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A Dialogue, That Isn't (Yet) One
How Philosophy of Science and Study of Art
Learn From Each Other

- Roman Frigg/Matthew C. Hunter (eds.), Beyond Mimesis and Convention. Representation in Art and Science. Dordrecht: Springer 2010. xxx, 265 p. [Price: EUR 149,75]. ISBN: 978-90-481-3850-0.

1. History of the Book

The editors held a conference on representation in the arts and the sciences at the London School of Economics and at the Courtland Institute of Art in 2006. Seven of the essays in the volume stem from that conference, four have been added subsequently.

2. Introduction by the Editors

The aim of the volume is explicitly stated as putting »works of art and theories of science ›to work‹ in a shared enterprise of thinking representation beyond mimesis and convention« (xxvi). There are two claims involved in this. The editors take the essays of the volume to be searching for an alternative to a mimetic and a conventionalist theory of representation. And they hope that the study of art and theory of science might fruitfully collaborate. Both ideas are neither trivial nor unproblematic, as the contributions to the volume show.

The dialogue or joint effort turns out to be a one-sided affair. Of the eleven essays, six stem from the philosophy of science. They are united in the general trend to try to take some concept from aesthetics and apply it to a well-known problem in the philosophy of science. Hunter's essay on Hooke's material models is hidden between other essays from the study of art, but turns out to be concerned with the history of science. Four essays stem from the study of art and are not so easily classified. The essays by Elkins and Hyman argue against a particular way of applying science to aesthetics or aesthetics to science that is ignorant of the other discipline. Schuld's essay describes an example of artists reacting to both scientific and artistic dogmas. None of these three essays tries to apply ideas from the philosophy of science to the study of art. Only Davies gathers argumentative resources from a debate in the philosophy of science and applies them to the problem of literary cognitivism. If aesthetics and the study of art can learn from science itself, this effort has not been undertaken.

How about mimesis and convention? As regards the discussion of models in the philosophy of science, the editors paint a picture of philosophers standing at the crossroads, confronted with two basic choices. Either they understand models in a structuralist way and subscribe to a mimetic theory of representation, or they understand models and representation in a purely conventional way. This picture has at least one flaw, as the editors concede: With one notable exception[1] nobody has taken the conventionalist route seriously. Therefore the essays on philosophy of science in this volume are better understood not as searching for a third route between mimesis and convention but as finding out about features of scientific models or representation without being committed to the structuralist idea. With regard to the study of art the

editors again see the distinction between mimesis and convention at work. But the three essays do not even aim at contributing to a theory of representation.

3. The Papers

3.1. Philosophy and History of Science

Most of the papers in the first part of the collection take their inspiration from the theory of fiction and try to apply these inspirations to the study of scientific models.

Catherine Elgin in »Telling Instances« understands scientific experiments as »vehicles of exemplification. They do not purport to replicate what happens in the wild. Instead, they select, highlight, control and manipulate things so that features of interest are brought to the fore« (6). Scientific models are seen as idealizations, which again represent by exemplification. This explains why science allows for models which in many respects do not match their objects and for models which do not actually exist: »If the sole objective is to exemplify […] particular properties, then in a suitable context, any symbol that exemplifies those properties will do. If a fiction exemplifies the properties more clearly, simply, or effectively than a strictly factual representation, it is to be preferred to the factual representation.« (8)

Nancy Cartwright pursues in »Models: Parables v Fables« a very similar idea. Building on previous work, she now characterizes scientific models as parables which, Elgin would say, exemplify their objects. But while Elgin and Cartwright both want to replace the idea of representation as mimesis with the more complex relation of exemplifying something in a certain respect, Elgin does not explain how science chooses that very respect. Cartwright is interested in the question how to arrive at the conclusions to be drawn from the model or, as she calls it, the moral, although her conclusion is purely negative: A scientific model or a scientific experiment »does not show what the generalizable conclusion is, how far up which ladder of abstraction one must climb to reach a result that will be true of new target situations as well or whether we can do so at all« (30).

Anjan Chakravartty, in his essay »Truth and Representation in Science: Two Inspirations from Art« is interested in approximate truth, the phenomenon that although two theories or models might both be wrong, we still want to declare that one of them is closer to the truth than the other. One could ask if truth is the right category to start with, especially when it comes to models, but Chakravartty does not do so. Instead, he distinguishes two kinds of not being true, abstraction and idealization. A theory of approximate truth has to take this distinction into account, he claims. Abstraction allows for a straightforward formulation of the idea of approximate truth. Some features of the target system are correctly described by the representation and the more features there are, the closer to truth the representation is. Idealization is more difficult: »For here, unlike in cases of pure abstraction, one does not have the luxury of representations that accurately characterize at least some nomically possible phenomena. Idealizations […] constitute not mere omissions, but distortions of things in the world.« (40) While this idea generally seems to be correct, the two proposed inspirations from art are rather disappointing. The contrast of the pair ›depiction/denotation‹ in art and the allegedly analogous ›truth/reference‹ in science remains vague. Do we really understand better what is going on in idealized representations by saying that such representations do not have to be true, but just have to refer to parameters of the target system? The second inspiration is kept equally vague. It leads Chakravartty to acknowledge pragmatic features of idealization without discussing them further. The claim that the tendency of Cubism and performance art »to-

wards attaching greater significance to processes involved in the creation of art« (47), is said to correspond to a trend in the philosophy and history of science to understand science not only as representing but also as intervening.[2] But this correspondence claim is puzzlesome and hardly illuminating.

The essays by Adam Toon, Roman Frigg and Manuel García-Carpintero constitute the heart of the collection. All three explore the idea that scientific models can be understood as fictions. **Roman Frigg**'s essay »Fiction and Scientific Representation« is the most thorough of the three. He not only motivates and elaborates the core idea by drawing on Walton's *Mimesis and Make-Believe*. He also takes serious the objection that to explain scientific modeling in this way means to explain *obscurum per obscurius*. He replies to this worry by showing that his theory can answer basic questions concerning identity conditions of models, how it is possible for a fictional model-system to have material properties, how it is possible to compare models and their target-systems and the like. Central to Frigg's version of the theory are two representation-relations, »p-representation (which holds between a prop and the imaginings that it mandates) and t-representation (which holds between a thus imagined system and a target-system in the world)« (121).

It is these two kinds of representation that are the main target of **Adam Toon**'s »Models as Make-Believe«. On his account »there are not two forms of representation relation, but only one, given by MM_1 [M model-represents T if and only if M functions as a prop in a game of make-believe in which propositions about T are made fictional]: the prepared description and equation of motion represent the bouncing spring directly, by prescribing imaginings about it« (84). Toon argues that assuming two types of representation (or taking the model-system to be a fictional object) does not solve the riddle of representation-without-represented-object, it is supposed to solve: »Even if we were to take the scientist's ether model to be a fictional entity, defined by whatever assumptions and equations they wrote down, we would still be left with the problem that this model […] seems intuitively to represent the ether, even though there is no ether.« (92)

Manuel García-Carpintero in »Fictional Entities, Theoretical Models and Figurative Truth« develops his own theory of fiction. His theory diverges from Walton-type accounts mainly in the interpretation of nonfictional utterances about fictional entities like »Zavalita is one of the most memorable fictional characters created by Vargas Llosa« (142). This is relevant, since García-Carpintero believes that it is more illuminating to compare scientific claims about hypothetical models to such utterances than to straightforward fiction-making utterances. If he is correct, this allows him to deal elegantly with cases of transfictional propositions like »The period of oscillation of the bob in the model is within 10% of the period of the bob in the system« (161). But García-Carpintero's criticism of Frigg's and Toon's theories is not entirely convincing. In answer e.g. to Frigg's method of prefixing certain claims, he just remarks that it is »not so easy to justify semantic claims to the effect that some class of statements should be understood as containing implicit prefixes or operators« (162). All three authors show that real insights are to be had by understanding scientific models as fictions. How exactly to paint the connection on the other hand still seems to be open to debate.

Matthew C. Hunter explores in »Experiment, Theory, Representation: Robert Hooke's Material Models« the representational status of two engravings by Robert Hooke. The essay is historically interesting, as it shows that »being able to harness a range of representations culled from the imaginative interpretation of physical processes was critically advantageous to the experimental philosopher« (215). It is unfortunate that Hunter does not connect his historical findings to the more systematic approaches in part one of the collection. He just states

that there is a connection in seeing »scientific models as stylized artifacts« (ibid.) without exploring this connection himself.

3.2. Aesthetics and Art History

David Davies tries in »Learning through Fictional Narratives in Art and Science« to defend literary cognitivism against noncognitivist arguments by linking this debate to the debate about the epistemological worth of thought experiments. The basic idea is that literary fiction can mobilize implicit understanding: »Such implicit understandings might then serve to justify our coming to believe the thematic contents we extract from the fiction« (65). But, Davies warns, »our sense that we are learning is trustworthy only in proportion to the adequacy of the unarticulated cognitive resources upon which we draw« (67). This might be true, but this reviewer confesses that he does not understand why one should accept the noncognitivist challenge of fiction or thought experiments in the first place, if it comes in the form of the question how we can learn anything from thought experiments or fiction *alone*. This presupposes that we do learn from isolated sources of knowledge without relying on background beliefs that stem from different sources, but the presupposition seems to be ill-founded and no cognitivist should accept it.

James Elkins' contribution »Visual Practices Across the University«, on first impression, does not look like an argument at all, but reads like an advertisement for and history of his recent book *Visual Practices Across the University*, from which he cites one chapter in full. Despite this appearance, Elkins shows quite convincingly how empty and unfruitful two ways of talking about (scientific) images are. The first is a certain type of generalized aesthetic perspective on scientific images which relies on concepts like ›beauty‹, ›richness‹, ›pattern‹, ›symmetry‹ and the like. The second consists in scientists reducing the interest of fine art to its scientific content. While Elkins' negative examples bring home the point about the uselessness of these ways of talking about pictures, and thereby give strong motivation to his project of surveying pictures from all branches of scientific study »as it presents itself, in its own languages« (191), his antitheoretical stance leaves the reader unsatisfied. One wishes for an explication of a positive concept of how to study visual representations that goes beyond looking at a wide range of pictures and explaining their respective function.

Dawna Schuld's essay »Lost in Space: Consciousness and Experiment in the Work of Irwin and Turrell« falls into two parts. She first places the work of Irwin and Turrell in its historical and intellectual context. These remarks are helpful and illuminating, although not all of them are equally convincing. That it were »developments in quantum mechanics and space exploration« (242) which set the stage for developments in cognitive science and, thereby, for Irwin and Turrell (cf. 227), is a claim which is neither plausible nor justified by Schuld. In part two, Schuld shows how Irwin's and Turrel's art »challenges central tenets of both disciplines from which it draws« (233), i.e. central tenets of art and psychology. Indeed both artists, in concentrating on bodily experience and introspection, create phenomena behaviorism cannot account for and at the same time challenge the aesthetic ideal of a disembodied experience of an aesthetic object in the limbo of the museum. The essay contributes to the wider theme of the collection, the dialogue of art and science, by describing one instance in which artists have taken up and modified influences from science and art in their work.[3]

Finally, **John Hyman** argues in »Art and Neuroscience« against Ramachandran's and Zeki's versions of so-called neuro-aesthetics. Neuro-aesthetics is an interdisciplinary approach to time-honored questions of aesthetics with neurobiological tools. This could be exciting from the perspective of interdisciplinary research. Unfortunately, the actual claims of

Ramachandran's and Zeki's neuro-aesthetics are overambitious and philosophically ill-founded. Hyman ridicules them with wit and sarcasm. The paper is illuminating and fun, but the easiness with which Hyman can brush aside the aesthetic (and sometimes also scientific) foundations of Ramachandran's and Zeki's work also shows that both never were serious dialogue partners and do not deserve the attention they get by Hyman. Like Elkins, Hyman convincingly argues how interdisciplinary work should not be done, but does not give a positive account.

4. Coda

Although the dialogue between philosophy of science and the study of art as represented in *Beyond Mimesis and Convention* turns out to be a one-sided affair, the volume makes for a good read not only for philosophers of science. With the small reservations mentioned the essays all make interesting and state-of-the-art contributions to their respective topics. And hopefully the future will bring positive accounts of inspiration from science or philosophy of science for the study of art that are as underrepresented in this volume as they are elsewhere in the literature.

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Notes

[1] C. Callander/J. Cohen, There Is no Special Problem About Scientific Representation, *Theoria* 55 (2006), 7–25.

[2] Cf. I. Hacking, *Representing and Intervening*, Cambridge 1983.

[3] In an effort to go beyond this historical standpoint, the editors additionally insist that »the work of Irwin and Turrell speaks instructively to recent research in cognitive neuroscience« (xxvi). This is an unconvincing claim which Schuld herself wisely does not make.