in different states of preservation and some are greatly in need of conservation and restoration (Fig. 1). The paintings use a wide range of materials. Alongside this portrait on mother of pearl that in backlight resembles amber the large-format paintings are mainly classical oil paintings on canvas and wood. Among the miniatures, in contrast, a much wider range of materials is used. They range from oil on cardboard, copper, iron or silver via watercolours on ivory to reverse glass painting, lacquer work and enamel painting on ceramics. The sculpture is for the most part made of wax with several works incorporating textile, gemstone, hair and animals' teeth applications.

Indexing

The »Indexing Collections« base project is an experiment with a model of interdisciplinary opening up that for one means all disciplines approaching the object to be observed simultaneously. For another, it suggests that all of the disciplines represented should select on an equal footing objects that are to be worked on jointly and may then be placed on exhibit. The following questions recur regularly and are discussed time and again in the base project: How do we approach this model and how do we shape it? What exactly does interdisciplinarity mean in our base project? Clearly, interdisciplinarity begins where the individual discipline can make no further progress with its question. But does every discipline have the same need for interdisciplinarity? Does interdisciplinarity begin from the outset? Does it begin in the organisation of

Fig. 3: Attempt to set up intersections among the paintings chosen by the various disciplines. (Photo: Francesa Kaes | BWG 2013)

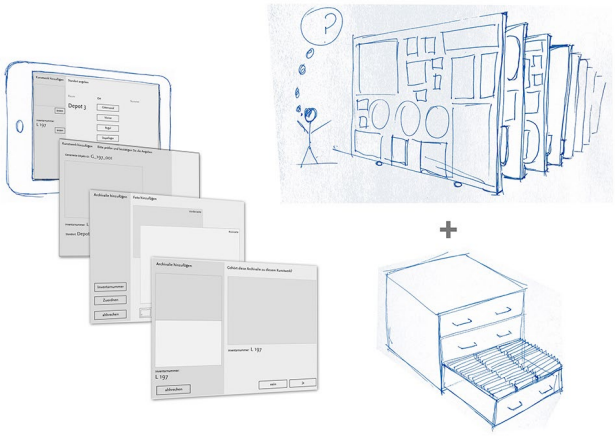

Fig. 4: Sketch of a digital tool for taking stock of the collection. (Collage: Rebekka Lauer | BWG 2013)

indexing, in the way that disciplines collaborate? Does interdisciplinarity change one's way of working and one's methodology? Are indeed the borderlines between disciplines blurred? (Fig. 2)

The stage of basic registration of the collection, i.e. viewing and arranging the paintings, is characterised by largely disciplinary, parallel work in which each discipline approaches the collection in its specific way using its own methods. The first deliberately planned interdisciplinary currently under way is a selection of objects on which researchis to be undertaken by means of a joint, interdisciplinary approach. Each discipline has both drawn up a catalogue of criteria that reflect its own interest in learning more about a selection of paintings and made a specific choice of paintings. To accompany this selection process the team has invited the »Experiment & Observation« base project to gain insights into and make suggestions for the design of the interdisciplinary indexing of the collection by means of external observation and reflection on the process (Fig. 3).

Highlights of Disciplinary Work

In detailed research the **Interaction Design** representative observes the participating disciplines' working methods in order to find out which parameters, conditions and, indeed, opportunities for integrating new digital tools into the interdisciplinary indexing process are needed and what shape they must take. Starting with the research and findings of the viewing and arrangement of the collection, a first draft for a tool was developed that makes it easier to merge and match a stock of objects housed in a depot in the maximum chaos of Petersburg hanging with index cards that are stored somewhere else using a different system (Fig. 4).

Clothing and Fashion History looks at clothing for differences between classes and sexes, for the occasion (full-scale, mid-scale, negligé), for the geographical and temporal context and for the distinction between clothing designed for city, court or rural life. The cut, the material and the decoration of materials are investigated, as are garment decoration, hairstyles and the adoption of foreign elements such as the Spanish ruff and variations on it. Special attention is paid to elements with insignia character (Fig. 5).

Art History approaches the mixed bag that is to be opened up by viewing and arranging the entire inventory. An exemplary question with regard to the Lipperheide collection is assigning the physical objects to the entries in the travel expenditure records and thereby learning more about the provenance of the object and the time of its purchase. Initial estimates of the quality of the collection and individual objects, initial assignments and identifications of the people and scenes portrayed and the search for models and initial datings already take place during the viewing and basic recording. Reconstruction of the original mixed bag, i.e. attempts to clarify sales and losses and the matter of Franz von Lipperheide's main focus of collecting are also art history topics.

Fig. 5: Princess Anne of Denmark, 1574–1619 (artist unknown, Kunstbibliothek, Staatliche Museen zu Berlin), married King James VI of Scotland, later James I of England, Scotland and Ireland. S and C4 are the royal insignia. At her husband's request Anne adopted the style of clothing of her predecessor Queen Elizabeth I.

Fig. 6: »Four Events from the Legend of St James the Elder«, Konrad of Freisach, Kunstbibliothek, Staatliche Museen zu Berlin. Photos taken by the multispectral camera in the infrared range revealed a feature that was painted over. The saint's fingers were initially fully exposed but later partly overpainted by work on the sleeve. Enlargements: visual light (left), infrared light (right). Below them is the multispectral camera »Artist«.

The main focus of **conservationists** involved in the project is on art technology investigation using different optical imaging procedures. Microscopic images should deliver findings on the structure of paint layers and information about changes and aging processes. Photographs in the infrared and ultraviolet spectral range and the X-ray range serve to make changes (pentimenti, retouching, condition) visible. Other processes (spectral photometry, infrared spectroscopy) can be used to identify colour values, binding agents and pigments (Fig. 6).

For the **restorer** viewing objects in the collection begins with and at the object. The painting and frame are measured, the materials are identified and indications of the collection and restoration history are noted.

A special concern is not only to determine the condition of the object and record any damage but also to arrange the objects by damage categories to compile a priority catalogue for their conservation and restoration. If the project leads to an exhibition the restorer will also have to prepare the works of art for the exhibition. When the paintings were put into storage during World War II some of them were damaged in storage, presumably by coming into contact with dirty water. Strong, inhomogeneous pollution of the paintings' surface and maybe even mould formation were the result. After the war the paintings were cleaned. Why they were only half cleaned has yet to be clarified.

Computer science has set itself the task of modelling and (prototype) implementation of workflows and documents, taking into account interdisciplinary requirements, existing standards and applicability to comparable cases. The basic recording stage is characterised by setting up the digital infrastructure. Along with the search for suitable collection databases this includes metadata modelling standards and open access strategies on a national and an international scale (Europeana, DDB). In view of the unsatisfactory range of suitable collection databases available the provision of digital infrastructure led temporarily to in-house development of a work platform adjusted to the project's needs.

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The *Interdisciplinary Controversy* in the *Interdisciplinary Laboratory*

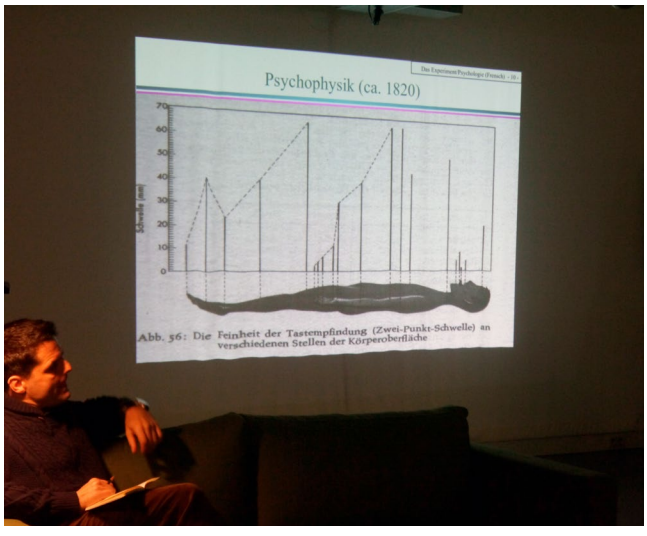
The *Interdisciplinary Controversy* takes place at regular intervals up to twice a month (Photo: Claudia Lamas Cornejo | BWG 2013)

The *Interdisciplinary Controversy* is a discussion format of the *Interdisciplinary Laboratory* in which individual concepts or models are discussed, always from the perspectives of two different disciplines. It is less a matter of a precise definition of a concept than one of working out overlaps and intersections between individual disciplines in respect of a concept or a method.
Participation in an *Interdisciplinary Controversy* is by request only. Please e-mail bwg.publicrelations@hu-berlin.de.

Claudia Lamas Cornejo
Head of Public Rublic & Fundraising

On the Subject of »Experiment«, 21.11.2013

On Thursday, 21. November 2013, an *Interdisciplinary Controversy* took place on the subject of »Experiment«. The invited »adversaries« were Helmar Schramm, Professor of Theatre Studies, and Peter Frensch, Professor of General Psychology. Biologist Thomas Stach was the moderator.



While Peter Frensch discussed the subject by means of a »classical« psychological experiment, his adversary Helmar Schramm referred to examples from the 55th Art Biennale in Venice.

Fotos: Claudia Lamas Cornejo 2013

On the Subject of »Code«, 12.12.2013

On Thursday, 12. December 2013 the *Interdisciplinary Controversy* was held in the central laboratory with Peter Deuflhard of the Freie University of Berlin and Sigrid Weigel of the Centre for Literary and Cultural Research Berlin discussing the subject of »Code«.

The literature and cultural studies specialist Sigrid Weigel discussed »code« in terms of two examples: the genesis of »genetic code« and the »facial action coding system«. The mathematician Peter Deuflhard explained »code« as an instrument of encryption (coding) and decryption (decoding).

Fotos: Claudia Lamas Cornejo | BWG 2013

Review of Events

»Von Innen nach Aussen« Exhibition , 11.11.2013 – 05.05.2014

Around 200 guests, including many diplomats from Germany and abroad, attended the opening of the »Von Innen nach Außen« exhibition at the Stiftung Neue Synagoge Berlin – Centrum Judaicum.

Horst Bredekamp and Deborah Zehnder in conversation with the exhibition's curator Christian Dirks.

Reports were shown in the original language and in German and English translations.

The *Interdisciplinary Laboratory* developed and designed as a cooperation contribution a freestanding exhibition system for the exhibition »Von Innen nach Aussen. Die Novemberpogrome 1938 in Diplomatenberichten aus Deutschland. 75 Jahre nach den Pogromen« held by the *Stiftung Neue Synagoge Berlin – Centrum Judaicum*, which was opened to great public interest on 11.11.2013 Interesse. Julia Blumenthal, scientific staff member and director of the model workshop at the Cluster of Excellence *Image Knowledge Gestaltung*, designed a plug-in system consisting of variable elements. »My aim,« she said, »was to create clear rooms that you had to negotiate and in which you might be involved in hits and collisions here and there.« That was why her design included stumbling blocks, i.e. elements that visitors had to cross. »I wanted them to have difficulty in moving around in much the same way as the pogrom nights with the mountains of rubble they left behind.«

»Speaking Images« Exhibition, 04.12.2013 – 05.02.2014

On the Use of Images in the Interdisciplinary Laboratory *Image Knowledge Gestaltung*

Numerous guests, members and supporters of the *Interdisciplinary Laboratory* attended the opening of the ethnographic exhibition »Speaking Images – Speaking of Images« on 04. December 2013 in the foyer of the Jacob und Wilhelm-Grimm-Zentrum.

Following the words of greeting by Horst Bredekamp, Andreas Degkwitz and Michael Seadle, the curator Thorsten Beck explained the concept behind the exhibition project and how it originated.

The exhibition attracted many visitors to the Jacob-und-Wilhelm-Grimm-Zentrum

Fotos: Franziska Wegener | BWG 2013

Interview with Thorsten Beck on the »Speaking Images« Exhibition

Thorsten Beck talking about the ethnographic investigation of the use of images at the Cluster of Excellence *Image Knowledge Gestaltung*. (Photo: Frauke Stuhl | BWG 2013)

I met Thorsten Beck on a Tuesday morning in the central laboratory of the Cluster of Excellence Image Knowledge Gestaltung in Sophienstrasse in Berlin-Mitte. It is still early and quiet in the lab, with staff arriving by and by. Thorsten Beck is the curator of the exhibition »Speaking Images – Speaking of Images« that deals with the scientific use of images.

What, for you, is an image?

I come face to face with images everywhere. For me, images are visual surfaces that captivate me. If you like, we constantly meet inside images even though we think we can look at them in isolation. Images are challenging. As artistically designed surfaces images have their limitations, however; they create intervals, you stumble involuntarily from image to image. In the street, for example, when you stand in front of advertising posters. But even a garden dwarf can be an image, as can a park that is deliberately laid out or a boutique.

How did you come to the Cluster of Excellence?

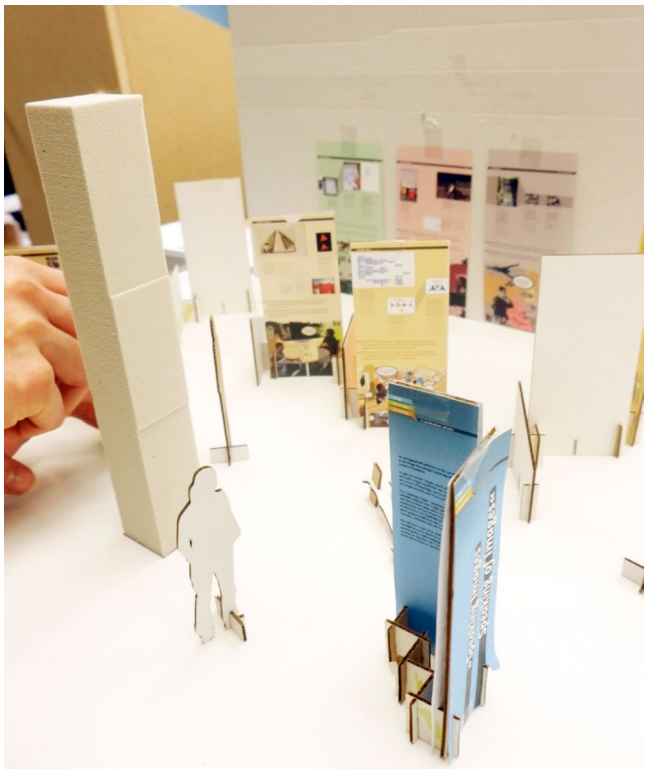
Via the images of the Cluster. I stumbled over the website and the way images were handled there triggered my interest. I find the abundance of projects that approach the image from different directions fascinating and pleasing.

Where do you come from careerwise?

From different directions (laughs). I studied Jewish studies, literary studies and politics. Then I worked for the Jewish Museum in Berlin for several years, doing exhibitions and special projects there. In the process I naturally had to do with images and art and was fascinated by the question of how scenography influences our perception of objects. Images and objects seldom really stand for themselves. They are placed somewhere, illuminated, staged, That is then also an interpretation, and that is why interests me in my PhD work.

What does the »Shaping Knowledge« base project investigate and what exactly do you do in it?

In »Shaping Knowledge« we ask which knowledge images convey and how this knowledge is actually understood. »Shaping Knowledge« deals with the conditions by means of which knowledge is generated and maintained. You can look at it from a historical perspective or you can classify knowledge and formalise the order of knowledge. I personally am interested in the different disciplinary cultures. Is there such a thing as a disciplinary self-understanding in dealing with images? Where are there similarities and differences? That would be a question we can approach by means of the instrument of the exhibition.



The exhibition is a joint project of the Interdisciplinary Laboratory *Image Knowledge Gestaltung* and was designed in its Model Workshop. (Photos: Claudia Lamas Cornejo | BWG 2013)

How did the idea for the exhibition originate?

I discussed it with Michael Seadle, the exhibition's project manager, and he encouraged me to use the instrument of the exhibition as a scientific method for once. We were keen to share our ethnographic observations with colleagues in the Cluster of Excellence and an exhibition seemed to be a useful means of doing so. The exhibition is there, physically, in the room. You can feel attracted or repelled, you can compare and discuss it. Scientists do not always know exactly what their colleagues are doing. Besides, an exhibition can be a good mirror of our work, a kind of shop window.

How did you choose the people you interviewed?

We wanted to present a wide range of disciplines and were especially interested in the designers because they play a unique part in the Cluster. Where else do biologists, architects, theatre scholars and designers sit together around a table and discuss the same problems from different perspectives? But a choice is also always subjective, coincidental and the result of many circumstances – such as the banal circumstance that so and so many people work here. We later decided, in addition to the scientific staff, to take the Cluster's two directors, Horst Bredekamp and Wolfgang Schäffner, on board. They provide key stimuli and that is why they should be exhibited. It makes many things clearer.

What was a fundamental finding of your interviews?

Maybe the matter-of-course way in which the different disciplines make use of the image medium without stopping to think much about it. For designers that is obvious, of course, but in the other discipline it came as a surprise to me that there was a relatively clear idea of which aspects of the image are interesting or worth researching but that the question of definition was not necessarily raised. There is an intuitive naturalness where images are concerned.

What part does the image play in your research work?

In my specific work I use the image as a medium for experimentation. Classical ethnology would adopt a text-based approach and write up or transcribe what is observed. We incorporate visualisations into our work in order to take our ethnographic settings further by means of imagery. What I am also after is the power of the unscious that

pervades each image. What interests me for my PhD thesis is how museums convey knowledge by means of images, what kinds of knowledge they entrust to which kinds of image and the extent to which it is actuall understood. That is seldom given much thought in museums and that I why I find it interesting.

Which disciplines use which imagery?

Off the cuff I recall the interview with the biologist Carola Becker in which there was a very fine moment. I was surprised by how very colourful she makes her images – by deliberately colouring her preparations, for instance. It was fascinating to see how she does it and also illuminating that clear limits are set to image editing of research results in biology. A much freer use of it is made in other disciplines, of course. Overall, dialects, if not languages, can be identified. Some use their images in an entirely narrative fashion as scientific evidence, while for others the image is the method or they use images to present and to convince. There is a whole range. Distinguishing between individual and disciplinary usage should be an interesting challenge.

What are your wishes for the exhibition?

I would naturally like us to have interested visitors! (laughs) The exhibition is an experiment and opens up a space for discussion. And by all means let it be controversial. It is an instrument and the continuation of our ethnographic observations, but this time against the backdrop of where disciplines stand on images. The outcome is entirely open and we are definitely looking forward to it.

Does the location, the foyer of the Grimm Centre, play a part?

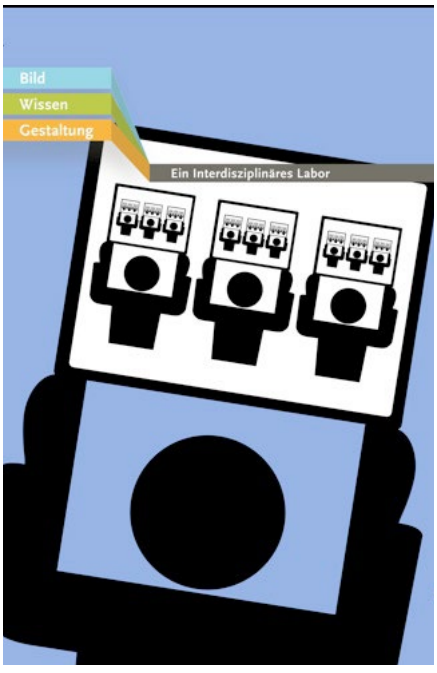
Yes, the location is wonderful, of course. What a splendid idea to locate the exhibition in the immediate vicinity of the university's treasure trove of knowledge! Image and word so close together, that is a very good subject match. We also have a target public there for which our exhibition may be exciting. As a rule, visitors have to come to an exhibition. This time we are taking the exhibition to a location with a public of its own. The exhibition will end up itself being an image in its location. I can well imagine that image for this location. We have here an opportunity to provide a vibrant stage for the images of science.

Thank you very much for the interview!

The interviewer was:

Claudia Lamas Cornejo
Head of Public Relations & Fundraising

Workshop Report *Otto Neurath: Words Divide – Images Connect*

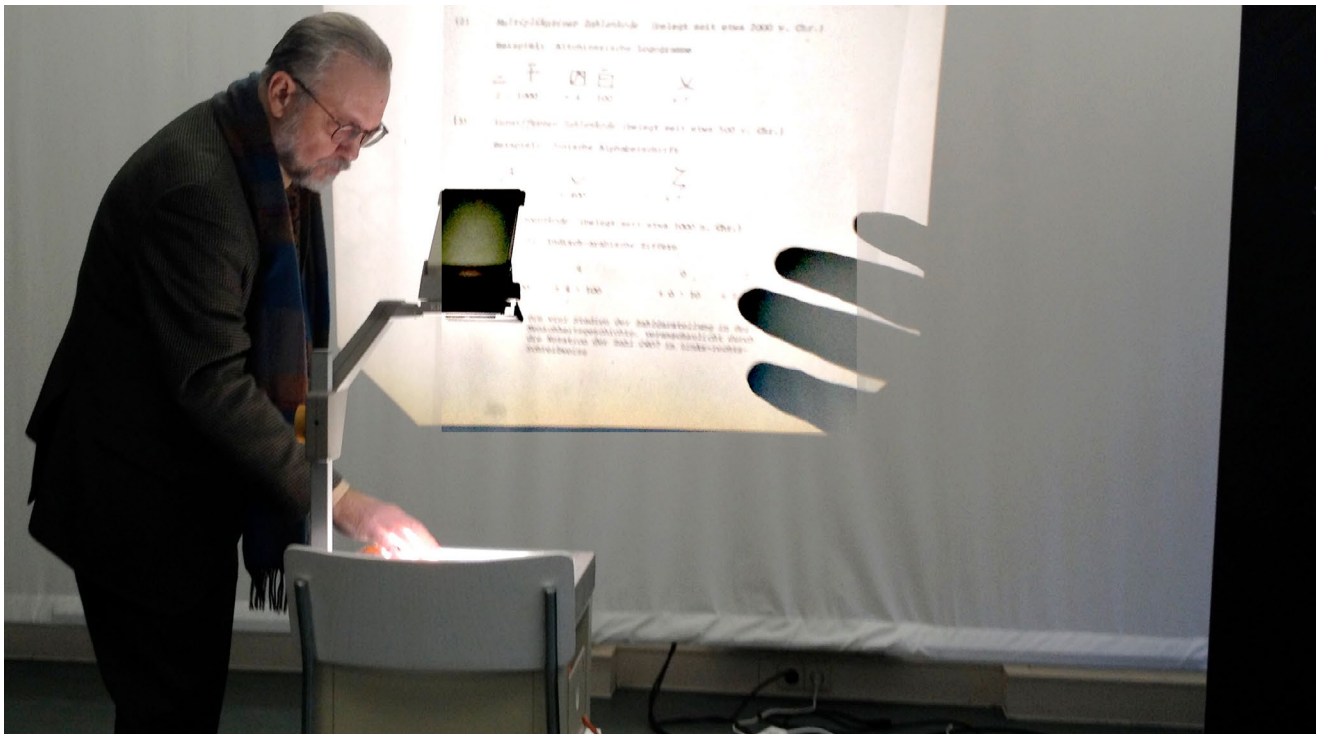



From left to right: Poster for the workshop, held on 22/23. November 2013; pictograms of strikers and unemployed: Otto Neurath in 1945.

Otto Neurath's work as a philosopher, economist and popular educator led to the concept of the isotype, an acronym for *International System of Typographic Picture Education*, which has had an enduring effect. It is, admittedly, less the revolutionary basic idea of using a universal imagery with typographic picture elements for educational purposes than above all the graphical elements originally designed by Marie Reidemeister and Gerd Arntz that are to be found in airports and buildings all over the world and have established a lasting presence there.

The repertoire of the *Viennese method of image statistics*, as isotype was initially known, consisted of over than 4,000 signs. There were clear rules for the colour, shape and size of the individual signs, which did not just replace figures but were intended to perform a didactic function. They were the basic pictographic elements of images that were to reach members of »classes with unequal education«, »the educated, semi-educated and illiterate« and »the tired« (Neurath, 1944). Hundreds of controversial and impressive pictorial statistics were created for Viennese exhibitions, including the famous Economic Atlas. After Neurath emigrated to the United Kingdom in 1940 the socialist documentary film-maker Paul Rotha began to include Neurath pictorial statistics, including animations, in his his propaganda and educational films to explain economic issues, for example. The off-screen »isotype« figure plays the role of the educator. The idea of using pictorial pedagogy to convert, in particular, dry figures into educationally meaningful reduced arguments delights museums in the Netherlands, the UK, Russia and the United States that were set up along Viennese lines – and not only them.

Neurath's work is one of the theoretical starting points for *Cluster of Excellence's* »Pictograms« base project. In the Workshop we took up where the animated and still pictorial statistics of the Neurath, Reidemeister and Arntz trio left off and undertook a critical review of their educational claims in past and present. Most of Neurath's pictographic legacy seems to have been subsumed in advertising graphic design and directional pictograms. His theoretic positions, starting with his work as an economic statistician and in the »Vienna Circle« from which this design focus took shape, is largely ignored or not seen as being related to it. Glyphs prevail at the surface level and not in their educational imagery depth. So has the approach basically failed? Are images really universal and can they in argumentation replace the spoken and written word? These questions were discussed and answered controversially without arriving at a definitive answer. Different statements were made that underscored both the historic and present-day effect of his theoretical and practical work. We also saw signs of a task that will continue to preoccupy us.



Lecture by Prof. Roland Posner on 23. November 2013 in the *Interdisciplinary Laboratory*. (Photo: Andrea Knaut | BWG 2013)

The workshop's lectures, held on 22 and 23 November 2013 at the *Cluster of Excellence*, shed light on the subject from very different angles. In addition to those outlined by Wolfgang Coy and Rebekka Ladewig, Andrea Knaut dealt with the implementation of isotype graphics in films. Frank Hartmann, a media philosopher and media researcher of many years' standing, contrasted Neurath's work with the utopias of Paul Otlet and his encyclopaedic *Musée Internationale Mundaneum*. Thomas Macho presented the effect of Neurath's pictorial pedagogy on the work of his successful student Rudolph Modley, who worked extensively in the United States.

Finally, the semiotician Roland Posner embedded the logical and pictorial educational approaches in a larger semiotic and historical framework.

The event, which the Alcatel-Lucent Foundation for Communication Research was kind enough to support, was seen by those who attended it as an important stimulus to reflect from a contemporary viewpoint on the long submerged work of Otto Neurath on logic, economic statistics, pictorial pedagogy and, last but not least, science theory in the form of »Unified Science«.

Wolfgang Coy
Principal Investigator

Andrea Knaut
Base project »Pictograms«

Public Events February–May 2014

18.–21.03.2014 | DGM Conference on Bio-inspired Materials (in cooperation with the BWG) | Kongresshotel Potsdam | Am Luftschiffhafen 14471 Potsdam

The »Re-inventing Design in the Spirit of Biomaterials« panel (19.03.2014) of the Interdisciplinary Laboratory *Image Knowledge Gestaltung* and its »Historic Structures« base project are bringing together experts in materials science, design, architecture, biology, cultural studies and restoration. A focal point of the session will be the question of how current bio-inspired miaterials research is changing the Gestaltung disciplines of architecture and design. Scientific materials research, architectural design, research into cultural theory and implicit knowledge are seen as a connected network and are interrelated accordingly. There will be a specific focus on wood as a material. The proceedings will begin with short lectures by the designer Neri Oxman, MIT, the architect Achim Menges, ICD Stuttgart, and others. There will then be a platform debate with the materials scientist Christine Ortiz, MIT, the biologist Friederike Saxe, HU Berlin/ Cluster of Excellence *Image Knowledge Gestaltung*, the materials scientist Ingo Burgert, ETH Zurich, and the cultural studies specialist Wolfgang Schäffner, HU Berlin/ Cluster of Excellence *Image Knowledge Gestaltung*.

10.–12.04.2014 | »Image Operations« Conference (in cooperation with the BWG)

Some images have an immediate effect on the world and change it in far-reaching ways. As a part of media practice they create events and have a direct and specific effect on people and bodies. These image operations are especially striking in wars, terrorist attacks and in political campaigns waged by NGOs, but also in medicine. Leading international scientists will discuss the constitutive role of images and the ethical problems they present at the international Image Operations conference organised by the art historian Charlotte Klonk of the Humboldt-Universität zu Berlin and the media scientist Jens Eder of the University of Mannheim and held in cooperation with the ICI Berlin.

From 16.04.2014 on alternate Wednesdays from 6 to 8 pm | Cluster lecture series | Lecture Theatre 2.07 | DOR 26

In the lecture series on the key issue of »Structure – Tissue – Surface« the form and visibility of surfaces and structures are to be investigated in the context of their natural, textile, art and cultural history. The aim is to determine which opinions, insights and findings make a reciprocal contribution toward the natural sciences, cultural and art studies, the social sciences and the design disciplines taking a fresh look at structures and to find out which syntheses can be shaped and formulated.

10.05.2014 | 8 pm | Long Night of Science | Humboldt-Universität zu Berlin | Unter den Linden 6

The *Interdisciplinary Laboratory* is presenting itself in the Humboldt-Universität's main building in the hall of the Hermann von Helmholtz-Zentrum für Kulturtechnik.

12.–13.06.2014 | Signalstadt (Signal City) conference (in cooperation with the BWG)

12.–13.06.2014 | »Unter die Haut« (Under the Skin) conference (in cooperation with the BWG)

14.–18.07.2014 | Children's Summer University

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