The "Science" in *The Science of Value*

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Abstract
This article examines the philosophy of science underpinning Michael Heinrich's case for a "monetary theory of value" in *The Science of Value (Die Wissenschaft vom Wert)*. Heinrich argues that Marx's labour theory of value is compromised by persistent ambiguities arising from a residual continuity with classical political economy. To address these limitations, Heinrich draws on Louis Althusser's concept of epistemological "breaks", contending that genuine scientific advancement requires a transformation of the prevailing "theoretical field". While this framework allows Heinrich to present Marx's theory as a scientific revolution, it also introduces a central epistemological problem: the incommensurability between old and new theoretical fields precludes the positive demonstration of the new theory's scientific superiority. The article concludes that Heinrich's framework, while valuable in rethinking Marx's theory of value, ultimately reproduces the circularity it seeks to overcome by relying on internal coherence without providing external criteria of scientificity.

Keywords
Michael Heinrich, Monetary theory of value, Critique of political economy, Scientific revolutions, Epistemological break, Louis Althusser, Philosophy of science

1. Introduction

As Riccardo Bellofiore notes in his contribution to this book symposium, Michael Heinrich's *The Science of Value* (*Die Wissenschaft vom Wert*) is nothing short of a classic in contemporary Marxist scholarship. First published in 1991, the volume has now reached its ninth reprint in the original German. Although the book has yet to be translated into English – the unofficial *lingua franca* of academic discourse – even a cursory bibliometric search highlights its prominence in the relevant debates.

This accomplishment is particularly remarkable given the declining influence of Marxist theory across many disciplines, and it must no doubt be credited to its expansive scope. According to the author, the book does not aim primarily at a «reconstruction of the critique of political economy»; instead, Heinrich's stated goal is «overcoming certain deficiencies of its categorical apparatus». A merely reconstructive approach, Heinrich contends, would assume that Marx's economic theory is inherently «unequivocal and correct» and requires only internal coherence[1]. By contrast, the fact that Marx's theory of money and value has lost ground to rival theories over the decades is taken by Heinrich as evidence of more deep-seated flaws. In particular, Marx's theory of value is for Heinrich marred by a «naturalistic» understanding of commodity-producing labour as mere expenditure of human energy, which Marx uncritically inherited from classical political economy[2]. To be sure, Marx famously acknowledged that human labour can only produce commodities once labour power has been sold in exchange for money: only after this exchange does labour enter the production process. However, this characterization of commodity-producing labour as the *social*

[1] See Heinrich's introduction to the book.
[2] See chapter 6.

product of exchange coexists with the *naturalistic* idea that the value of commodities can be measured accurately by the amount of labour time required to produce them.

According to Heinrich, this ambiguous characterization of value is the ultimate source of some well-known problems in Marx's critique of political economy, such as the notorious "transformation problem": on the "naturalistic" understanding, value measures an objective feature – namely, the quantity of labour necessary to produce commodities – which is preserved throughout the economic process that ultimately leads capitalists to sell commodities for a profit. The relationship between the production and distribution of commodities in the marketplace thus involves a mere "conversion" of fixed quantities, raising the problem of how the labour content of a commodity translates into its market price[3].

Significantly, the implications of these problems are not confined to the narrow boundaries of economics. According to Heinrich, the adoption of some key ideas of classical political economy also impinges on Marx's (and Engels's) conception of socialism. In the *Critique of the Gotha Programme*, Marx famously describes «communist society» as «emerging from capitalist society» and therefore as «stamped with the birthmarks of the old society from whose womb it emerges». This is why, according to Marx, in the early stages of the transition to communism «the same principle prevails as in the exchange of commodity equivalents: a given amount of labour in one form is exchanged for an equal amount of labour in another form»[4]. That such a principle can be retained in a post-capitalist society attests to the fact that Marx viewed the market-based exchange of commodities as a mere device for exchanging equal quantities of the same substance, as per the "naturalistic" theory of value.

The political implications of this view are most evident in Engels's considerations on socialism in Part III of *Anti-Dühring*. Even after the capitalist production of commodities has been overcome, Engels argues, socialist society would still need to «know how much labour each article of consumption requires for its production» in order to organize the production plan. Insofar as Marx and Engels equate the value of commodities with the labour time necessary for their production, they are led to assume that its measure can be determined *before* commodities are exchanged in the marketplace. The transition from capitalism to socialism can thus be conceptualized as the implementation of a form of economic planning in which the «government of persons» is replaced by «the administration of things»[5]. For Heinrich, the fact that twentieth-century attempts to replace capitalist production with planned administration led to bureaucratic domination demonstrates that the ambiguities in Marx's theory of value also carry political consequences.

For all these reasons, Heinrich submits that a "monetary theory of value" is required for overcoming the "naturalistic" remnants of classical political economy. According to this theory, commodity-producing labour is to be understood as the *social* product of the sale and purchase of labour power. From this perspective, monetary exchange plays an active role in the production of value, implying that the final sale of commodities in the marketplace is the site in which labour effectively becomes a value-producing activity. Such a monetary theory not only eschews the problems inherent in a pre-monetary theory. As Heinrich mentions in chapters 7 and 8, assigning a prime role to the monetary form of value also leads to viewing capitalist crises – including the most recent financial crises – as the product of an inherently unstable economic system in which the conditions for the final realization of profits cannot be secured in advance.

2. Marx's "scientific revolution"

Notwithstanding Heinrich's scepticism towards the possibility of "reconstructing" Marx's theory of value as a consistently unified economic framework, his monetary theory nonetheless builds on

[3] See chapter 7.
[4] Marx (1991, 86).
[5] Engels (1987, 268).

Marx's own advances over classical political economy. According to Heinrich, the non-naturalistic aspects of Marx's theory of value already lay the groundwork for a full-fledged monetary theory of value. In this sense, Heinrich speaks of a veritable «scientific revolution» that Marx effected in relation to classical political economy. The Kuhnian terminology that Heinrich deliberately employs here is no mere philosophical embellishment. Quite on the contrary, Heinrich's framing of Marx's contribution in terms of a "scientific revolution" serves as a conceptual tool for underpinning one of the book's most original claims – namely, that there is a fundamental theoretical continuity between classical political economy and neoclassical economics. By demonstrating that late 19th-century neoclassical economics inherited the theoretical framework of classical political economy, Heinrich shows that Marx's critique of classical political economy can also function as a pre-emptive critique of the neoclassical mainstream in contemporary economics.

To show that Marx's critique amounts to a genuine "scientific revolution", Heinrich introduces a conceptual distinction between the assumptions of a theory, referred to as its «problematic» (*Problematik*), and the broader «theoretical field» in which those assumptions are embedded. Heinrich illustrates that the marginal revolution in economics did in fact entail a radical change in "problematic" vis-à-vis classical political economy. In marginalism, utility replaced labour as the basic unit of economic analysis, and consumers supplanted producers as the key actors in the economy. Consequently, the subject matter of economic analysis shifted from macroeconomic to microeconomic phenomena, and "the economy" was recast as an aspect of human behaviour rather than as a separate sphere of society[6]. Radical differences in "problematic" can also be observed *within* the "classical" or "bourgeois" political economy which Marx criticised. "Scientific" political economy (as Marx termed it in *Theories of surplus value*) adopts a labour theory of value and seeks to account for different forms of value – profit, rent, income – as all originating from labour. On the other hand, "vulgar" political economy rests content with acknowledging a variety of factors of production – the "trinity formula": capital/profit, land/ground-rent, labour/wages – and therefore aligns more closely with the marginalist problematic by taking the differing needs of economic actors as its starting point[7].

Despite these differences in problematic, however, Heinrich argues that both neoclassical economics and classical political economy – whether in its "vulgar" or "scientific" variant – are situated within the same "theoretical field", defined by the following key tenets:

- *Anthropologism*, whereby the behaviour of economic actors is assumed to be the direct expression of "human nature".
- *Individualism*, whereby society is assumed to be made up of atomised individuals.
- *Un-historicity* (*Ungeschichtlichkeit*), whereby societal and economic arrangements are seen as conforming to (or as failing to conform to) the "human nature" of atomised individuals.
- *Empiricism*, whereby economic analysis can only be based on the observable behaviour of economic actors.

Famously, Heinrich argues, Marx and Engels openly distanced themselves from Feuerbach's «philosophy of (human) essence» as early as 1845[8]. By abandoning the essentialist idea of human emancipation as the starting point for the critique of bourgeois political economy, Marx and Engels also relinquished any residual *anthropologism*. In *The German Ideology*, Marx and Engels further outlined a «materialist conception of history» wherein social relations (specifically relations of production) replace individuals and their needs as the fundamental building blocks of social reality. For Heinrich, this shift signifies that Marx's mature theorising was not only free of *individualism*; its assumptions are also incompatible with *un-historicity* – since social relations are inherently historical – as well as with *empiricism* – since social relations, as Marx acknowledged in the 1857

[6] See chapter 2, sections 3 and 4.
[7] See the section on *Revenue and Its Sources* in Marx (1989).
[8] See Marx and Engels's changing opinion on Feuerbach's philosophy from Marx's *Economic and Philosophic Manuscripts of 1844* to their jointly authored *Theses on Feuerbach* and *The German Ideology*, in Marx, Engels (1975; 1976).

Introduction[9], are unobservable[10]. In this way, the break with the theoretical field of classical political economy is consummated.

3. The scientific status of Marx's revolution

Drawing on the work of such philosophers of science as Imre Lakatos and Thomas S. Kuhn, Heinrich defends the post-Popperian idea that scientific progress occurs within the framework of underlying theoretical assumptions and broader conceptual structures. Lakatos described them as «research programmes», while Kuhn referred to them as incommensurable «paradigms» or, in his later terminology, «disciplinary matrices». Kuhn's seminal work, in particular, demonstrated that scientific progress regularly entails «paradigm shifts», whereby the entire theoretical framework of a previously accepted scientific theory is replaced by a new one[11]. According to Heinrich, however, Kuhn's notion of a "paradigm shift" fails to fully capture the true stakes of Marx's scientific revolution. Kuhn's reconstruction of the structure of scientific revolution ultimately sought to preserve some internally consistent rationality in scientific progress even across incommensurable paradigms[12]. For Heinrich, on the other hand, the kind of theoretical transformations that Marx introduced involve a fundamental reconfiguration of the way scientific objects are conceptualised according to the prevailing scientific rationality. For this reason, the concept of "theoretical field" is required.

Heinrich's distinction between a "problematic" and the underlying "theoretical field" is meant precisely to capture the deep changes that scientific revolutions introduce in the «fundamental structures of perception» (*fundamentale Wahrnehmungsstrukturen*) of the members of the scientific community – what Marx referred to in *Capital* as «objective forms of thought» (*objektive Gedankenformen*) – in contrast to the more transient "problematics". Because of these changes, Heinrich deems it impossible to provide a purely "internal" account of scientific development. This is why Heinrich speaks of scientific revolutions in terms of a "break" (*Bruch*) with the prevailing theoretical field. The radical discontinuity entailed by such "breaks" leaves no room for deducing any standard of intellectual progress from the "rational reconstruction" of scientific development, to use Lakatos's phrase[13]. The possibility of such a reconstruction would presuppose that theory change is governed by an internal logic that allows theories to be *compared* notwithstanding their *incompatibility*. Even Kuhn's "paradigm shifts" are the result of choices made by the scientific community on the basis of meta-theoretical criteria – such as the ability of the new paradigm to solve the problems that led the old one to a crisis or, more often, its promise to guide future research on the problems to which the old paradigm offered no solution. And although scientists may in practice be drawn to a new paradigm for its purely "aesthetic" appeal – since the new paradigm may appear "neater", "more suitable", or "simpler" than the old one – these seemingly extra-scientific features are in fact implicitly regarded by scientific practitioners as indicators of the paradigm's potential for future results[14].

Heinrich's concept of "theoretical field" rules out the possibility of reconstructing any such logic. Since breaking with a theoretical field entails a change in the «fundamental perceptive

[9] See, in particular, the section titled *The Method of Political Economy*. In it, Marx writes, among other things: «The concrete is concrete because it is a synthesis of many determinations, thus a unity of the diverse. In thinking, it therefore appears as a process of summing-up, as a result, not as the starting point» (Marx 1987, 37).
[10] See chapter 4.
[11] Kuhn (2012).
[12] Although this is a highly debated issue in post-Kuhnian philosophy of science, Kuhn made his standpoint clear in a number of essays written after *The Structure of Scientific Revolutions*, including the aforementioned *Postscript* to the second edition and the essays collected in Kuhn (1977).
[13] Lakatos (1970). The phrase "rational reconstruction" (*rationale Nachkonstruktion*) was first used, in a slightly different sense, by Rudolf Carnap (2003).
[14] See T.S. Kuhn (2012, chapter 12).

structures» or «objective forms of thought», the old and new fields cannot be compared on the basis of shared criteria[15]. This, however, leaves open the question as to what makes a "break" with a pre-existing theoretical field a truly scientific advancement. If the monetary theory of value addresses an altogether different object vis-à-vis pre-monetary theories of value, what makes their corresponding "theoretical fields" comparable? If the transition to a monetary theory of value involves a change in the "fundamental perceptive structures" of scientific thought, by what standards can it be judged scientifically superior to classical political economy and neoclassical economics? In short, on what grounds does the "science" in *The Science of Value* rest?

4. Heinrich's historical epistemology

Although Heinrich does not address these questions explicitly, his conceptual and terminological choices may hint at some tentative answers. Despite Heinrich's limited and ambivalent references to Louis Althusser's work throughout the book, the key concepts of his philosophy of science – "theoretical field", "problematic", and even "break" – are obvious loans from the Althusserian strand of Marxism. Heinrich's debt to Althusserianism also extends to the idea that science operates on pre-existing conceptualizations rather than on brute facts, as well as to the periodization of Marx's "break" with the classical tradition after 1845[16]. In adopting this theoretical framework, Heinrich aligns with Althusser's view that scientific revolutions – or, in his parlance, "epistemological breaks" – involve the construction of new objects of scientific investigation rather than the collection and accumulation of more accurate data about reality. As Althusser put it in regard to Marx's critique of political economy: «"To criticize Political Economy" means to *confront* it with a new problematic and a new object: i.e., to question the very *object* of Political Economy»[17].

Althusser's ideas are highly indebted to the French tradition of "historical epistemology", a term coined by Georges Canguilhem and later popularized by Dominique Lecourt[18]. A distinctive trait of this tradition is its focus on the internal dynamic of science as a process of conceptual self-criticism and rectification of prior misconceptions. From the French tradition of historical epistemology, Althusser also inherited the view that scientific revolutions occur in the form of "epistemological breaks" – a concept he famously readapted from Gaston Bachelard's work – which pose new problems and transform the object of inquiry by means of criticism of the existing theoretical framework[19]. According to Althusser, it is only by filling the "lacunae" or "gaps" in the problematic of classical political economy that Marx was able to outline what Heinrich would call a (truly scientific) *monetary theory of value*. In this respect, Heinrich's perspective aligns with Althusser's. His understanding of scientific objects leads to grounding epistemological breaks in the immanent logic by which those objects are *constructed* rather than in an «overarching rationality of science» (*übergreifende Rationalität der Wissenschaft*).

In this way, the question of scientific advancement is neither directly addressed nor eluded but instead deliberately *displaced*. As Althusser put it, to establish *a priori* guarantees of scientific knowledge on grounds other than the break itself amounts to subscribing to an idealistic «theory of knowledge»[20]. His alternative solution rests on the crucial distinction between *science* and *ideology* as exhaustive categories. In fact, one may go so far as to argue that Althusser's most innovative contribution to the French tradition of historical epistemology is his recasting of science in terms of an "epistemological break" with ideology rather than with the "epistemological obstacles" posed by

[15] Marx (1967, 76).
[16] See Althusser (2005). On Heinrich's relation to Althusserianism see Morfino (2023).
[17] Althusser (2016b, 310).
[18] Lecourt (1975).
[19] Althusser (2005, part 6).
[20] Althusser (2016a).

commonsense notions, as per Bachelard's original notion. This, Althusser contended, provides an alternative way of framing the status of scientific knowledge which avoids the "idealistic" search for *a priori* guarantees. By emerging from the inevitable "lacunae" of a pre-scientific theory, Althusser argues, the kind of knowledge produced by the "epistemological break" is able to fill them and therefore expose the theory as non-scientific *ideology*.

5. The circularity problem

One may wonder whether this move satisfactorily displaces the "idealism" implicit in the "problem of knowledge" without leading to further issues. As Pierre Macherey clarified in an essay that inspired some of Althusser's ideas on the relationship between science and ideology, grounding science exclusively on its own production process implies that the question «What is science?» has «no meaning except in relation to its real […] conditions, that is, to the history of science. Science's status can only be defined inside that history». This also means that «we can't say that science replaces ideology, nor that science is preferable or superior to ideology. Science isn't "better" than ideology since precisely these two terms can't be compared»[21]. This tension is reflected in what Jacques Rancière, Althusser's former collaborator on *Reading Capital*, called a "seeming paradox in Althusser's project." This paradox stems from an oscillation between *discontinuity* and *continuity* in his account of the production of scientific knowledge. On the one hand, the *gaps* in the existing problematic are the immediate pre-condition for an epistemological *break* with ideology. On the other, some *continuity* is implicitly presupposed insofar as the break establishes itself against it[22].

Many authors commented on the circularity that this paradox leads to. Echoing Rancière, Peter Dews noted: «If […] the propositions of a science are seen as so closely interrelated that none can be changed without altering the sense of all the others, then each theory will determine its own set of "facts" and there will be no common world of reference shared by different theories»[23]. According to Dews, identifying the mere occurrence of epistemological breaks is no adequate foundation for science: «the objective history of science which Althusser supposes possible fails to provide a normative criterion for knowledge. And however much he twists and turns, Althusser cannot avoid the need for such a criterion»[24]. Expanding on this, Gregory Elliott remarked that Althusser's «(negative) demarcation of theoretical ideology from science is not a (positive) specification of the scientificity of science»[25]. And although this move is central to Althusser's anti-idealistic view of science, «[w]ithout positive, compelling criteria of scientificity, Althusser's bid for historical materialism is imperilled and […] "the theory […] of what constitutes the scientificity of the sciences" […] itself founders as a satisfactory account of science»[26].

Whatever the nature of Heinrich's intellectual debts to Althusser's views, his notion that the objects of science are conceptually *constructed* through what he calls a "theoretical field" – in conjunction with his account of Marx's scientific revolution in terms of a "break" with the theoretical field of classical political economy – seems to fall into a similar circularity. Insofar as the monetary theory of value shifts the focus of economic analysis away from individual preferences, Marx's "break" with the corresponding theoretical field may very well be viewed as the construction of a new scientific object. Having ruled out the possibility of establishing any standards of scientific progress without disregarding the fundamental changes introduced by a break, the tenets of the theoretical field with which Marx breaks – namely anthropologism,

[21] Macherey (1986, 124).
[22] Rancière (2004, 135-136).
[23] Dews (1994, 130).
[24] Ivi, 138.
[25] Elliott (2006, 85).
[26] Ivi, 86.

individualism, un-historicity, and empiricism – can only be seen as limitations from the point of view of Marx's monetary theory of value.

At the same time, however, Heinrich seems to assume that pre-monetary theories (both classical and neoclassical) can be evaluated on the basis of independent criteria. On one hand, he ascribes the success of the marginal revolution in the late 19th century to its emphasis on price theory, which enhanced its scholarly relevance amid the growing demands of the industrial proletariat for shorter working hours, public housing, social security, progressive taxation, and similar reforms. On the other, he criticizes the theories of marginal utility and of general equilibrium for their unrealistic or scarcely operationalizable assumptions about individuals' preferences and behaviour in the market. Heinrich's view of the history of economic thought thus retains the implicit notion that scientific advances are made on the terrain of the explanation of phenomena: his critique of pre-monetary political economy insists on the objective explanatory limitations of the underlying theoretical framework, and his case for a monetary theory of value rests on its greater explanatory power vis-à-vis pre-monetary theories. Although Heinrich's professed philosophy of science rules out direct comparisons between theories, his need for scientific standards leads him to presuppose an inherent continuity as the precondition for scientific advancement.

6. Conclusions

As mentioned at the beginning, *The Science of Value* has rightfully earned its place as a valuable classic in Marxist scholarship. This fate is yet another shared trait between Heinrich and Althusser. As Elliott noted, Althusser's single greatest contribution was to help renew Marxism across a variety of domains, as evidenced by his vast influence in many social science disciplines. Yet this happened «in spite of Althusser's epistemological protocols» rather than because of them[27]. In a similar vein, Heinrich's main contribution to Marxist scholarship lies less in its epistemological vindication of Marx's scientific revolution than in the way it recasts Marx's critique of political economy as a monetary theory of value. One cannot be but sympathetic with Heinrich's departure from the crude, Whiggish notion of "scientific progress" that characterized much of twentieth-century philosophy of science. However, his alternative view of the history of science does not do justice to the potential that the monetary theory of value has for understanding contemporary capitalism – and, consequently, for outlining the prospect of a post-capitalist society. To quote a passage from Lenin, much appreciated by Paul K. Feyerabend: «history as a whole, and the history of revolutions in particular, is always richer in content, more varied, more multiform, more lively and ingenious than is imagined by even the best parties, the most class-conscious vanguards of the most advanced classes»[28]. If anything, Heinrich's *The Science of Value* seems but to confirm this pronouncement.

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[27] Ivi, 308.
[28] Lenin (1966, 95), cited in Feyerabend (1993, 9-10, 107).

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