Organon F 24 (1) 2017: 114-134

Giacomo Borbone & Krzysztof Brzechczyn (eds.): *Idealization XIV: Models in Science* Brill, Leiden, 2016, 318 pages[1]

This latest addition to the Poznań Studies brings together thirteen contributions by fourteen authors, preceded by a foreword of the editors. As is tradition, the scope of the papers ranges from general problems in the philosophy of science to case studies from within particular disciplines, including sociology, historiography, economics and philosophy. The general tone of the volume is set by the subtitle: all of the studies deal, to varying degrees, with the relation between idealization and modeling, where the former is mostly understood in line with the so-called idealizational theory of science developed by the Poznań School centered around Leszek Nowak.

Reviewing a collection of studies on such a broad selection of topics can be demanding. To make this task easier for myself, I will proceed as follows. First, I shall briefly summarize the contents of each of the papers and, where possible, provide more detailed comments on topics related to my own areas of competence. I will conclude with some general observations on the collection.

The papers

The volume is divided into three parts, the first of which contains four papers dedicated to "General Problems" of idealization and modeling. The opening paper, by Xavier de Donato Rodríguez and José L. Falguera, applies Zalta's well-known theory of abstract objects to scientific theories and the theoretical entities referred to by theoretical terms. The authors propose to view theories as a specific kind of "stories", i.e., abstract objects, which (i) were deliberately authored (in this case, by members of the scientific community) and (ii) encode only propositional properties. They are distinguished from other kinds of stories (e.g., literary fiction) both by the fact that they contain generalizations and that there exists a non-abstract domain to which the "story" is intended by the scientific

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community to apply. Similarly, theoretical entities are viewed as abstract objects which do not exemplify existence (or any other properties of non-abstract objects) but which may encode certain properties exemplified by real-world, non-abstract objects.

However, the authors do not always abide by the crucial distinction between exemplifying and encoding. For example, on p. 36, they write that "the ideal gas is just an abstract object exemplifying certain properties attributed to it in the kinetic theory of gases", e. g., the property of *being composed of perfectly spherical particles*. However, as an abstract object, the ideal gas surely does not exemplify any such properties, encoding them instead.

Notwithstanding such minor issues, De Donato Rodríguez and Falguera's paper presents a promising framework for further thinking about models and the method of idealization, not least for its expressiveness. Among the notions that the authors attempt to explicate is that of the degree of idealization of a proposition. According to them, a proposition q is more idealized than p if the number of "defeaters" of p (propositions that are incompatible with p) is less than the number of defeaters of q. The definition (p. 35) apparently requires further work, as there seem to be an infinite number of defeaters in either case (if r is a defeater of p, then the proposition $r \vee s$ is also a defeater of p etc.).

Igor Hanzel's study is based on a critique of Nowak's reconstruction of Marx's *Capital*, as well as on an original analysis of Newton's *Principia*. It argues for a distinction between three types of scientific laws – the "pure idealized type" (of scientific law), the "inherent type" and the "inherent idealized type". Hanzel also proposes a typology of measures divided into "external measure", "immanent measure" and "manifestation of the immanent measure of the ground's cause", which is related to the threefold classification of laws.

The antecedents of the "inherent type" and the "inherent idealized type" involve the so-called "inherent conditions" which, according to Hanzel, necessitate the existence of the underlying cause (principal factor, "ground") itself. The knowledge of these conditions, Hanzel argues, enables two specific kinds of inference unrecognized by Nowak: in the first case, the inference from the knowledge of the origins of the principal factor to the characteristics of the principal factor itself, and in the second case, the derivation of phenomena (possibly including "new" ones, as yet unrecognized) from the principal factor that generates them.

However, the analysis is not completely satisfactory on both technical and textual grounds. With respect to the former, some crucial pieces of the puzzle are treated in a rather cursory way. For example, Hanzel argues that the expression "$E^{(k)} = f_k(H)$" ("the phenomenon E in its k-th degree of idealization is functionally

dependent on the principal factor H") in the consequent of a "pure idealized type of scientific law" cannot be simply "turned around", so that the left-hand side of the equation is swapped with its right-hand side (p. 48-49). But then the expression clearly is *not* an equation, and the use of the equals sign is misplaced. Similarly, the symbol $\rightarrow_n$ appears in both of the "inherent" kinds of laws. Hanzel characterizes it as a sentential connective meaning "if …, then necessarily comes into being" (p. 52). Again, the semantics of the symbol is left unspecified. One is led to doubt whether – given its characterization ("…*comes into being*") – it indeed is a *sentential* connective. Finally, the symbol "$\Rightarrow$" is introduced on p. 55 as a shorthand for "explanatory derivation", but the nature of this derivation is left undetermined.

Turning to textual issues, while I agree with the general drift of Hanzel's criticisms of Nowak's reconstruction of Marx's *Capital*, I think his proposals do not correspond to Marx's views all that more closely. Hanzel ascribes to Marx the view that the value of a commodity y produced in an enterprise owned by x ($V(y, x)$) depends on the socially necessary abstract labor expended on y in the enterprise owned by x ($L(y, x)$) (p. 52). However, the indexation of L by x is superfluous precisely because it is *social* labor that counts as value-determining (the same point applies to more complicated expressions involving surplus labor and surplus value on p. 55).

Moreover, according to Marx, the question to what extent a particular concrete labor is recognized as social is only ever settled *ex post facto*, in exchange. Therefore, the "inherent conditions" which, according to Hanzel, necessitate the transformation of products into commodities with value are not sufficient. For a product y to be a commodity and to have value, it is not enough that the enterprise producing y is privately owned by x and that x intends to exchange y for other products. In the extreme case, if y is never exchanged because it is not recognized socially (i.e., on the market) as useful, then there is no value of y to speak of, and indeed no social labor at all had actually been performed in x's enterprise. Hence, even though Hanzel emphasizes that L stands for abstract/social labor, the reconstruction ultimately ends up with something more akin to pre-Marxian labor theories of value where commodities are "impregnated" with value, once and for all, in the production process.

The paper by Lidia Godek deals with Max Weber's ideal types. Returning to Weber's original writings, Godek proposes a new reconstruction of his method of the construction and heuristic use of ideal types based on the Poznań idealizational framework. In contrast with the previous reconstruction within the same tradition, due to Izabella Nowakowa, she argues that Weber's principal method is that of positive potentialization – i.e., the counterfactual assignment of properties of maximum intensity to possible objects (ideal types).

Godek's paper is on the right track when it emphasizes the deficits of Nowakowa's analysis of ideal types. However, I think that it does not go far enough. Both authors miss the fact that when Weber discusses the construction of ideal types, he includes abstraction ("reduction" in Poznań parlance) and transcendentalization (the ascription of new properties) among the methods (Weber 1990, 30). Moreover, Godek's paper does not overcome the view that ideal types are chiefly classificatory instruments (p. 68). However, as noticed already by Hempel (1965), ideal types were intended as heuristic tools that should enable the explanation of social action. Godek provides no details about how this would work.[2]

The first part of the volume is brought to an end with Mieszko Ciesielski's paper on reduction. Ciesielski provides a case study, which tests the conception of reduction of idealized theories, originally developed by Katarzyna Paprzycka. The subjects of the test are the theory of a rational act and the theory of habitual-rational action. Ciesielski notes that on a strict approach, reduction between them is impossible. This leads him to weaken the conditions for reduction, arguing for a special treatment of theories in the humanities.

The focus of the volume's second part is "Idealization in the Social Sciences". Its five papers deal with economics, historiography and linguistics. Adolfo García de la Sienra's paper approaches the topic of models and idealization from a structuralist point of view. Using examples from economics, he shows how idealized models, via their concretization, are used to make empirical claims about real systems. De la Sienra's conception pays close attention to the distinction between a real system, a model system, the set-theoretical structure attached to the latter, a model of data ("empirical structure") and the "Gedankenkonkretum", which is the Marxian term for an initial representation of the target system.[3]

The paper by Łukasz Hardt develops an account of economic models as "believable worlds" which reconciles the view of models as isolations (Mäki, Nowak) with that of models as parallel realities or credible worlds (Sugden). On Hardt's account, economic models (such as Varian's model of sales which serves here as an illustration) are representations of mechanisms which provide us with justifiable

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[2] For an attempt at reconstructing explanation based on ideal types, see Halas (2016).

[3] However, de la Sienra also makes the rather controversial claim that the representation of an economic agent as rational (in the sense of transitivity of preferences) is not idealized. However, empirical studies of consumer behavior show that transitivity is routinely violated in the real world. It is not clear from de la Sienra's paper why the counterfactual assumption of rationality does not count as a case of idealization.

beliefs about the real world. As such, they are not simply true or false, but are used to maximize truth and minimize falsity in a wider system of beliefs about the real world.

Adam Czerniak's study links the "fallacy of reification of idealization" in economics to the global financial crisis. The fallacy occurs when the concretization of highly idealized models is omitted and the model is applied in a crude, direct way to real-world phenomena. Czerniak discusses the technical problems faced by attempts to concretize value-at-risk (VaR) and dynamic stochastic general equilibrium (DSGE) models in finance, and points out three more general reasons for the prevalence of reification of idealization in economics: the close ties between economics and policy-making, the lack of controlled experiments in (macro-)economics and the absence of firm theoretical foundations comparable with those of physics or chemistry. As one of the possible ways out, Czerniak suggests closer interaction of mainstream economics with heterodox traditions.

One of the editors, Krzysztof Brzechczyn, contributed a paper of his own. It is concerned with the reconstruction of methods of comparative analysis in historiography using the instruments of the idealizational theory of science. The source material for the reconstruction is provided by Skocpol's *States and Social Revolutions*. Brzechczyn arrives at a classification of comparative methods into those that compare cases of different kinds ("contrast-oriented method") and those that focus on cases of the same kind ("parallel method"). In both cases, he argues, the goal is to identify the main factors influencing a magnitude of interest. Brzechczyn concludes that this identification is never purely "inductive" and is always determined, at least in part, by theoretical preconceptions.

The second part of the volume concludes with Barbara Konat's study of the use of idealization in Chomsky's generative grammar. Already in Nowak's earlier work, Chomsky was viewed – along with Galileo, Marx and Darwin – as a pioneer of idealization in his respective discipline.[4] Konat provides a more detailed justification of this claim, focusing on the assumption of the ideal speaker-hearer. She concludes that Chomsky is indeed the "Galileo of linguistics".

The four papers which form the third part focus on "Idealization in the Humanities" – namely, in philosophy (metaphysics, political philosophy), strategic studies (scenario planning) and history.

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[4] Incidentally, I think this long-standing part of the Poznań School's web of belief is in need of revision. Marx was certainly not the first to use idealization in political economy, nor the first to reflect on its use methodologically. See, for example, the remarks made by John Stuart Mill in (1837), quoted in and discussed by Blaug (1992, 55-59).

Krzystof Kiedrowski analyzes the uses of idealization in Nowak's later project of "negativistic unitarian metaphysics". According to Nowak, this doctrine was itself constructed using the methods of idealization and concretization. Kiedrowski's paper refutes this claim and shows that the methods used are abstraction (the elimination of factors) and its converse, disabstraction (the re-introduction of factors). Given the complex (and perhaps overcomplicated) nature of Nowak's metaphysics, Kiedrowski's paper can be somewhat difficult to follow. However, the main message of Kiedrowski's paper, that there is much to be said in favor of abstraction and disabstraction as methods of theory construction, is commendable – including, I think, vis-à-vis Nowak's earlier project of reconstructing Marx's *Capital*.

Piotr Przybysz focuses on the role of idealization in Rawl's political philosophy. He reconstructs the idealizing assumptions involved in the "original position" and in Rawls' model of the person. He shows that the sequential introduction of the principles of justice can be seen as a process of concretization, i.e., the gradual elimination of idealizing assumptions. This leads him to view Rawls as yet another 20th century pioneer who introduced idealization into his discipline.

I do not find the parallel between Rawls and Galileo entirely convincing in the details. The methods of idealization and concretization, as discussed by Nowak, are concerned with quantitative assumptions about the (causal) influence of certain factors. On the other hand, the assumptions identified by Przybysz in Rawls are all qualitative, and rather inexact at that. The idealizational theory of science was at the outset formulated as a theory about how theories in *empirical science* are built, tested and used for explanatory purposes. The process of concretization was made dependent on empirical evidence about the phenomena. However, in a non-empirical enterprise like political philosophy, the criteria for concretization (e.g., approximation) would seem to have to be different. Przybysz simply presupposes that the concretized versions of Rawls' principles of justice are "more realistic". One is inclined to ask – more realistic on what standards, absent empirical testing?

The contribution by Zenonas Norkus discusses the role of idealization in scenario planning. It contains an interesting, albeit rather long review of the history of the field, including several examples. Norkus argues that scenarios involve a specific, "discursive" kind of idealization, which results in a stylized, hypothetical narrative about future developments based on the identification of certain key causal factors and their possible effects.

The final paper in the volume, by Piotr Szwochert, reviews and extends Brzechczyn's earlier contributions on the role of idealization in historical narration. The analysis of several examples leads him to distinguish two aspects of historical

narration, the "factographic" and the "persuasive", and to discuss the role of axiological assumptions in organizing the narrative.

Concluding remarks

Turning to the volume as a whole, a minor quibble has to do with its structuring. Of the four papers in the first part, only the first really deals with a general problem concerning modeling and idealization. The others approach the topic from the point of view of particular case studies (in physics, social science and philosophy) with less clear consequences for the general framework. As regards parts two and three, the underlying classification into social sciences and the humanities is not quite obvious: one paper dealing with historiography is located in the former part (Brzechczyn), while another in the latter (Szwochert). I should note that some of the papers would have benefited from stricter editing (e.g., Norkus' remark on aesthetics appears twice, verbatim, on p. 285 and p. 293).

Seven of the papers include a restatement of the basic principles of Nowak's idealizational theory. Although they differ stylistically, re-reading the elements of idealization does get tiresome after a while. Given that the tenets of Poznań School are already well established, perhaps the space would have been better used to extend the authors' own contributions. Nonetheless, the fourteenth volume of Idealization succeeds in showing that the tradition is alive, well, and fruitful as ever.

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