

VISUAL STUDIES OF SCIENCE

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Eng. *Visual Studies of Science*; Fr. *Études visuelles des sciences*; Ger. Although German-speaking scholars have provided key contributions to this field and helped ensure its very existence, the definitory lines in this case have been drawn in terms of research projects rather than discipline *per se* (e.g. “*Das Technische Bild*” established in 2000 at the Hermann von Helmholtz-Zentrum für Kulturtechnik at the Humboldt University of Berlin; “*Eikones/Bildkritik. Macht und Bedeutung der Bilder*” founded by the Swiss National Science Foundation around G. Boehm’s chair at the University of Basel in 2005. See Bredekamp *et al.* 2015 for a first list of these projects).

THE CONTEMPORARY DEBATE

In a section of “*Isis: A Journal of the History of Science Society*” dedicated to *Science and Visual Culture* (2006), N. Wise, in his essay *Making Visible*, describes how a radical shift occurred in the mid-1980s. While previously scholars had generally disregarded the study of production and use of scientific images, this shift swept over the methods and focus of the human and social sciences (primarily art history, the history of science, the history of photography and cinema, and visual culture studies) and converged with a profound movement underway in the iconosphere. This movement, which went on to erupt at the beginning of the 1990s, progressively modified the status and role of images in general (through both the internet, the development of digital technologies and devices for producing, reproducing, manipulating, archiving, disseminating and sharing images, as well as fine-tuning new forms of visualization such as 3D) and, as a result, granted increasing attention to the study of visual cultures (see W.T.J. Mitchell and G. Boehm, who coined the phrases “pictorial turn” and “iconic turn”, respectively). On the basis of these broad premises, the task of identifying a common agenda in the *Visual Studies of Science* appears all but impossible, in view of not only the many disciplines it covers, and thus the variety of methodologies (including intra-disciplinary differences) involved, but also the wide range of image types (from sketches to published pictures), visual devices (understood as devices for both visualization and the production and reproduction of images) and the uses of images (e.g. teaching visual aids), as well as perceptual, cognitive

or social processes for receiving and communicating these to different audiences (from the scientific community to general/popular audiences). This complexity is augmented by the fact that scholars often analyse both production and reception/circulation through approaches calibrated to specific case studies investigating the practices and discourses of different actors (scientists, anthropologists, engineers and explorers, to name just a few), a method which results in even more variables to be considered.

Although any attempt at synthesis has been defined as a “hopeless task” (Pauwels 2006), this undertaking might appear more feasible if pursued through an exploration of the dual genesis of this body of studies. In fact, by examining the genesis of visual studies of science, on the one side we find cultural studies and visual culture studies, fields which influenced the development of this research in the Anglo-Saxon setting in particular, while on the other we find the art history originated *Bildwissenschaft* that has structured the field especially in the German context. It is in the Anglo-Saxon and German contexts that the visual studies of science became the most structured beginning in the early 2000s, thanks in part to the activity of dedicated university departments and research centers, as well as publications summarizing the main results achieved in the field (see Jones and Galison 1998; Pauwels 2006; Hentschel 2014; Bredekamp 2015) and journal special issues devoted entirely to the topic of visual science (see for example the above-mentioned section *Science and Visual Culture* in the journal “Isis” from a history of science point of view, and the 2004 issue of the journal “Science in Context”, edited by L.D. Henderson, from an art history point of view).

Although critics are fairly unanimous in recognizing these as key beginnings, we must also add that the previous years offered some pivotal works regarding visual representation in the sciences, largely authored by art or visual historians such as M. Baxandall, S. Alpers, and B. Stafford and J. Crary few years later. Their studies of images and visualization in science have helped shed light on overlaps in the fields of art and science in different historical periods, as they focus on the scientific knowledge of artists (e.g. optics or colour theories) or, conversely, the role of art in scientific practices (e.g. illustrations in atlases). Going back even further, it is worth citing several studies launched in the 1960s which employed a variety of methodological perspectives yet shared critical approach to the idea of representation and addressed scientific images, their production and circulation by focusing on their relations of difference or similarity with artistic images and their respective production and circulation (see the 1968 exhibition at the Institute of Contemporary Arts London, *Cybernetic Serendipity* by J. Reichardt).

These studies have also exerted an influence outside their disciplinary areas of origin, touching the history of science, particularly in Anglo-Saxon contexts. The grounds for this inquiry were laid by a movement inside the history of science that can be encapsulated under the label “constructivism” stemming from developments dating back to the 1970s (see Golinski 1998): treating scientific knowledge as a human creation and therefore part of human cultures, certain scholars (such as D. Bloor and B. Barnes on the one hand, and B. Latour, M. Lynch, S. Woolgar on the other) began to conduct a history of science framed as a history of scientific practices instead of ideas or theories (see Bigg 2012). The way cultural and material historical studies influenced the analysis of scientific images from the 1990s onward can also be understood as part of this shift.

ART AND AESTHETICS

For its part, the history of art, particularly in the German sphere, has incorporated scientific images into its body of objects (see H. Bredekamp), explicitly drawing on the iconological method and history of forms (A. Warburg, E Panofsky) as a method that can aid in understanding all images, including scientific ones, as an integral part of the cultural and social codes they act to mediate and are in turn mediated by, and therefore as historical, social and political facts. The aim of these authors is thus to analyse scientific iconography as an element of knowledge production (in conjunction with the methodologies of cultural and media studies, sociology, political science, anthropology and in particular the history of science and technology studies) without, however, overlooking its visual specificity (see Bredekamp and Werner 2003; Bredekamp *et al.* 2015). This approach in particular intersects with contemporary aesthetics research in fundamental ways: first, but not exclusively, in the status it grants images as agents producing knowledge, a status stemming from the more general idea of treating images not as correlated, inert objects but as agentive fields the meaning of which is inevitably created inter-subjectively. At the same time, perhaps through a more subterranean pathway, this approach intersects with aesthetics in that it likewise recognizes the role aesthetic judgment plays in determining the perceived epistemological validity of scientific images over history (e.g. see Schummer 2006; Carusi 2008).

BIBLIOGRAPHY

- S. Alpers, *The Art of Describing: Dutch Art in the Seventeenth Century*, London, Murray, 1983.
- M. Baxandall, *Painting and Experience in Fifteenth-century Italy*, Oxford, Clarendon Press, 1972.
- C. Bigg, *Les études visuelles des sciences: regards croisés sur les images scientifiques*, "Histoire de l'Art", 70 (2012): 95-101.
- G. Boehm, *Wie Bilder Sinn erzeugen. Die Macht des Zeichens*, Berlin, Berlin University Press, 2007.
- H. Bredekamp, G. Werner, *Bildwelten des Wissens. Kunsthistorisches Jahrbuch für Bildkritik. Bilder in Prozessen*, Berlin, De Gruyter, 2003.
- H. Bredekamp *et al.* (eds.), *The Technical Image*, Chicago, The University of Chicago Press, 2015.
- A. Carusi, *Scientific visualizations and aesthetic grounds for trust*, "Ethics and Information Technology", 10 (2008): 243-254.
- A. Carusi *et al.* (eds.), *Visualization in the Age of Computerization*, New York, Routledge, 2015.
- J. Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*, Cambridge, MIT Press, 1990.
- L. Daston, P. Galison, *Objectivity*, New York, Zone, 2007.
- B. Ford, *Images of Science: A History of Scientific Illustration*, London, British Library, 1992.
- J. Elkins, *The Domain of Images*, Ithaca, Cornell University Press, 1999.

- J. Golinski, *Making Natural Knowledge: Constructivism and the History of Science*, Chicago-London, The University of Chicago Press, 1998.
- I. Hacking, *Representing and Intervening*, Chicago, University of Chicago Press, 1983.
- L.D. Henderson, *The Fourth Dimension and Non-Euclidean Geometry in Modern Art*, Cambridge, MIT Press, 2013.
- K. Hentschel, *Visual Cultures in Science and Technology. A Comparative History*, Oxford, Oxford University Press, 2014.
- C. Jones, P. Galison (eds.), *Picturing Science, Producing Art*, New York, Routledge, 1998.
- M. Kemp, *Visualizations. The Nature Book of Art and Science*, Oxford, Oxford University Press, 2000.
- B. Latour, *Visualization and Cognition: Thinking with Eyes and Hands*, "Knowledge and Society", 6 (1986): 1-40.
- M. Lynch, S.Y. Edgerton Jr., *Aesthetics and Digital Image Processing: Representational Craft in Contemporary Astronomy*, in G. Fyfe, J. Law (eds.), *Picturing Power. Visual Depiction and Social Relations*, London-New York, Routledge, 1988: 184-220.
- M. Lynch, S. Woolgar (eds.), *Representation in Scientific Practice*, Cambridge, MIT Press, 1990.
- L. Pauwels, *Visual Cultures of Science: Rethinking Representational Practices in Knowledge Building and Science Communication*, Hanover, Dartmouth College Press, 2006.
- A. Pinotti, A. Somaini, *Cultura visuale: immagini guardi media dispositivi*, Torino, Einaudi, 2016.
- M. Seel, *Aesthetics of Appearing*, Stanford, Stanford University Press, 2005.
- J. Schummer, *Gestalt Switch in Molecular Image Perception: The Aesthetic Origin of Molecular Nanotechnology in Supramolecular Chemistry*, "Foundations of Chemistry", 8/1 (2006): 53-72.
- M.N. Wise, *Making Visible*, "Isis. A Journal of the History of Science Society", 97 (2006): 75-82.

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