ABSTRACTS

C3.6 Metaphysical Issues in the Philosophy of Science

Ontic Structural Realism and Natural Necessity

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J. Ladyman (1998-2009), Ladyman and Ross (2007) refine J. Worrall's (1998) structural realism (SR), by developing an ontic structural realism (OSR) which they argue is a consistently naturalistic means of characterizing the ontology of fundamental physics. I argue that particular elements of M. Lange (2009) and M. Eklund (2006) strengthen and refine their project of characterizing fundamental physics via OSR and by extension, their presentation of information-theoretic structural realism (ITSR). I demonstrate this point by situating M. Lange’s (2009) discussion of nomological modality and natural necessity within Ladyman and Ross’s discussion of ITSR. The logical hierarchy evinced in Lange’s (2009) notion of ‘nomic stability’ further refines Ladyman and Ross’s claims through the addition of nuanced modal distinctions in a systematic framework. Moreover, I argue that what Lange considers are the ‘lawmakers’ (viz. subjunctive facts) serve as a de dicto rendition of some of Ladyman & Ross’s fundamental de re extensions and refinements of ‘real patterns’ (Dennett, 2001).

References

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Scientific Structuralism Does Not Necessitate Modal Realism

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In this paper we argue that the Modal Realism espoused by James Ladyman and Don Ross in their book Every Thing Must Go (2007, OUP: Oxford) is in conflict with the critical aspect of their program of naturalistic metaphysics. Ladyman and Ross criticize traditional metaphysics done without empirical constraints – what they call strong metaphysics. They contrast strong metaphysics with weak metaphysics based on Kitcherian unification. The metaphysical position Ladyman and Ross embrace is Ontic Structural Realism, wherein the structure is taken to be the objective modal structure of the world. In their (2007) and in various works by Ladyman a battery of arguments for Modal Realism is given. However, we argue that Modal Realism is not supported sufficiently by the special sciences or fundamental physics and that it does not do the unificatory work they claim is the only acceptable form of metaphysics. In addition, the motivation for Modal Realism seems to be similar to the motivation that traditional metaphysicians have for their strong metaphysical theses – that is explaining something psychologically mysterious or miraculous. Thus we claim that Ladyman and Ross face the following dilemma: either they have to (1) accept that they participate in strong metaphysics, or (2) dilute their Modal Realism to the point that it is indistinguishable from certain forms of antirealism. One additional justification that Ladyman and Ross give for Modal Realism rests on the fact that modal claims are indispensable in science. This might be true, but it is not sufficient to show that the world as such has an objective modal structure. We will outline an empirically equivalent interpretation of modal claims based on the works of V.W. Quine, James Woodward, Huw Price, Robert Brandom, and Jaakko Kuorikoski.

Structural Realism without Metaphysics; Notes on Carnap's reinvention of Ramsey-sentence approach

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Carnap’s reinvention of the Ramsey-sentence approach to scientific theories has been at the centre of a new debate in recent years. The credit of bringing back the subject to the foreground goes to Stathis Psillos (2000). Following Grover Maxwell, Psillos (2000a) argued that Carnap’s re-invention of the Ramsey-
sentence had failed to end in the desired neutral stance in the realism-instrumentalism debate, and led, instead, to a form of structural realism, which happened to be liable to Newman’s objection to Russell’s version of structural realism.

Friedman opposed Psillos by saying that Carnap’s mature conception of a scientific theory as the conjunction of its Ramsey-sentence and Carnap-sentence had indeed paved the way to the anticipated neutral position (Friedman 2009). Consequently, Friedman claimed that Newman’s objection, raised in the context of the recent debates about the structural realism, is no problem for Carnap’s conception of Ramsey-sentence approach (Friedman 2009).

My aim is to show that Carnap's reinvention of Ramsey-sentence approach to theories led to a singular and unorthodox form of structural realism, which is based on the practical methodological considerations, operating at the basic level of the construction (or choice of the rules) of the linguistic systems. To put the argument in a nutshell, it could be shown that the stance is an elaborated extension of realism, because, Friedman’s objection notwithstanding, a robust factual referential link can be established between the variables of Carnap’s structure and the facts of the matter. Interestingly, due to the non-semantic nature of the practical considerations which are restraining Carnap's pragmatic form of structural realism, this realist stance is not at odds with the metaphysical neutralism which Friedman has duly underlined in his representation of the Carnapian position.

An essentialist interpretation of Ontic Structural Realism

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The key thesis of the non-eliminative variant of Ontic Structural Realism is the Dependence Claim: objects are ontically dependent on the relational structures they participate in. The relation of ontic dependence in turn is usually explicated in terms of determining (grounding) facts of the numerical identity and distinctness of individual objects. That is, structural realists typically claim that relational facts ground facts regarding the numerical diversity of the relata. In my paper I propose to reinterpret the Dependence Claim in terms of the determination of counterfactual identity. More specifically, I suggest that ontic structuralists should shift their attention from the problem of how to account for distinctness among the elements of a given structure to the issue of how to identify these elements in various counterfactual situations. A structuralist answer to the latter problem should consist in an identification, for any object x, of a particular structure S(x) containing x and such that in a counterfactual scenario
(in a possible world) a possible object $x'$ represents de re the actual object $x$ iff $x'$ participates in a structure $S'(x')$ isomorphic with $S(x)$, with $x'$ being an image of $x$ in an appropriate isomorphism. The structure $S(x)$ can be called essential, since participating in it is an essential property of $x$ (i.e. a property such that without it an object would lose its identity). I will further argue that this essentialist form of ontic structuralism can receive substantial support from fundamental physical theories. For instance, the metrical structure of spacetime points can arguably be seen as constituting their essence. It can be also claimed that the fundamental state-independent properties of elementary particles determine their counterfactual identity while being structural in character, as they can be interpreted using group-theoretical concepts related to the underlying symmetries.