THE INFECTION TO THE BEST EXPLANATION: THE PROBLEM OF THE DESCRIPTION OF EVIDENCE TO BE EXPLAINED
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One of the central problems of the realism/anti-realism debate is the acceptance of scientific theories: What should the epistemological attitude of a scientist before a successful scientific theory be? Realists argue that the acceptance of an instrumentally successful theory implies the belief in its truth. An important realistic argument is that of the inference to the best explanation, formulated by Gilbert Harman, and from his statement we may then introduce the following argument: a) evidence E must be explained; b) hypothesis H explains E better than all other concurring hypotheses; c) conclusion: H is liable to the belief in its truth. This communication intends to present a difficulty in the establishment of premise (a) mentioned above, regarding the argument of the best explanation. The difficulty would be that the description of any evidence that needs to be explained cannot always be shared by the scientists that are involved in the search of such explanation. Thus, even though those scientists share the recognition of the importance concerning the specific evidence, the diversity of their investigative interests could lead them to assimilations that are distinct from the results of the research on the evidence. In the present work, the results of a historiographical investigation are presented and are intended to support the philosophical discussion about the assimilation, by some scientists in the beginning of the years 1950, of the statement proposed by Ronald Giere – “The X-Ray patterns of the DNA molecule must be explained” – to describe one of the main scientific problems in the molecular genetics.

A dialogic approach to abduction
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In this paper, abduction is analyzed integrating it within dialogue models. To do this, I consider abductive reasoning as a process of dialogue that moves forward as we are making / answering certain questions. It is crucial to take into account three essential characteristics of the abductive reasoning: it is plausible, tentative, and in consequence it is open to new data, and relative to a given context. I argue, therefore, that all abductive reasoning develops in a dialogue, which can be explicit or implicit (elliptical), and it will be within this framework from which should be considered. It is in this discursive context in which the "instinct" for the assumption or divination becomes conscious, voluntary and ultimately, logical. Therefore, it is from this perspective that can be analyzed and criticized at every turn.

If there is a character that agglutinates an exceptional abductive capability inside a dialectical frame, he is Sherlock Holmes. From one side, in his large number of cases we find an exemplary abductive methodology; on the other side, this methodology is contrasted and tested at every step and, at the same time, explained aloud within a persuasion dialogue in which Watson acts as a light conductor. As Sherlock Holmes declares in Silver Blaze: «Nothing clears up a case so much as stating it to another person». In summary, abduction, persuasion dialogue and Sherlock Holmes as a hinge in between will be the focus on this contribution. The first thing that I would like to show is that the abduction is an immediate inference to the best explanation that can (and must) be tested with a logical and methodological analysis; the second, it is that abduction takes place in a dialectical process which can be explicit or manifest or, alternatively, implicit or latent.

Representation and reconceptualization: the role of structures
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In this paper, we focus on the notion of structure as employed when considering models and representation in science. Structuralist approaches to scientific theories have a long and respectable tradition in the philosophy of science. In particular, the semantic view of scientific theories and recent versions of structural realism have notoriously contributed to the philosophical interest in the role of structures. Which kind of structure to consider with respect to models, and how this structure is used and related to a target system in order for the model to "represent", is a crucial point in the relevant literature. We focus on this very point and argue that a source of confusion in current debates has to do precisely with a misleading use of structures. More precisely, we find this use misleading in a twofold sense. First, for not clearly distinguishing between the two levels at which the
use of models (and related structures) takes place: the “object-level” of working scientists, where scientific theories are elaborated and tested, and the “meta-level” of philosophical analysis, where the results presented at the object-level are reconceptualized in terms of abstract structures such as sets or categories (we follow here the terminology used by French (2012) to distinguish the two levels). Second, for inadequately identifying the relevant structures at stake when considering the representational function of models. We argue for this point by using examples from physics, biology and economics.


Varieties of Misrepresentation and Homomorphism
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This paper is a critical response to Andreas Bartels’ (2006) sophisticated defence of a structural account of scientific representation. We show that, contrary to Bartels’ claim, homomorphism fails to account for the phenomenon of misrepresentation. Bartels claims that homomorphism is adequate in two respects. First, it is conceptually adequate, in the sense that it shows how representation differs from misrepresentation and non-representation. Second, if properly weakened, homomorphism is formally adequate to accommodate misrepresentation. We question both claims. First, we show that homomorphism is not the right condition to distinguish representation from misrepresentation and non-representation: a “representational mechanism” actually does all the work, and it is independent of homomorphism – as of any structural condition. Second, we test the claim of formal adequacy against three typical kinds of inaccurate representation in science which, by reference to a discussion of the notorious billiard ball model, we define as abstraction, pretence, and simulation. We first point out that Bartels equivocates between homomorphism and the stronger condition of epimorphism, and that the weakened form of homomorphism that Bartels puts forward is not a morphism at all. After providing a formal setting for abstraction, pretence and simulation, we show that for each morphism there is at least one form of inaccurate representation which is not accommodated. We conclude that Bartels’ theory – while logically laying down the weakest structural requirements – is nonetheless formally inadequate in its own terms. This should shed serious doubts on the plausibility of any structural account of representation more generally.