

## Chapter 6

### Notes on philosophy and science

Note: This chapter disposes of a number of loose ends in our reply to North and the Talbots that did not easily fit in with the previous chapters. Part 1 is an extended comment on North's reflections on alienation and teleology. Part 2 is a discussion of the dialectical synthesis between the history of scientific discovery and the content of scientific concepts. It is a response to a comment made by the Talbots about an important event in the historiography of science.

#### Part 1: A note on alienation and teleology

In Part II of his *Odyssey* series David North includes several footnotes challenging me on theoretical issues.<sup>1</sup> With one exception, none of these notes have any independent significance. They simply rehash old arguments and distortions of our position to which we have already replied. The sole exception is footnote #3, where North momentarily departs from his litany of smears to introduce a long discussion of my treatment of the themes of alienation and teleology. Here it is in full:

3. Upon reviewing *Alienation and Revolution* more recently in the context of Steiner's subsequent evolution, it became evident that his present conceptions found embryonic expression in this essay. The theoretical framework of Steiner's essay developed out of Marcuse's existential and ahistorical conception of "man's essential nature," which Steiner adopts uncritically. Thus, we encounter in Steiner's document the claim that "Man's essential nature is defined by the reciprocal interaction between man's needs and his capacities." Later, he asserts that "Marx's conception of man's essential nature has unfortunately remained an incomprehensible black box to all but a few commentators." In this context, Steiner refers specifically to the work of Horkheimer, Theodore Adorno "and most significantly, Marcuse." Steiner's presentation, like that of Marcuse, rips Marx's 1844 Manuscripts out of its historical and intellectual context. Steiner's essay goes so far as to interpret Marxism as an exposition of the teleological unfolding of "man's essential nature." This has nothing whatsoever to do with Marxism, which emphatically rejects teleology. As Marx deepened his critique of Hegelian idealism and the anthropologism of Feuerbach, he ceased to speak of a "human essence" or "essential nature" existing above and outside the historical development of man's social relations of production. Thus, in his *Theses on Feuerbach*, written in 1845, Marx states that "the human essence is no abstraction inherent in each single individual. In its reality it is the ensemble of the social relations" (Moscow: Progress Publishers, 1973, p. 64). In subsequent writings, on the basis of the newly-elaborated materialist conception of history, Marx and Engels subjected to withering criticism attempts to dissolve the real, existing, historically-specific man, conditioned intellectually and practically by definite social relations of production, into a

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<sup>1</sup> David North, *The Frankfurt School vs. Marxism: The Political and Intellectual Odyssey of Alex Steiner - Part II*, Oct. 23, 2008, <http://wsws.org/articles/2008/oct2008/fran-o23.shtml>

philosophically-conceived abstract man. In this regard, their critique of Max Stirner ("Saint Sancho") is especially apposite. Stirner presents any object or relation whatsoever as that which is alien to the ego, as the alienation of the ego; on the other hand, Saint Sancho can, as we shall see, also present any object or relation as something created by the ego *and belonging to it*. Apart, first of all from the arbitrary way in which he presents, or does not present, any relation as a relation of alienation (for everything can be made to fit in the above equations), we see already here that his only concern is to present all actual relations, [and also] actual individuals, [as alienated] (to retain this philosophical [expression] for the time being), to [transform] them into the wholly [abstract] phrase of alienation (*The German Ideology, Collected Works*, Volume 5 (New York, International Publishers, 1976), p. 281, brackets in the original text).

Marx's historical materialist critique and reworking of the concept of alienation is most richly developed in his *Grundrisse*, written in 1857-58, in which he insists that the individuality of man and his alienation is the outcome of an historically-determined social process. As Marx explains:

...Universally developed individuals, whose social relations, as their own communal [*gemeinschaftlich*] relations, are hence also subordinated to their own communal control, are no product of nature, but of history. The degree and the universality of the development of wealth where *this* individuality becomes possible presupposes production on the basis of exchange values as a prior condition, whose universality produces not only the alienation of the individual from himself and from others, but also the universality and the comprehensiveness of his relations and capacities (*Grundrisse: Introduction to the Critique of Political Economy*, tr. Martin Nicolaus (Middlesex, England, 1973) p. 162).

*Alienation and Revolution* is posted on the Steiner/Brenner web site. It is dated May 1997, but the version presented on the web site is the substantially redrafted document that was completed in early 1999.

The topics covered here are huge and I will make no pretense to disposing of them in a few paragraphs. Suffice it to say that North, as usual, completely misrepresents my position, but even worse, his few remarks here about alienation, teleology and man's essential nature shows that he interprets Marxism as a form of vulgar materialism. I will go through some of these issues briefly.

## Marx on essentialism and alienation

North completely misrepresents my essay on alienation.<sup>2</sup> He claims that, "the theoretical framework of Steiner's essay developed out of Marcuse's existential and ahistorical conception of "man's essential nature," which Steiner adopts uncritically." Anyone who takes the trouble to read my essay on alienation will readily see that the core concepts are taken not from Marcuse but Aristotle, Hegel and Marx. Furthermore, I was led to an understanding of the importance of essentialism in the thought of Marx through a reading of Scott Meikle's 1986 book, *Essentialism in the Thought of Karl Marx*.<sup>3</sup> My essay made the point that Marx's theory of alienation cannot

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<sup>2</sup> Alex Steiner, *From Alienation to Revolution: A Defense of Marx's Theory of Alienation*, [http://permanent-revolution.org/essays/alienation\\_revolution.pdf](http://permanent-revolution.org/essays/alienation_revolution.pdf)

<sup>3</sup> Scott Meikle, *Essentialism in the Thought of Karl Marx*, (Open Court, 1986.)

be properly understood without a grasp of Marx's essentialism. North's reaction to my essay is an apt confirmation of this thesis.

Marcuse plays no role at all in the theoretical framework for my essay. I mentioned him only in the context of his pioneering work in engaging with and commenting on Marx's theory of alienation after the publication in the 1930's of Marx's *Economic and Philosophical Manuscripts of 1844*. Indeed it would be odd to not acknowledge Marcuse's role in bringing to light Marx's work given that his essay, *The Foundation of Historical Materialism*,<sup>4</sup> contained the first serious commentary on the 1844 Manuscripts.

The connection between essentialism and alienation is located in the concept of human nature. As the concept of alienation does not stand alone but only acquires meaning in contrast to and as a perversion or a distortion of what we naturally are, the exploration of human nature is thus fundamental. The positing of human nature in turn requires that we take seriously the existence of essential natures, i.e. the thesis of essentialism. These are difficult philosophical issues that North, in a manner typical of his style, brushes off with a quote from Marx or Engels.

The original notion of essentialism goes back to Aristotle, who was the first to articulate that any definition of a substance must connect a universal together with a particular. With this pretty much everyone would agree. The status of that universal is what becomes controversial in the history of philosophy. The essentialist position is that the universal is in some sense real and is an avenue to what may be called an "essential nature" of the object under investigation. The empiricist position is that the universal is little more than a convenient fiction by which we draw a generalization from the accumulation of particulars, which are in the end the only entities that are real. (The English empiricist John Locke famously said that substance is "An I don't know what" within which properties inhere.) Hegel appropriates his understanding from Aristotle, but reconceives it as a process in formation through history. In that sense, Hegel's famous phrase, "substance becomes subject" enters into the lexicon. An "essential nature" is now a product of a specific historical development and is no longer static, but dynamic and malleable in accord with the logic of its immanent development. This is further reworked by Marx who traces man's "essential nature" back to historically specific modes of production and class relations whereby our "metabolic interaction with nature" occurs.

North butchers this understanding of essentialism as it has evolved from Aristotle to Hegel to Marx by equating it with a Platonic universal that is at once ahistorical and dematerialized. To justify his rejection of essentialism, he quotes Marx lampooning of Max Stirner to make his point. But Stirner and some of the other Left Hegelians really were employing empty categories in their pronouncements, a strategy that richly deserved the parody it got. That North cannot tell the difference between Aristotle's or Hegel's or Marx's discussion of universal categories from the subjective and capricious use of Stirner is an indication that North has never thought about these issues beyond their value for amassing quotes in the service of a dishonest polemic.

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North was well informed of the importance I attributed to Meikle's book as we held a number of conversations about it in the late 1990's and for a period he too considered it important enough to recommend to other members of the SEP. His belated attribution of Marcuse as one of the key sources for my essay is thus thoroughly disingenuous, meant only to add fodder to his specious allegation that I am a follower of the Frankfurt School.

<sup>4</sup> Herbert Marcuse, *Studies in Critical Philosophy*, Beacon Press, Boston, 1972.

<http://marxists.org/reference/archive/marcuse/works/historical-materialism/index.htm>

The original German version of the essay appeared in 1932.

In my essay on alienation I explained that Marx's concept of alienation only gains coherence once it is grounded in his essentialism. Alienation only attains significance when seen against the background of what man is. It is nothing less than a perversion of man's essential nature. This is beautifully expressed in the following excerpt from the *Economic and Philosophical Manuscripts of 1844*:

Conscious life activity distinguishes man immediately from animal life activity. It is just because of this that he is a species being. Or rather, it is only because he is a species being that he is a conscious being, i.e., that his own life is an object for him. Only because of that is his activity free activity. Estranged labor reverses this relationship, so that it is just because man is a conscious being that he makes his life activity, his essential being, a mere means to his existence.

In creating a world of objects by his practical activity, in his work upon inorganic nature, man proves himself a conscious species being, i.e., as a being that treats the species in its essential being, or that treats itself as a species being.<sup>5</sup>

In the 1844 Manuscripts Marx is using the term "species being" to denote man's essential nature. I explained in my essay that while the term is borrowed from Feuerbach, Marx gives it a very different content:

In the *1844 Manuscripts*, Marx repeatedly uses Feuerbach's terminology of "species being" to refer to man's essential nature. However, while the words are Feuerbach's, the content is Marx's. "Species being" no longer connotes an abstract humanity divorced from specific historical expressions. The term is now used in the sense of a universal essence that contains rather than excludes all the specificity of man's successive modes of social relations. It was Feuerbach's abstract use of the term that Marx criticized in the 6th Thesis on Feuerbach where he wrote,

"Essence, therefore, can be comprehended only as 'genus' as an internal, dumb generality which naturally unites the many individuals."

Nevertheless, Marx did not again employ the term "species being" following the *1844 Manuscripts*. Subsequently, Marx would prefer to employ the concept of "socialized labor", emphasizing that man defines himself historically through the evolution of production relations."<sup>6</sup>

I argued in a footnote that,

The fact that Marx dropped the term "species being" in his later writings has been cited by more than one commentator as evidence that Marx's thinking went through a philosophical conversion following the *1844 Manuscripts*. While it is doubtless true that Marx dropped the Feuerbachian terminology to avoid the confusion of falsely identifying his concept with Feuerbach's ahistorical category, it should be kept in mind that the content of what Marx

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<sup>5</sup> Marx, *The Economic and Philosophical Manuscripts of 1844*, (International Publishers, New York, 1964.), p. 113.

<sup>6</sup> Alex Steiner, *From Alienation to Revolution: A Defense of Marx's Theory of Alienation*, [http://permanent-revolution.org/essays/alienation\\_revolution.pdf](http://permanent-revolution.org/essays/alienation_revolution.pdf), p. 12.

meant by “production relations” are already implied in his employment of the term “species being”.

There are thus no grounds for citing this change in Marx’s terminology as evidence of a supposed “epistemological break.” At the very least, were North doing an honest examination of my essay on alienation, he should have mentioned my arguments on this topic.

As these prior excerpts from my essay demonstrate, I went to great lengths in my discussion to contrast Marx’s concrete employment of essentialist categories with Feuerbach’s ahistorical abstractions. But all this is passed over in silence by North who manufactures out of whole cloth the charge that I repeat Feuerbach’s errors (which he also claims were shared by Marcuse.) Thus North,

As Marx deepened his critique of Hegelian idealism and the anthropologism of Feuerbach, he ceased to speak of a "human essence" or "essential nature" existing above and outside the historical development of man's social relations of production.

North not only misrepresents my position but garbles Marx’s as well. As I tried to show in my essay, there is no justification for saying that Marx ever, even in his earliest writings, spoke of “human essence” or “essential nature” as something “existing above and outside the historical development of man’s social relations of production.” To make that claim shows that North has bought in completely to the interpretation of an epistemological break between Marx’s writings of 1844 and his later work. It also means that North now sees Marx as having gone through a specific Feuerbachian phase in his development. But this is not how North viewed the matter in 1997, shortly after he read an initial draft of my essay. He wrote at the time:

“By the way, on the question of Feuerbach, I doubt that Marx was ever, in any strict sense, a Feuerbachian. In a discussion that I had with Avner Zis last May (about which I will tell you more when the opportunity arises), Zis stressed that it is only possible to speak of a "Feuerbachian impulse" in the development of Marx. The Stalinists tended to "institutionalize" a specific Feuerbachian stage of Marx's development in order to diminish the overriding influence of Hegel.”<sup>7</sup>

I fully concur with the North of 1997.

## **Marxism and teleology**

North’s cavalier dismissal of teleology and his insistence that Marxism “emphatically rejects teleology” is a fitting companion to his rejection of essentialism and Marx’s theory of alienation and is worthy of a comment. North writes,

Steiner's essay goes so far as to interpret Marxism as an exposition of the teleological unfolding of "man's essential nature." This has nothing whatsoever to do with Marxism, which emphatically rejects teleology.

It’s true that you can find remarks in the works of Marx and Engels against teleology, the most famous being,

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<sup>7</sup> Letter from DN to AS, December 4, 1997.

Darwin's work is most important and suits my purpose in that it provides a basis in natural science for the historical class struggle. One does, of course, have to put up with the clumsy English style of argument. Despite all its shortcomings, it is here that, for the first time, 'teleology' in natural science is not only dealt a mortal blow but its rational meaning is empirically explained.<sup>8</sup>

But perhaps there is more to this quote than is obvious on first reading. We can infer that what Marx had in mind - when he said that "teleology" in natural science "is dealt a mortal blow" - are the kind of explanations that are today championed by the so-called "Intelligent Design" opponents of Darwin. One of the earliest forms of the argument for Intelligent Design was that championed by the 18<sup>th</sup> century theologian William Paley who viewed the regularity found in nature as analogous to the different parts of a watch and concluded that like the watch, the natural world must have had a maker who exhibited a high degree of intelligence in designing it. Paley's argument was dealt a death blow by Darwin when the latter discovered a mechanism - natural selection - that accounts for the evolution of highly complex forms of life as a result of millions of non-directed chance encounters. But note that Marx also makes reference to the "rational meaning" of teleology. What could this mean other than that Marx affirms that whereas arguments from Intelligent Design are illegitimate, there is still a rational core to be found in teleological explanations?

Chris Talbot cites a similar quote from Engels in a recent article on Darwin and as far as he and North are concerned that is the end of the matter.<sup>9</sup> And if we are to consider "teleology" to be the type of explanation offered by Paley - "the different parts of the human eye could not have arisen by chance but exhibit the handiwork of a divine mind" - then of course that would be the end of the matter, the prosecution wins hands down. Teleological explanations of this type are not scientific at all but a substitute for science. They were nicely parodied by Voltaire who had Dr. Pangloss say that "The purpose (ie. teleology) of our nose is to keep our eyeglasses from falling off." Hegel was fond of citing the following amusing example of a misplaced teleological explanation: "the cork tree exists so that we can have bottle stoppers". In fact the shape and composition of the human eye can be explained by purely natural processes and requires no hypothesis of any sort of Divine intervention or ad hoc "purpose". But as the conscientious defense lawyer would say, "Not so fast"! What if there is a deeper meaning to teleological explanations, one that is not so easy to dismiss, and what if we can produce textual evidence that Marx and Engels not only did not dismiss teleological explanations in this other sense, but in fact relied upon them? Perhaps this subject bears further exploration.

If we turn to Hegel, we find an account of the two different meanings of teleological explanation, one that was first articulated by Kant.

"The determination of life by Aristotle already contains this internal purposiveness; hence it stands infinitely far above the concept of modern teleology which had only finite, of external purposiveness in view."<sup>10</sup>

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<sup>8</sup> Marx, letter to LaSalle, 16 January, 1861

<sup>9</sup> Chris Talbot, *Marx and Darwin: Two great revolutionary thinkers of the nineteenth century, Part I*, 17 June, 2009, <http://wsws.org/articles/2009/jun2009/dar1-j17.shtml>

Talbot's article, unlike North's, at least provides us with a definition of teleology as understood by the author. Talbot equates teleology unambiguously with the argument for Intelligent Design. He writes, Teleology, meaning a divine purpose which was working itself out in nature, had been demolished.

<sup>10</sup> G.W.F. Hegel, *The Encyclopaedia Logic*, Paragraph 204: Remark, Addition, Hackett Publishing Co, Indianapolis, 1991.

What Hegel is saying is that Aristotle's account of teleology is too easily dismissed if one interprets it in the sense of an externally imposed "purpose"- the interpretation that was common during the Scientific Revolution. As I explained in my essay on alienation, the true significance of Aristotelian teleology is not so easily dismissed.

For Aristotle, every natural being has a final form, or end toward which it develops, which represents the actualization of its potential. Of course, not all things are genuine natural beings. Some things are mere aggregates, brought together accidentally... But a genuine nature, such as an amoebae to take a simple animal, or a social system to take the most complex of natures, will have a final form toward which it develops. This does not mean that it will "inevitably" fulfill its final form. Contingencies can derail the natural development of an essential nature. A kitten can be hit by a car and fail to grow into the mature cat it has the potential to become, or the working class may be unable to wrest power from the capitalist class in which case the form toward which capitalist society points, socialism, will not be realized.

Furthermore, when a substance has the characteristic of Life, then teleological explanations are not only warranted but are in fact necessary. Once more Hegel has a nice explanation of this:

The members and organs of a living body should not be considered merely as parts of it, for they are what they are only in their unity and are not indifferent to that unity at all. The members and organs become mere "parts" only under the hands of the anatomist; but for that reason he is dealing with corpses rather with living bodies. This is not to say that this kind of dissection should not happen at all, but only that the external and mechanical relationship of whole and parts does not suffice for the cognition of organic life in its truth. The same applies in a much higher degree when the part-whole relationship is applied to spirit and to the configurations of the spiritual world. <sup>11</sup>

It should be borne in mind that the concept of Life is here used in a broader sense than merely biological life. It denotes the specific character of any organism and in that sense includes social life. Hegel also makes clear that teleological explanation does not do away with mechanical explanations. He is not proposing a reversion from the gains made by the Scientific Revolution and a return to Aristotelian science. But by the same token, Hegel insists that when it comes to understanding a living organism, mechanical explanations, though necessary, are not sufficient.

At this point the reader may object, "That is a very interesting footnote in the history of philosophy, but what does it have to do with Marx or with modern science?" Have North and Talbot not convincingly demonstrated that "Marxism has nothing to do with teleology?" The answer is that the discussion of teleology by Hegel has everything to do with the position of Marx and Engels, and as I will try to show, some recent trends in contemporary science.

First off, North and Talbot make their case of Marx and Engels as opponents of teleology by employing the method of selective quotation. They quote Marx's letter to LaSalle, but fail to quote the most extensive discussion of teleology found in the Collected Works of Marx and Engels. This can be found in Engels *Dialectics of Nature*. Here it is:

It is our modern natural scientists' lack of acquaintance with any other philosophy than the most mediocre vulgar philosophy, like that now rampant in the German universities, which

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<sup>11</sup> Ibid. Paragraph 135, Addition.

allows them to use expressions like "mechanical" in this way, without taking into account, or even suspecting, the consequences with which they thereby necessarily burden themselves. The theory of the absolute qualitative identity of matter has its supporters - empirically it is equally impossible to refute it or to prove it. But if one asks these people who want to explain everything "mechanically" whether they are conscious of this consequence and accept the identity of matter, what a variety of answers will be heard!

The most comical part about it is that to make "materialist" equivalent to "mechanical" derives from Hegel, who wanted to throw contempt on materialism by the addition "mechanical." Now the materialism criticised by Hegel - the French materialism of the eighteenth century - was in fact exclusively *mechanical*, and indeed for the very natural reason that at that time physics, chemistry, and biology were still in their infancy, and were very far from being able to offer the basis for a general outlook on nature. Similarly Hæckel takes from Hegel the translation: *causae efficientes*==mechanically acting causes, and *causae finales*==purposively acting causes; where Hegel, therefore, puts mechanical as equivalent to blindly acting, unconsciously acting, and not as equivalent to mechanical in Hæckel's sense of the word. But this whole antithesis is for Hegel himself so much a superseded standpoint that he *does not even mention it* in either of his two accounts of causality in his *Logic* - but only in his *History of Philosophy*, in the place where it comes historically (hence a sheer misunderstanding on Hæckel's part due to superficiality!) and quite incidentally in dealing with teleology (*Logic*, III, II, 3) where he mentions it as the form in which the *old metaphysics* conceived the antagonism of mechanism and teleology, but otherwise treating it as a long superseded standpoint. Hence Hæckel copied incorrectly in his joy at finding a confirmation of his "mechanical" conception and so arrives at the beautiful result that if a particular change is produced in an animal or plant by natural selection it has been effected by a *causa efficiens*, but if the same change arises by *artificial* selection then it has been effected by a *causa finalis*! The breeder as *causa finalis*! Of course a dialectician of Hegel's calibre could not be caught in the vicious circle of the narrow opposition of *causa efficiens*, and *causa finalis*. And for the modern standpoint the whole hopeless rubbish about this opposition is put an end to because we *know* from experience and from theory that both matter and its mode of existence, motion, are uncreatable and are, therefore, their own final cause; while to give the name *effective* causes to the individual causes which momentarily and locally become isolated in the mutual interaction of the motion of the universe, or which are isolated by our reflecting mind, adds absolutely no new determination but only a confusing element. A cause that is not effective is no cause.<sup>12</sup>

This remarkable passage gives the lie to North's contention that Marxism rejects teleology. Engels is here castigating the biologist Ernst Haeckel and other vulgar materialists for identifying materialism with mechanical materialism. He notes that while this may have been justifiable for Hegel and other figures of the 18<sup>th</sup> century and early 19<sup>th</sup> century, there is little justification for this identification in his time, the latter part of the 19<sup>th</sup> century. (There is of course even far less justification for this in the first half of the 21<sup>st</sup> century.) Science has made enormous strides in the past two centuries and the mechanical outlook that seemed to provide an adequate picture of the world in the 18<sup>th</sup> century is today outmoded many times over.

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<sup>12</sup> Frederick Engels, *Dialectics of Nature*, (International Publishers, 1963), p. 321-322.



Engels is further saying that the rigid dichotomy between efficient causation (mechanical explanations) and final causation (teleological explanations) is a remnant of this non-dialectical, mechanical outlook that was embraced in his day by Haeckel. Haeckel saw efficient causes as something occurring in the natural world and counterpoised it to final causes, which he could only conceive as the outcome of subjective purpose – the work of the animal breeder in this case. Engels contrasts Haeckel’s treatment of efficient and final causality with that of Hegel’s supremely dialectical conception of the relationship between them. Hegel recognized that final causality is not merely subjective (what he calls “external”) but immanent in nature and works together with efficient causality, not instead of it or in spite of it.

Vulgar materialism always has a problem with teleology. The issue has come up at various times in the course of the development of Marxism. During the period of the Second International, when a positivist interpretation of Marxism was common, teleological explanations were once more viewed with extreme suspicion. For instance, Plekhanov, the father of Russian Marxism made the following observation:

Modern dialectical materialism has finally eliminated teleology from social science.<sup>13</sup>

Plekhanov’s statement echoes Marx’s letter to LaSalle, except that it lacks any reference to a “rational meaning” behind teleology. The context of Plekhanov’s remark does not bear on teleology understood as an end immanent in nature, or as one writer put it, “... whether parts can be present *for the sake of* a whole, or *because of* an end, without this being due to external intelligent design.”<sup>14</sup>

Rather Plekhanov understood teleology solely as an end external to the nature of the thing itself. He makes this clear in the examples he provides,

It has been shown that men make their history, not so as to march along a predestined road of progress or because they must obey the laws of some kind of abstract (or metaphysical according to Labriola) evolution.<sup>15</sup>

It is certainly true that dialectical materialism does do away with those types of teleological explanations. But this does not speak to the real philosophical issue at hand, namely, are there ends existing immanent to natural beings and can such natural beings only be properly understood when those ends are accounted for in a causal explanation? The philosophical question can be reduced to the following: do natural ends - *Naturzweck* in German – actually exist? Kant, who was the first one to formulate the philosophical problem in this way, maintained that the existence of *Naturzweck* can never be proved but that we are required to conceptualize them as a heuristic device when trying to

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<sup>13</sup> Georgi Plekhanov, “On the Materialist Understanding of History”, *Selected Philosophical Works*, Vol. II, (Progress Publishers, 1976), p. 228.

<sup>14</sup> James Kreines, “The Logic of Life”, *The Cambridge Companion to Hegel and Nineteenth Century Philosophy*, edited by Frederick C. Beiser, (Cambridge University Press, 2008), p. 349, n. 9.

<sup>15</sup> Georgi Plekhanov, “On the Materialist Understanding of History”, *Selected Philosophical Works*, Vol. II, (Progress Publishers, 1976), p. 228.

comprehend living organisms.<sup>16</sup> Hegel, and Engels following him, thought that the existence of *Naturzweck* is real and not merely a heuristic convenience.

Vulgar materialism, as Engels explained in the case of Haeckel, cannot conceive of *Naturzweck* at all and therefore the only legitimate teleological explanation it recognizes is the philosophically uninteresting one of an artificial design. Thus Haeckel deems the animal breeder the final cause of certain forms of animals. Plekhanov was certainly not a vulgar materialist like Haeckel, but he was influenced by the positivist aversion to teleology and thus winds up with a similar position.<sup>17</sup>

The most extensive remarks and the most sweeping rejection of teleology by anyone writing in the Marxist tradition are undoubtedly those of Nikolai Bukharin in his book, *Historical Materialism*. Bukharin was undoubtedly inspired by Plekhanov but treated the subject in far greater detail than the latter's sketchy remarks.

Bukharin's chief argument is that teleological explanations are but a variety of the notorious argument from design and you cannot have a "design" in nature without a "designer". Therefore the philosophical defense of teleology is but a hidden expression of belief in God. Here is how he put it:

If we consider teleology as a general principle, *i.e.*, if we closely examine this view, according to which everything in the world is subject to certain purposes, it will not be difficult to grasp its complete absurdity. After all, what is a goal? The conception of a goal presupposes the conception of some one who sets this goal as a *goal, i.e.*, who sets it *consciously*. There is no such thing as a purpose apart from him who conceives the purpose...The advocates of teleology are similar to [a] savage, for in their minds the entire world has a purpose, this purpose having been set by some unknown being. It is clear from the above that the *conception of purpose, of planfulness, etc., is absolutely inapplicable to the world as a whole, and that the natural law of phenomena is not a teleological natural law.*<sup>18</sup>

Bukharin is mistaken on a number of levels. First of all, he misunderstands what the teleological argument says. He confuses "ends" (as in the Greek *telos*) with "purpose". But even more to the point, he begs the question as to the existence of *Naturzweck*. He assumes from the beginning the impossibility of *Naturzweck* and then argues backwards by ascribing to those who affirm their existence a belief in a supernatural being, when ends are in nature, or a purposeful designer, when "ends" are those set by a conscious human agent. This dismissal of the possibility of *Naturzweck* links Bukharin's argument to the thesis of Haeckel that was the object of Engels's scorn – that the animal breeder is the final cause of certain forms of animals.

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<sup>16</sup> Kant's argument is found in his *Critique of Judgment* and forms the basis of his understanding of aesthetic judgments.

<sup>17</sup> To be fair to Plekhanov, Engels's unpublished notes on the *Dialectics of Nature* were unknown to him. One can only speculate as to his reaction had he known of Engels's work in this area.

<sup>18</sup> Nicolai Bukharin, *Historical Materialism*,  
<http://www.marxists.org/archive/bukharin/works/1921/histmat/1.htm#c>

The Italian Marxist, Antonio Gramsci, writing from a fascist prison, composed a devastating critique of Bukharin's book, *Historical Materialism*, which he viewed as a poor attempt at a popularization of Marxist philosophy that was hopelessly compromised by Bukharin's vulgar materialism and his failure to assimilate dialectics. Gramsci, who knew a thing or two about philosophy, writes the following when commenting specifically on Bukharin's treatment of teleology,

Thus the Manual [Bukharin's book on Historical Materialism] presents the question of teleology in its most infantile manifestations, while ignoring the solution to the problem offered by Kant.

Amplifying on this remark in a footnote, Gramsci quotes the philosopher Croce,

"In opposition to extrinsic finalism, generally accepted in the eighteenth century and recently criticized by Kant, who had replaced it with a more profound conception of finality."

In concluding his remarks on teleology, Gramsci writes,

Might one not trace to a teleological root the expression "historic mission"? In many cases this expression has acquired an equivocal and mystical meaning. But in other cases it does have a meaning, which, in the light of the Kantian conception of teleology, could be maintained and justified by the philosophy of praxis [ ie. Marxism ] .<sup>19</sup>

Gramsci's observation hits the proverbial nail on the head. If the invocation of the "historic mission" of the working class is to be anything more than a rhetorical flourish bandied about for holiday speechifying then how is it to be understood? Clearly the "historic mission" of the working class, the transformation of existing social relations into the society of associated producers, is an objective necessity. But that does not mean that it is a preordained outcome or somehow "inevitable". Rather the "historic mission" of the working class must be understood as a movement to the *Naturzweck* of what Marx called the prehistory of man. The *telos* of class society is objectively there, but its

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<sup>19</sup> Antonio Gramsci, *Selections from the Prison Notebooks*, (International Publishers, 1971), p. 470-471.

In one of those tragic ironies of history, Bukharin himself became a prisoner of Stalin's KGB in the Lubyanka shortly after Gramsci wrote his critique. During this period, Bukharin wrote a number of books, the most important of which are a series of reflections on philosophy published recently with the title *Philosophical Arabesques*. Bukharin revisits the subject of teleology in this work. Although his later reflections show a great deal more nuance than his earlier works, he still does not get beyond conceiving teleology as a matter of "purpose". His discussion here does have the merit at least of directly confronting Hegel's notion of the distinction between external and immanent teleology. However, Bukharin considers the distinction a false one and thinks that all teleological explanations are ultimately of the same character as the one that states that the cork oak exists so that we can have bottle stoppers. He writes, "Immanent" teleology reveals its immanent nature and defines its essence, namely, the fact that it is merely a refined variant of vulgar teleology..." Nikolai Bukharin, *Philosophical Arabesques*, (Monthly Review Press, 2005), p. 183.

Gramsci's critique, that Bukharin misses the genuine philosophical issue in the discussion of teleology, is still applicable.

realization requires a high degree of consciousness expressed in the practice of the class struggle.

Anyone taking the trouble to carefully examine Marx's work, and not just his early work, cannot help but be struck by the "teleological" type statements to be found there. For instance, take the following quote from the *Grundrisse*,

Yet it is obvious that this process of inversion [of living labour being dominated by alienated labour] is merely an historical necessity for the development of the productive forces from a definite historical point of departure, or basis. In no way is it an absolute necessity of production; it is, rather, a transitory one, **and the result and (immanent) aim of this process is to transcend this basis itself and this form of the process.** [my emphasis A.S.]<sup>20</sup>

As I pointed out in my essay on alienation, empiricist-minded opponents of teleology such as Alex Callinicos cannot bring themselves to admit that Marx saw things teleologically. They try to confine the "teleological" Marx to the early writings of the *1844 Manuscripts*.<sup>21</sup> When confronted with the more mature writings of the late 1850's their rejoinder is that Marx's employment of teleological language is just a *façon de parler*. But this interpretation is hardly tenable. For one thing, it would require a violent separation of the mature Marx from Hegel. That was precisely the project undertaken by Althusser, Colletti, Elster and others in a previous generation, with very negative consequences for an understanding of Marx.

Unfortunately, most commentators writing from a broadly interpreted Marxist tradition have followed in the footsteps of Plekhanov and Bukharin rather than Engels and Gramsci when commenting on teleology. The most recent example of this trend comes from an otherwise serviceable book, *Critique of Intelligent Design: Materialism versus Creationism From Antiquity to the Present*. This book includes a section titled "The Death of Teleology" where teleology is presented as being equivalent to the argument for Intelligent Design. The authors write that Marx and Engels's 1846 work, *The German Ideology*, argued that,

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<sup>20</sup> Marx, Engels, *Collected Works, Volume 29, Economic Manuscripts of 1857-1858*, (Progress Publishers, 1987), p. 210.

It is ironic that North quotes another section of the *Grundrisse* about alienation, and the only thing he seems to get out of it is that alienation, according to Marx, "is the outcome of an historically-determined social process." As a matter of fact, the section North quotes has to do both with alienation and the historical necessity for the overcoming of alienation and is a dramatic vindication of the fact that Marx was not only the theoretician of capitalism, but also the theoretician of socialism. When Marx says that, "The degree and the universality of the development of wealth where *this* individuality becomes possible presupposes production on the basis of exchange values as a prior condition..." he is explaining that capitalist society is both a necessary moment and makes possible its own transcendence, paving the way for the society of associated producers. That North can only take away from this remarkable passage the pedestrian observation that "alienation is historically determined" is roughly equivalent to someone who, having read Homer's *Odyssey*, says that it is about a trip from Troy to Ithaca. The statement is itself not false, but it misses everything of value in that work.

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See my discussion of Callinicos and Ellen M. Woods in *Alienation and Revolution*, [http://permanent-revolution.org/essays/alienation\\_revolution.pdf](http://permanent-revolution.org/essays/alienation_revolution.pdf) p. 30-31.

...organic existence could not be understood in teleological terms, but involved “the bitterest competition among plants and animals” in which the relation of species to natural conditions was the material cause.<sup>22</sup>

Following what is by now a well-established tradition, the book cites Marx’s letter to LaSalle while Engel’s remarks on final causation as well as Gramsci’s critique of Bukharin are ignored. And unlike Bukharin, the book makes no reference to Hegel’s discussion of “immanent teleology”. Perhaps this is excusable as this work is meant to be a popular presentation of materialism and makes no pretense at a comprehensive treatment of the subjects it covers. But the net effect of this book is exactly the same as the net effect of Bukharin’s popular presentation of Historical Materialism in the 1920’s – it reinforces a positivist and anti-dialectical interpretation of Marxism. Gramsci’s critique of Bukharin’s book could easily be applied to this contemporary attempt at a popular presentation:

The Manual [i.e. Bukharin’s *Historical Materialism*] contains no treatment of any kind of the dialectic. The dialectic is presupposed, in a very superficial manner, but is not expounded, and this is absurd in a manual which ought to contain the essential elements of the doctrine under discussion and whose bibliographical references should be aimed at stimulating study...

[The author] really does capitulate before common sense and vulgar thought, since he has not put the problem in exact theoretical terms and is therefore in practice disarmed and impotent. The uneducated and crude environment has dominated the educator and vulgar common sense has imposed itself on science rather than the other way around. If the environment is the educator, it too must be educated, but the Manual does not understand this revolutionary dialectic.<sup>23</sup>

It is no small irony that the mantra against teleology is repeated by commentators on Marxist philosophy at the same time as teleological explanations are finding growing support in the natural sciences. It is well known for instance that some of the leading theorists in evolutionary biology and ecological science have insisted on the applicability of teleological explanations in those disciplines. As is to be expected, this is an area of the philosophy of science that is full of controversy. Much of the discussion in recent years has centered on the precise significance of teleological explanations and their range of applicability. Advocates of a “weak” form of teleology, whereby an “end” is synonymous with a “function” have advocated a new label for such arguments – “teleonomy”, to distinguish them from the discredited argument from design which is still associated with the term “teleology”.<sup>24</sup>

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<sup>22</sup> John Bellamy Foster, Brett Clark, Richard York, *Critique of Intelligent Design: Materialism versus Creationism from Antiquity to the Present*, (Monthly Review Press, 2008), p. 101.

<sup>23</sup> Gramsci, op.cit. p. 434, 435.

<sup>24</sup> The online Wikipedia provides the following definition of teleonomy:

**Teleonomy** is the quality of apparent purposefulness and of goal-directedness of structures and functions in living organisms that derive from their evolutionary history and adaptation for reproductive success.

One can counter that if the term “agnosticism” is a form of “shamefaced atheism”, then “teleonomy” is a form of “shamefaced teleology”. This was nicely expressed in a joke told by the historian of science, David Hull,

Haldane [in the 1930s] can be found remarking, ‘Teleology is like a mistress to a biologist: he cannot live without her but he’s unwilling to be seen with her in public.’ Today the mistress has become a lawfully wedded wife. Biologists no longer feel obligated to apologize for their use of teleological language; they flaunt it. The only concession which they make to its disreputable past is to rename it ‘teleonomy’.<sup>25</sup>

Nor is the application of teleological explanations in contemporary science limited to biology. In recent years a great deal has been written about “self-organizing structures” whereby teleological explanations may be seen to apply to areas of science as diverse as chemistry and cosmology. It is beyond the scope of this piece to explore this material other than to mention it. This material remains highly speculative and highly controversial. But one thing is clear – the question of teleology has reemerged as a vital issue in philosophy and in the natural sciences of the 21<sup>st</sup> century after seemingly being buried by the mechanists of the 18<sup>th</sup> century and the positivists of the 19<sup>th</sup> and 20<sup>th</sup> century.

The ignorant protestations of David North and Chris Talbot notwithstanding, the Marxian dialectic remains alive and well and offers the best methodological instruments available for the understanding of a science that has gone beyond its mechanistic roots.

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<sup>25</sup> Hull, D.L., “Philosophy and Biology”, in G. Fløistad, ed., *Contemporary Philosophy, A New Survey*, vol. 2: *Philosophy of Science*, pp. 280-316 Nijhoff, 1982.

## **Part 2: Science at the Crossroads**

Still another point of contention in the philosophy of science is how we view its history. The positivists see science as an ahistorical search for truth and deny the sociological and historical dimension of science altogether. Their polar opposites are the radical social-constructionists. The latter see the history of science as the history of the social or cultural or economic background in which scientists are embedded. In the literature of the historiography of science the view of science as a search for truth in which scientific concepts are progressively refined to bring them close to objective reality is known as the internalist school. Their counterparts who see scientific activity as completely explained by historical circumstances are known as the externalist school.<sup>26</sup>

It is clear that a Marxist understanding of the history of science must accommodate an external approach. Social classes and the productive forces do matter. That is certainly one of the fundamental principles of historical materialism. But it is just as clear that if the objective nature of scientific laws is to be defended, then the external approach cannot exhaust the subject of the history of science. Room must be made for an internal explanation as well. A full account of the history of science requires both an external and an internal approach.

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<sup>26</sup> In my correspondence with Chris Talbot, I noted that not all versions of an externalist explanation, otherwise known as social constructivism, require that we adopt a relativist position in relation to the status of scientific knowledge:

These positions have recently been the subject of debate in the philosophy of science. I am referring to the “strong” programme in the sociology of knowledge (identified with the work of David Bloor) as opposed to the “weak” programme (identified with Robert Merton). The strong programme does indeed imply that all scientific knowledge is ultimately just a cultural artifice. It has no objective standing on its own. The weak programme in the sociology of knowledge on the other hand states that the scientific enterprise is always historically and socially embedded, but its products are ultimately objective truths about the state of the world. Both the strong and weak programmes of the sociology of knowledge oppose positivism, which does not recognize the historical dimension of the scientific enterprise at all. But that is where the similarity ends. The strong programme advocates a radical historicism that denies the objective nature of reality. The postmodernists are but one expression of the most radical currents within this stream. The weak programme on the other hand is concerned with such issues as the historical background that made it possible to formulate Newton’s laws of motion in the 17<sup>th</sup> century and why this was not possible at the time of Democritus. It concerns itself with investigating the historical conditions that made possible a particular line of inquiry. It does not presume however to attempt any connection between the historical genesis of particular scientific theories and their validity. The latter is precisely what the strong programme does attempt. That is what opens the door to such strange creatures as “feminist physics” and the derision of mainstream science as “totalitarian”. The weak programme in the sociology of knowledge is however completely consistent with a Marxist understanding of the development of science. The Marxist view of the scientific enterprise is clearly opposed to both the positivist approach and the cultural relativism of the strong programme in the sociology of knowledge. ([http://permanent-revolution.org/polemics/talbot\\_steiner\\_exchange.pdf](http://permanent-revolution.org/polemics/talbot_steiner_exchange.pdf) Steiner Reply #9)

The Talbots loudly proclaim their adherence to an externalist approach in their polemic, introducing it with a discussion of a landmark event in the historiography of the history of science, the 1931 conference in London that was later documented in the book, *Science at the Crossroads*. Here is the passage:

History has its own history, and by relying on Yates and Dobbs, Steiner is taking a position in a long-running polemic that can be traced back to 1931 and the Second International Congress of the History of Science and Technology in London. At that conference, the Soviet historian of science Boris Hessen gave a paper in which he set out for the first time a historical materialist analysis of Newton's life and work, including his alchemy and religious ideas. In an article written in 2000, Ann Talbot explained:

Hessen showed that Newton's scientific work had a material basis in the technological developments and economic imperatives of the time. He established what he called the "earthy core" of Newton's *Principia* that underlay its abstract mathematical form.

Hessen's lecture was a seminal influence on many of the historians and scientists present, inspiring them to set the history of science in its wider social context rather than considering its development as though it had taken place in a vacuum. For others, Hessen's paper, whether acknowledged or not, became the target of their attempts to deny that Newton had any connection with economics or technology.

Leaving aside the specious charge that I “rely” on the work of Yates and Dobbs, the Talbots introduce a valid point for the sole purpose of creating another straw man argument against me. They are certainly justified in calling attention to the importance of this conference and specifically of Hessen’s contribution in launching what was then a brand new discipline, the external or historical approach to the history of science. Hessen is rightly credited with inspiring Marxist historians of science such as J.B.S. Haldane and Benjamin Farrington. The Talbots introduce their discussion of Hessen in order to blast me as one of those who ignore externalist explanations, trying to link me to those who see science “as though it had taken place in vacuum.” This issue had already come up in my exchange with Chris Talbot. In his criticism of my lecture on science, he noted that

... it is surely not permissible for a Marxist to ignore questions of historical materialism, the role of productive forces, the class struggle, politics and so on. Here I think that the approach you take to the history and development of science are misleading. I mean in talking about the “philosophical heritage spawned by Newton” in which you include Locke, Hume, the French materialists, the positivists of the 19<sup>th</sup> century, the logical atomism of Russell and Whitehead, the early Wittgenstein, and the later turn to language analysis, and even, in the following paragraph, Thomas Hobbes.<sup>27</sup>

In their contribution to North’s smear campaign, the Talbots reiterate this charge with a vengeance:

Steiner is entirely blind to the manifold interconnections of social thought that produce a new development in physics or any other area of human endeavour.

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<sup>27</sup> [http://permanent-revolution.org/polemics/talbot\\_steiner\\_exchange.pdf](http://permanent-revolution.org/polemics/talbot_steiner_exchange.pdf) Talbot Comment #11



In this connection, the Talbots are just repeating the same charge that was already launched by North in his *Odyssey* piece, where he said,

...it is especially notable that Steiner, in his discussion of the origins of modern science, ignored Engels' insistence that the decisive factor in the development of science in the 16th and 17th centuries was not the free development of thought—to say nothing of its more mystical and occult forms—but rather the growth of the forces of production.<sup>28</sup>

While it is a truism among Marxists that a comprehensive explanation of the history of science must consider the role of the productive forces, politics and much else, it certainly does not follow that every single lecture dealing with the history of science must concentrate on this aspect of the material. As a matter of fact, I did not ignore the historical background, but it is true that I did not concentrate on it in my lecture. I explained in my reply to Chris Talbot that due to the time constraints imposed by a one hour lecture I decided to concentrate on the scientific concepts themselves while providing a very brief review of the historical background. In response to Talbot, I wrote,

I could have gone into much greater depth in discussing the historical basis behind the emergence of the 17<sup>th</sup> century revolution in science. But neither did I ignore it. Some practical choices are unavoidable in preparing material for a popular lecture. In discussing a topic as vast as the 17<sup>th</sup> century revolution in science as well as the 20<sup>th</sup> century revolution, certain decisions had to be made as to what gets highlighted within the scope of a one hour lecture. Given these constraints, I made the decision to focus on the content of the ideas of Newton, Hobbes, and the others and provided only the barest sketch of a historical background. That is perhaps unfortunate, but I do not see how it could have been avoided without consigning the discussion of the philosophical ideas to the most superficial of treatments.<sup>29</sup>

Whereas on other occasions North and the Talbots defend the objectivity of scientific theories, when it comes to scoring points against me, they conveniently forget about the validity of internalist explanations in their zeal to paint me as an opponent of historical materialism. Thus, the false “materialism” in the history of science that they adopt, portraying themselves as embracing the “earthy core” of science, actually leads them unwittingly to positions closely aligned with the radical social constructivists and postmodernists. For if scientific concepts are reduced solely to their socio-historical function, we have then abandoned any conception of objective truth. We have entered the territory of judging scientific concepts not by their ability to objectively explain the natural world, but whether they serve the interests of the progressive social forces in

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<sup>28</sup> The incredible hypocrisy behind North's enlistment of Engels against me can be gauged by the fact that North cites Engels no less than 18 times – not including references in footnotes or quotes from others – but not a single one of these references bears on the work of Engels that was a central topic of my lecture on science, his *Dialectics of Nature*. The great majority of North's references to Engels are related to the statement Engels made about the centrality of the materialism/idealism question in the history of philosophy. This exercise in beating a dead horse cannot hide the fact that neither North nor the Talbots have written a single word in the past 25 years about the seminal text of Marxism in the philosophy of science whereas Engels' *Dialectics of Nature* has been at the center of much of my theoretical work.

<sup>29</sup> [http://permanent-revolution.org/polemics/talbot\\_steiner\\_exchange.pdf](http://permanent-revolution.org/polemics/talbot_steiner_exchange.pdf) Steiner Reply #11

history or not. That is to say, science becomes on this account a “dominant narrative” that reflects existing relations of power and nothing more. It is the kind of explanation Foucault would have endorsed. Whereas North and the Talbots would undoubtedly reject such conclusions explicitly, their un-dialectical approach makes it impossible for them to consistently defend the objectivity of the scientific enterprise.

Were this just a matter of the Talbots’ focusing on externalist explanations solely in order to brand me as an idealist in the history of science it would be bad enough, signifying that they are polemicizing in bad faith. That is true enough, but even worse, the Talbots are genuinely unable to bring together externalist and internalist explanations in the history of science because they reject a dialectical approach in the sciences. Or to put it another way, the dialectical unity between internalist and externalist explanations is another form of *the problem of how to reconcile the objectivity of scientific concepts with the logic of discovery of those concepts*. So far removed from Marxist philosophy have the Talbots (and North) become, that they aren’t even aware of this as a problem. Instead they flit back and forth between two poles, sometimes defending a version of science as an ahistorical search for truth in the manner of the positivists and sometimes defending science as a purely sociological and historical enterprise, a standpoint that brings them close to the postmodernists whom they despise. Hegel nicely characterized this type of movement back and forth between the two poles of a contradictory unity that cannot be brought together in his discussion on the faculty of perception in the *Phenomenology*:

The sophistry of perception seeks to save these moments from their contradiction, and it seeks to lay hold on the truth, by distinguishing between the *aspects*, by sticking to the ‘Also’ and to the ‘in so far’, and finally by distinguishing between the ‘unessential’ aspect from an ‘essence’ which is opposed to it. But these expedients, instead of warding off deception in the process of apprehension, prove themselves on the contrary to be quite empty...<sup>30</sup>

The quote from Hegel highlights the knots one gets into in trying to account for the different sides of a contradictory unity while abjuring dialectical thinking. This is the same issue that was highlighted by Lenin in his ruminations on Hegel. In the fragment included in his *Philosophical Notebooks* (Volume 38 of Lenin’s *Collected Works*), *On the Question of Dialectics*, Lenin noted that in order to bring together a relative moment – in our case in the history of science - with the objective validity of science, it is necessary to grasp the absolute within the relative:

The distinction between subjectivism (scepticism, sophistry, etc.) and dialectics, incidentally, is that in (objective) dialectics the difference between the relative and the absolute is itself relative. For objective dialectics there *is* an absolute *within* the relative. For subjectivism and sophistry the relative is only relative and excludes the absolute.<sup>31</sup>

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<sup>30</sup> G. W. F. Hegel, *Phenomenology of Spirit*, translated by A. V. Miller, (Oxford University Press, 1977), p. 77.

<sup>31</sup> V. I. Lenin, *Collected Works*, Volume 38, (Progress Publishers, 1976), pp. 357-361. The online version is available at <http://www.marxists.org/archive/lenin/works/1914/cons-logic/summary.htm>

At one time the International Committee laid stress on training its members in dialectics and turned to works such as the essay by Lenin from which I quoted. But after decades of neglect of dialectics, the Talbots and North are incapable of providing a coherent account of the scientific enterprise: instead they serve up a hodge-podge of superficially ‘orthodox’ statements about its history along with positivist ‘common sense’ about its content. Their “sophistry”, to borrow Lenin’s term, lies in their use of Marxist phrases to rationalize *their rejection of dialectics as central to the Marxist conception of science*.

The discussion of *Science at the Crossroads* would not be complete without pointing out that the Talbots’ interpretation of Boris Hessen’s speech at the historic conference is out of touch with recent scholarship (and by “recent” I mean scholarship that is now almost 25 years old.) The Talbots’ depiction of this event may have been the conventional wisdom three decades ago, but that view has been superseded with a far more nuanced understanding of what Hessen was up to. They wax enthusiastically about Hessen’s disclosure of the “earthy core” of Newton’s thought, pointing out in particular Hessen’s stress on Newton’s close affinity with the demands of technological innovation. While today Hessen’s pioneering efforts at providing an externalist explanation of scientific discoveries are almost universally acknowledged<sup>32</sup>, he has also been criticized for the narrow focus of his explanation in terms of technology as well as their reductive implications. As a matter of fact, the charges of reductionism were not justified. Whereas Hessen did present a case for the technological impetus of scientific discoveries in the 17<sup>th</sup> century, he was careful later on to qualify this thesis. He wrote:

It would, however, be a gross oversimplification to derive *every problem* studied by various physicists, and *every task* they solved, directly from economics and technology. According to the materialistic conception of history, the final determining factor in the historical process is the production and reproduction of actual life. But this does not mean that the economic factor is the *sole* determining factor. Marx and Engels severely criticised Barth precisely for such a primitive understanding of historical materialism.

The economic situation is the basis. But the development of theories and the individual work of a scientist are also affected by various superstructures, such as political forms of the class struggle and its results, the reflection of these battles in the minds of the participants—in political, juridical, and philosophical theories, religious beliefs and their subsequent development into dogmatic systems.

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<sup>32</sup> One such acknowledgement of the importance of Hessen’s speech – there are many others - is expressed by the historian of science Loren Graham,

Hessen may not have created externalism, but he will be forever considered one of its founders. His effort to explain Newtonian physics in terms of the social, political and economic context of seventeenth-century England, notwithstanding the fact that it appears inadequate to contemporary Newton scholars, was a truly pioneering work.

Loren Graham, *The Socio-Political Roots of Boris Hessen: Soviet Marxism and the History of Science*, Social Studies of Science (SAGE, London, Beverly Hills and New Delhi), Vol. 15 (1985), p. 706.

Therefore, when analysing the subjects addressed by physics we took the central, cardinal problems that attracted the greatest attention of scientists in that period. But the foregoing general analysis of the economic problems of the period is inadequate for understanding how Newton's work proceeded and developed and for explaining all the features of his work in physics and philosophy. We must analyse more fully Newton's period, the class struggle during the English Revolution, and the political, philosophical and religious theories as reflections of that struggle in the minds of the contemporaries.<sup>33</sup>

A careful reading of what Hessen actually presented at the London Congress in 1931 should have scotched the accusations of technological determinism and reductionism. Nonetheless, Hessen has not escaped the charge of being a vulgar economic determinist from those predisposed to treat any historical explanation that points back to an economic foundation as "vulgar".<sup>34</sup> Such charges of "vulgarization" presuppose a vulgar understanding of the Marxist method. It is to take literally such epigrams from Marx as:

The windmill gives you society with the feudal lord: the steam-mill, society with the industrial capitalist. (*The Poverty of Philosophy*, 1847)

Many vulgar Marxists as well as opponents of Marxism have taken that statement and similar ones literally and have as a result convinced themselves that Marxism endorses technological determinism. But that is to misconstrue the intent of such statements. Marx's epigram contains a brilliant insight but it was never meant to be a simple formula to be applied in any and all circumstances. Rather, it has the character of outlining a research project that in the hands of a careful historian can show the connections between the property relations at work in a society and the level of development of the productive forces. Marx never suggested that the relationship is direct and not mediated through many layers of social and cultural entities each of which has its own dynamic.

Furthermore, while Marxists insist on analyzing the historical background behind the development of ideas, both scientific and cultural, that historical background cannot be identified solely with the technological requirements of the ruling class. To do so

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<sup>33</sup> Hessen's essay was originally published in the book *Science at the Crossroads*. There is an online version available with a superior translation at:

[http://webfiles.mpiwg-berlin.mpg.de/rereadingClassics/Hessen.pdf/V1\\_Hessen.pdf](http://webfiles.mpiwg-berlin.mpg.de/rereadingClassics/Hessen.pdf/V1_Hessen.pdf)

<sup>34</sup> The otherwise informative historian of science, H. Floris Cohen, wrote the following bit of poorly informed vitriol against Hessen, and by implication, the Marxist approach to the history of science, which he equates with vulgar Stalinist reductionism:

In order to begin to overcome the virtually inborn prejudice, coming so naturally to the practicing scientist, of science being a wholly autonomous product of the inquiring intellect, nothing would have been needed so much as patience, subtle discrimination, and the careful avoidance of crude reductionism. Instead, here was this narrow-minded piece of bigoted dogmatism at its Stalinist crudest. What could anybody who was not already looking toward the Soviet Union as the Promised Land do but reject the message, hook, line and sinker?

H. Floris Cohen, *The Scientific Revolution: A Historiographical Inquiry*, (University of Chicago Press, 1994), p. 332.

involves a double vulgarization of Marx – first it implies that the development of the productive forces is nothing more than the development of technology. But the development of the productive forces for Marx while encompassing the development of technology, could never simply be equated with them. It also includes the restructuring of the social relations of production. Secondly, the technological imperative, while certainly important, cannot eclipse other mediating elements in the larger culture such as philosophy, and even religion.

Thanks to the work of Loren Graham, a respected specialist in the history of Soviet science, we have come to understand that Hessen's actual position on the relationship of history to science was very different than the picture depicted by those emphasizing the 'earthy core' theme. According to Graham, Hessen's intervention at the Congress in 1931 cannot be properly understood outside of the context of the political situation in Moscow at the time. In effect, Graham is saying that the historiography of the history of science has its own history and it is not possible to properly understand the historiography of the history of science without taking into account that history as well. Thus when the Talbots say that "history has its own history" and fail to take account of the historical context behind Hessen's 1931 paper, they are ignoring their own principle.

The Talbots do not consider the history of Hessen's intervention. They take at face value the externalist thesis provided by Hessen and identify that uncritically with the Marxist method in the philosophy of science. Graham, in his essay, points to a serious problem with that procedure. He introduces the issue thus:

I wish to point to an almost totally neglected dimension of the 'Hessen Episode'- namely, the social, political and economic context in the Soviet Union out of which Boris Hessen's paper arose. In other words, I wish to make an attempt at doing for Boris Hessen what Boris Hessen tried to do for Isaac Newton-that is, to show how his most important work was rooted in politics and economics. My conclusion is that Hessen's paper is better understood as a result of his peculiar and threatened situation in the Soviet Union than as a model of Marxist analysis of science, either vulgar or sophisticated.<sup>35</sup>

Graham then proceeds to ask a prescient question:

It is extremely ironic that radical historians of science who castigated old-fashioned historians of science for looking upon Newton's physics as if it had 'dropped from the sky' (borrowing a phrase from Engels) accepted Hessen's paper exactly as if it had dropped from the Moscow sky. With the fortunate exceptions of David Joravsky and Gary Werskey, Western historians of science have not asked of Hessen the questions they were beginning to ask of Newton-namely, 'How did his work reflect the constraints and impulses of its specific social environment?'<sup>36</sup>

Graham's essay notes that while Hessen presented what appeared to be a strictly orthodox "materialist" and historical explanation of Newton, his writings previous to this conference were anything but orthodox:

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<sup>35</sup> Graham, *ibid.* 706

<sup>36</sup> Graham, *ibid.* p.706-707

The first striking fact is that Hessen's performance in London in 1931 was decidedly atypical of what he had been doing in the Soviet Union. There he did not produce articles about the social context of science, but instead was engaged in a spirited defence of relativity theory and quantum mechanics against vulgar Marxist critiques of these revolutionary developments in physics. In these articles he maintained that a separation could be made between the intellectual content of a theory and the social context in which it was produced, a view that sounds very similar to the one which the more outspoken external historians of science in the West, citing his work, would eventually question. And another striking feature of Hessen's life in the Soviet Union at this time is that he was having political difficulties: he was a sophisticated Marxist intellectual of the type that had flourished in the immediate post-revolutionary period, but now he was being threatened by a new generation of dogmatists arising under the tutelage and protection of Stalin. Hessen was fighting a rearguard action against this threat, but eventually he would lose. A few years after returning from the London congress he was arrested, and he died in prison in 1938. In fact, all but two of the members of the eight-man Soviet delegation to London similarly perished, including Nikolai Bukharin and the famous geneticist Nikolai Vavilov, foe of Stalin's pseudo-geneticist Trofim Lysenko.<sup>37</sup>

Graham points out that the campaign against relativity theory and quantum mechanics in the late 1920's and early 1930's by the Stalinist science apparatus singled out scientists like Hessen who consistently defended the autonomy and integrity of science against ideologically motivated attacks:

Sophisticated Marxists like Boris Hessen, knowledgeable both in politics and in physics, saw the intellectual poverty of the attacks on modern physics by their Soviet colleagues. Hessen went to the front line in this battle, simultaneously defending Marxism and modern physics. Writing in 1927 he insisted that just because it was possible on the basis of relativity theory and quantum mechanics to draw conclusions that were unacceptable to Marxists, it was no reason for 'throwing out the physical contents of the theories'. If Soviet Marxists condemned relativity theory as anti-Marxist then what would they do, asked Hessen, if relativity turns out to be correct as a physical theory? The only way to avoid the conclusion that Marxism was in error, he continued, was to see the difference between the physical core of science and its philosophical interpretation, a theme to which he would return in his famous paper on Newton.<sup>38</sup>

In his 1931 essay on Newton, Hessen spends several pages explaining that Newton's adoption of the notion of absolute space as basically a "container" for matter led inevitably to the postulation of a deity who had to start motion in the first place. Motion for Newton was not understood as intrinsic to matter<sup>39</sup> and this was traced by Hessen back to the compromise of those social forces Newton represented within the English Revolution of the 17<sup>th</sup> century who wanted to consolidate whatever gains had been made in an earlier period without opening the door to more radical forces.

<sup>37</sup> Graham, *ibid.* p.707-708

<sup>38</sup> Graham, *ibid.* p. 710-711

<sup>39</sup> It was one of the brilliant insights of Engels to present the inextricable link between matter and motion in his *Dialectics of Nature*.

Thus, according to Hessen, the fact that Newton represented a tendency within the bourgeoisie that compromised with the most advanced forms of materialism – an ideological problem – should not detract from the objective validity of his scientific work. Although there is no direct reference to the then current ideological battles over relativity theory in Hessen’s paper, the analogy between Hessen’s treatment of the philosophical battles in Newton’s time to what he would have said (as well as what he had previously written) about the current ideological battles over relativity theory should also be clear: i.e. the ideological problems with Einstein and some of his followers should not detract from the objective validity of the theory of relativity. This discussion also underlines another aspect of Hessen’s paper – that the externalist explanation it presents for the understanding of Newton was never meant by Hessen to stand on its own but needed to be complemented with an internalist explanation of why Newton’s physics was superior to the theories it replaced. The historian of Soviet science, Helena Sheehan, reflecting on Hessen’s London paper as informed through Graham’s pioneering work, summed up the significance of this episode:

Although he emphasized socio-economic roots in London and cognitive credibility in Moscow, most provocatively in both contexts, against conflicting pressures, his position was a consistent one, demonstrating a dialectical synthesis of internal and external factors, of empirical evidence, logical argument and socio-economic context. Hessen was not an externalist.<sup>40</sup>

It is this *dialectical synthesis of the internal and external* that the Talbots miss. This is the subtext behind the Talbots’ one-dimensional stress on the “earthy core” theme of Hessen’s talk, to the exclusion of his defense of the autonomy of scientific concepts that was so ably revealed by Graham’s 1985 essay.

To be continued.

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<sup>40</sup> Helena Sheehan, *Marxism and science studies: A sweep through the decades*, [http://doras.dcu.ie/508/2/marxism\\_science\\_2007.doc](http://doras.dcu.ie/508/2/marxism_science_2007.doc)