

Dialectical Materialism and Science

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Introduction

Science, as the typical, objective form of knowledge, has often been criticized by philosophers. Heidegger says that science ignores the origin from which it developed and attempts to force its application to reality.

The notion of “*theoria*” in its original Greek sense of a neutral, detached, impartial observation seems desirable. Heidegger points out that the would-be theoretician arises from another mode of understanding, but the theoretician denies this fact. He views modern science as the result of developments that have been made since ancient Greece and criticizes the one-dimensionality of modern science. He rejects the non-temporal viewpoint or the viewpoint of nowhere found in traditional metaphysics and stands behind the finiteness and historical nature of the human-being.

Human beings are historical. The phrase “the essence of *Dasein* lies in its existence” means that our lives do not express some pre-given, timeless human quality. We are the nexus of the practices, assumptions, prejudices, habits, and traditions that make up the everyday experiences and actions in which we find ourselves. However, the world in which we live is not static. Its basic attitudes and assumptions can change. This is expressed by Heidegger as “deep history.”

Marx characterizes his method as scientific but at the same time, he enthusiastically studied human history. Marxism identifies with the science of history. In this article, I would like to clarify how Marx can implement the historical study of humans with the scientific method.

First, I will compare Marx's thoughts on the relationship between thought and the real world with that of Engels. Engels did not understand Marx's monistic theory of dialectical materialism and fabricated a dualistic theory of Marxism (Cf. Omote 2014). The comparison will clarify the viewpoint from a scientific study on the relationship between theory and

the real world. I will then address examples from the history of natural science to support this viewpoint.

Chapter 1 The Reality of Theory According to Marx

Section 1 Distinctions Between Theory and Thought

Theory is the thinking that practically grasps the objective world; it is the result of such thinking; and inevitably, it is how this thinking is integrated with practice. On the other hand, thought is the interpretation of the images of thinkers in the world. Indeed, thought also originates from practice but this practice refers to the small lives of these thinkers and their images are pictures of themselves.

In other words, thought is the self-image of each thinker or self-consciousness. This type of self-consciousness is not that of a modern human as Hegel investigated in *Phenomenology of Spirit* but is the individual self-consciousness of the thinker.

As for Marx, the division between thinking and thought originates from the concept of ideology and the origin of his concept of ideology is his criticism of Hegel's self-consciousness. This criticism is the starting point for his new materialism and dialectical materialism, that is, the premise of his historical materialism. He criticizes Hegel's self-consciousness in *Economic and Philosophic Manuscripts of 1844*:

The main point is that the *object of consciousness* is nothing else but *self-consciousness* or that the object is only *objectified self-consciousness* – self-consciousness as object (positing of man = self-consciousness).

...

Man is equated with self. The self, however, is only the *abstractly* conceived man – man created by abstraction. Man is selfish. His eyes, his ears, etc. are *selfish*. But it is quite false to say on that account '*self-consciousness* has eyes, ears, essential powers.' *Self-consciousness* is rather a quality of human nature, of the human eye, etc.; it is not human nature that is a quality of *self-consciousness*.

...

For Hegel, the *human being* – man – equals *self-consciousness*. All estrangement of the human being is therefore *nothing* but *estrangement of self-consciousness*. The estrangement of self-consciousness is not regarded as an *expression* – reflected in the realm of knowledge and thought – of the *real* estrangement of the human being. Instead, the *actual* estrangement – that which appears real – is according to its *innermost*, hidden nature (which is only brought to light by philosophy) nothing but *the manifestation* of the estrangement of the real human essence, of *self-consciousness*. The science that comprehends this is therefore called *phenomenology*. All reappropriation of the estranged objective essence appears, therefore, as incorporation into self-con-

sciousness. The man who takes hold of his essential being is *merely* the self-consciousness which takes hold of objective essences (Marx 1975, pp. 333-334).

Marx also criticizes Hegel in *The Holy Family* from almost the same viewpoint.

Because Hegel here substitutes *self-consciousness for man*, the *most varied* manifestations of human reality appear only as *definite* forms, as *determinateness of self-consciousness*. But mere determinateness of self-consciousness is a '*pure category*,' a mere 'thought,' which I can consequently also transcend in 'pure' thought and overcome through pure thought. In Hegel's *Phänomenologie*, the *material, sensuously perceptible, objective* foundations of the various estranged forms of human self-consciousness, are allowed to remain. The whole destructive work results in the *most conservative philosophy* because it thinks it has overcome the *objective world*, the sensuously perceptible real world, by transforming it into a 'Thing of Thought,' a mere *determinateness of self-consciousness* and can therefore also dissolve its opponent, which has become *ethereal*, in the '*ether of pure thought*.' *Phänomenologie* is therefore quite consistent in that it ends by replacing human reality with '*absolute knowledge*' – *knowledge* because this is the only mode of existence for self-consciousness and because self-consciousness is considered the only mode of existence for man – *absolute knowledge* for the very reason that self-consciousness knows *only itself* and is no longer disturbed by the objective world. Hegel makes man the *man of self-consciousness* instead of making self-consciousness the *self-consciousness of man*, of real man, i.e., of man living in a real, objective world and determined by that world. He stands the world *on its head* and can therefore, *in his head*, so dissolve all limitations, which nevertheless remain in existence *for bad sensuousness*, for *real man*. Moreover, everything that betrays the *limitations of general self-consciousness* – all the sensuousness, reality, and individuality of men and of their world – is necessarily considered by him to be a limit. The whole of the *Phänomenologie* is intended to prove that *self-consciousness* is the *only reality* and *all reality* (Marx and Engels 1975, p. 192).

Here, Marx criticizes Hegel's self-consciousness from the viewpoint that the materialistic, objective world cannot be resolved by the self-consciousness, that is, the criticism of idealism from the viewpoint of materialism.

One must also make note of Marx's statement, "He stands the world on its head and can therefore, in his head, also dissolve all limitations, which nevertheless remain in existence for bad sensuousness, for real man." This is the first appearance of his note on dialectic, which appears later in the afterword of the second edition of *das Kapital*.

My dialectic method is not only different from the Hegelian but is its direct opposite.

To Hegel, the life process of the human brain, i.e., the process of thinking, which, under the name of ‘the idea,’ he even transforms into an independent subject, is the demiurugos of the real world and the real world is only the external, phenomenal form of ‘the Idea.’ With me, on the contrary, the ideal is nothing else than the material world reflected by the human mind and translated into forms of thought.

The mystifying side of Hegelian dialectic I criticized nearly thirty years ago, at a time when it was still the fashion.... The mystification which dialectic suffers in Hegel’s hands, by no means prevents him from being the first to present its general form of working in a comprehensive and conscious manner. With him, it is standing on its head. It must be turned right side up again if you would discover the rational kernel within the mystical shell.

In its mystified form, dialectic became the fashion in Germany because it seemed to transfigure and to glorify the existing state of things. In its rational form it is a scandal and abomination to bourgeoisdom and its doctrinaire professors, because it includes in its comprehension and affirmative recognition of the existing state of things, at the same time also, the recognition of the negation of that state, of its inevitable breaking up; because it regards every historically developed social form as in fluid movement, and therefore takes into account its transient nature not less than its momentary existence; because it lets nothing impose upon it, and is in its essence critical and revolutionary (Marx 1996, pp. 19-20).

Marx’s criticism of Hegel or the criticism of “standing on one’s head” is Marx’s new materialism in his *Theses on Feuerbach* and is the core of his dialectical materialism.

Marx’s criticism of Hegel’s self-consciousness was originally the means to criticize his opponent Bruno Bauer. He criticizes Bauer as follows:

Herr Bauer has recently re-christened absolute knowledge *Criticism* and given the more profane sounding name *standpoint* to the determinateness of self-consciousness....

Since the ‘*religious world as such*’ exists only as the world of *self-consciousness*, the Critical Critic – the theologian *ex professo* – cannot by any means entertain the thought that there is a world in which *consciousness* and *being* are distinct; a world which continues to exist when I merely abolish its existence in thought, its existence as a category or as a standpoint; i.e., when I modify my own subjective consciousness without altering the objective reality in a really objective way, that is to say, without altering my own *objective* reality and that of other men. Hence, the speculative *mystical identity of being* and *thinking* is repeated in *Criticism* as the equally mystical identity of *practice* and *theory*. That is why *Criticism* is so vexed with practice which wants to be something distinct from theory, and with theory which wants to be some-

thing other than the dissolution of a definite *category* in the ‘*boundless generality of self-consciousness*.’ Its own theory is confined to stating that everything determinate is an opposite of the boundless generality of self-consciousness and is, therefore, of no significance; for example, the state, private property, etc. It must be shown, on the contrary, how the state, private property, etc., turn human beings into abstractions, or are products of *abstract* man, instead of being the reality of individual, concrete human beings (Marx and Engels 1975, pp. 192–193).

As we can see by this citation, Marx had already developed his point of view in the *Theses on Feuerbach* and *The German Ideology*. His new materialism is expressed in the above citation as “the thought that there is a world in which consciousness and being are distinct; a world which continues to exist...when I modify my own subjective consciousness without altering the objective reality in a really objective way, that is to say, without altering my own objective reality and that of other men.”

On the other hand, Marx did not deny the self-consciousness, although he uncompromisingly criticized Hegel’s theory of self-consciousness. Marx defined socialism as the self-consciousness of an active human and he evaluated Hegel affirmatively even in the text of his Hegel criticism.

Inasmuch as it [*Phänomenologie*] depicts man’s *estrangement*, even though man appears only as mind, there lie concealed in it *all* the elements of criticism, already prepared and *elaborated* in a manner often rising far above the Hegelian standpoint. The ‘unhappy consciousness,’ the ‘honest consciousness,’ the struggle of the ‘noble and base consciousness,’ etc., etc.. – these separate sections contain, but still in an estranged form, the *critical* elements of whole spheres such as religion, the state, civil life, etc. (Marx 1975, p. 332).

Marx criticized the abstractedness of Hegel’s theory of self-consciousness but appreciated its concreteness. Most Marxists believe that materialism does not need self-consciousness and even consider self-consciousness as succumbing to idealism. As for Marx, however, this type of materialism belongs to the former materialism.

Section 2 What is Marx’s Dialectic?

Marx criticizes Feuerbach in *Theses on Feuerbach* because there is a deficiency of dialectic. Marx criticizes not only hitherto forms of materialism but also Feuerbach himself because of failing to grasp that activity = practice, although Feuerbach and these other forms of materialism do grasp the meaning of objects. This means that dialectic is to grasp that activity = practice and this is why Marx appreciated Hegel saying “the active side was set forth abstractly by idealism” (Marx 1976, p. 3). Marx’s appreciation of Hegel made it

possible for him to establish the concept of “objective activity” and historical materialism. In fact, the foundation of historical materialism is the “production of materialistic life” and we can easily discover that this phrase means “objective activity.”

Marx completed his criticism of Feuerbach’s “intuition” through his criticism of Hegel’s self-consciousness in *Economic and Philosophic Manuscripts of 1844* and this resulted in the following expression included in *Theses on Feuerbach*: “the active side was set forth abstractly by idealism – which, of course, does not know real, sensuous activity as such” (Marx and Engels 1976, p. 3).

Marx criticized Feuerbach’s “intuition” because it lacked an “intermediary.” This “intermediary” is the formula activity = practice, the dialectic, or Hegel’s phrase “the negation of the negation.” Marx explains this point as follows:

Feuerbach thus conceives the negation of the negation as a contradiction of philosophy with itself – as the philosophy which affirms theology (the transcendent, etc.) after having denied it, and which it therefore affirms in opposition to itself.

The positive position or self-affirmation and self-confirmation contained in the negation of the negation is taken to be a position which is not yet sure of itself, which is therefore burdened with its opposite, which is doubtful of itself and therefore in need of proof, and which, therefore, is not a position demonstrating itself by its existence – not an acknowledged position; hence it is directly and immediately confronted by the position of sense-certainty based on itself.

But because Hegel has conceived the negation of the negation, from the point of view of the positive relation inherent in it, as the true and only positive, and from the point of view of the negative relation inherent in it as the only true act and spontaneous activity of all being, he has only found the *abstract, logical, speculative* expression for the movement of history, which is not yet the *real* history of man as a given subject, but only the *act of creation, the history of the origin* of man.

We shall explain both the abstract form of this process and the difference between this process as it is in Hegel in contrast to modern criticism, in contrast to the same process in Feuerbach’s *Wesen des Christentums*, or rather the *critical* form of this which in Hegel is still an uncritical process (Marx 1975, p. 329).

In the first half of the above citation, Marx appreciates Feuerbach and at the same time criticizes him because “the position of sense-certainty.... directly and immediately confront[s]” Hegel’s “negation of the negation.” Apparently, this criticism implicates the criticism of “the form of object or of contemplation.” On the other hand, in the second half of the above citation, Marx criticizes Hegel but appreciates “negation of the negation” by saying “he has only found the abstract logical, speculative expression for the movement of history.” This is more explicitly expressed in the first of the *Theses on Feuerbach*:

The chief defect of all previous materialism – that of Feuerbach included – is that things [*Gegenstand*], reality, sensuousness, are conceived only in the form of the *object* or of *contemplation*, but not as *sensuous human activity, practice*, not subjectively. Hence, in contradistinction to materialism, the *active* side was set forth abstractly by idealism – which, of course, does not know real, sensuous activity as such. Feuerbach wants sensuous objects, really distinct from conceptual objects, but he does not conceive of human activity itself as objective activity. Thus, in *Das Wesen des Christentums*, he regards the theoretical attitude as the only genuinely human attitude, while practice is conceived and fixed only in its dirty-Jewish form of appearance. Hence, he does not grasp the significance of ‘revolutionary,’ of ‘practical-critical,’ activity.

In this thesis, Marx asks us to grasp “things [*Gegenstand*], reality, sensuousness” as “sensuous human activity, practice,” and does not stand, therefore, like Engels, on the naïve positivism that perceives an object “as it is.” The “as it is” cognition is based on subject-object dualism but Marx stands firm on the position of subject-object monism. If we fail to understand his monism, we cannot understand his criticism of Hegel in *Economic and Philosophic Manuscripts of 1844* or in *Theses on Feuerbach*, and we can easily confuse Marx’s dialectic with that of Engels.

Marx learned this subject-object monism through his criticism of Hegel’s self-consciousness because Hegel’s theory of self-consciousness is based on subject-object monism, although his theory makes the self-consciousness absorb all reality of the human-being. Marx states, “He stands the world on its head and can therefore, in his head, so dissolve all limitations.” Marx’s subject-object monism is from a standpoint that does not put self-consciousness ahead of the human but puts the human ahead of the self-consciousness.

In the case of such monism, there is no room for a split-off of epistemology (the theory of knowledge) and metaphysics (the theory of being) as there is no need for a new theory of knowledge. We need only “the critical form of this in Hegel’s still uncritical process” of history. Marx himself did just this in his criticism of Hegel’s self-consciousness from *Economic and Philosophic Manuscripts of 1844* to *Das Kapital*.

Engels assumed a dialectic only as a principle governing the directions of history. On the other hand, as cited above, Marx believes that the dialectic “...includes in its comprehension and affirmative recognition of the existing state of things, at the same time also, the recognition of the negation of that state, of its inevitable breaking up; because it regards every historically developed social form as in fluid movement, and therefore takes into account its transient nature not less than its momentary existence because it lets nothing impose upon it and is in its essence critical and revolutionary.” Thus, Marx’s criticism is equivalent to the dialectic.

As for Marx, practice, revolution, and criticism are all identical and his criticism in real-

ity is described in *Contribution to the Critique of Hegel's Philosophy of Law*, which includes the famous phrase "religion is the opium of the people." However, he does not mean to criticize religion with that simple phrase alone and the criticism of religion is not actually his final purpose.

Religious distress is, at the same time, the *expression* of real distress and also the *protest* against real distress. Religion is the sigh of the oppressed creature, the heart of a heartless world, just as it is the spirit of spiritless conditions. It is the *opium* of the people.

To abolish religion as the *illusory* happiness of the people is to demand their *real* happiness. The demand to give up illusions about the existing state of affairs is the *demand to give up a state of affairs which needs illusions*. The criticism of religion is, therefore, *in embryo, the criticism of the vale of tears, the halo* of which is religion.

...

The *task of history*, therefore, once the *world beyond the truth* has disappeared, is to establish the *truth of this world*. The immediate *task of philosophy*, which is at the service of history, once the *holy form* of human self-estrangement has been unmasked, is to unmask self-estrangement in its *unholy forms*. Thus, the criticism of heaven turns into the criticism of the earth, the *criticism of religion* into the *criticism of law*, and the *criticism of theology* into the *criticism of politics* (Marx 1975b, pp. 175-176).

Marx sees the role of criticism, i.e., the task of theory as the "task of philosophy, which is at the service of history" and explains that the goal "once the holy form of human self-estrangement has been unmasked, is to unmask self-estrangement in its unholy forms." The mask to be removed here includes law, politics, and civil society. Philosophy is at the service of history because according to Marx, the task of history is "to establish the truth of this world," that is, to establish true reality. As for Marx, therefore, the criticism is not mere advocacy for theoretical thinking but is a practical criticism as in the first of the *Theses on Feuerbach*. Marx has no interest in establishing scientific thinking (theoretical thinking) as a new theory of knowledge but his criticism demands that we "give up a state of affairs which needs illusions."

Chapter 2 Engels' Theory of Science

Section 1 Engels' Understanding of Hegel and His Tumble into Positivist Science

Dichotomies prevail in Engels' *Ludwig Feuerbach and the End of Classical German Philosophy*: the separation between system and method, the contrast between metaphysics and dialectics, the separation between the material and consciousness, the separation

between materialism and idealism, and the separation between science and philosophy. After revealing these dichotomies, Engels praises method, the material, materialism, and science and looks down on systems, consciousness, idealism, and philosophy. This is almost what Engels states in *Ludwig Feuerbach and the End of Classical German Philosophy*. Engels' explanation is quite clear and easy to understand but it is quite unsuitable to explain the most abstract thing, i.e., philosophy, and as such, it becomes an impossible explanation. In the end, Engels becomes a pseudoscientific positivist. His superficial dichotomies are in no way philosophy or science but are the worst examples of the self-alienation of the consciousness.

Engels' failure originates from his inability to study and understand Hegel, Feuerbach, and even Marx. As a result, he points out the "contradiction of system and method" in Hegel and proposes to abandon Hegel's conservative metaphysical system and extract only the revolutionary method of the dialectic from Hegel.

[I]n accordance with traditional requirements, a system of philosophy must conclude with some sort of absolute truth. Therefore, however much Hegel, especially in his *Logik*, emphasised that this eternal truth is nothing but the logical, or, the historical, process itself, he nevertheless finds himself compelled to supply this process with an end, just because he has to bring his system to a termination at some point or other. In his *Logik* he can make this end a beginning again, since here the point of conclusion, the absolute idea – which is only absolute in so far as he has absolutely nothing to say about it – 'alienates,' that is, transforms itself into nature and comes to itself again later in the mind, that is, in thought and in history. But at the end of the whole philosophy a similar return to the beginning is possible only in one way. Namely, by conceiving the end of history as follows: mankind arrives at the cognition of this self-same absolute idea, and declares that this cognition of the absolute idea is attained in Hegelian philosophy. In this way, however, the whole dogmatic content of the Hegelian system is declared to be absolute truth, in contradiction to his dialectical method, which dissolves all that is dogmatic. Thus, the revolutionary side is smothered beneath the overgrowth of the conservative side (Engels 1990, pp. 360–361).

What then, is the revolutionary side of Hegel's philosophy?

But precisely therein lay the true significance and the revolutionary character of Hegelian philosophy... that it once and for all dealt the death blow to the finality of all products of human thought and action. Truth, the cognition of which was the business of philosophy, was, in the hands of Hegel, no longer a collection of ready-made dogmatic statements, which, once discovered, had merely to be learned by heart. Truth now lay in the process of cognition itself, in the long historical development of science,

which ascends from lower to ever higher levels of knowledge without ever reaching, by discovering so-called absolute truth, a point at which it can proceed no further, where it has nothing more to do than to sit back and gaze in wonder at the absolute truth to which it had attained. And what holds good for the realm of philosophical cognition holds good also for that of every other kind of cognition and also for practical action. Just as cognition is unable to reach a definitive conclusion in a perfect, ideal condition of humanity, so is history; a perfect society, a perfect 'State,' are things which can only exist in the imagination. On the contrary, all successive historical states are only transitory stages in the endless course of development of human society from the lower to higher. Each stage is necessary, and therefore justified for the time and conditions to which it owes its origin. But in the face of new, higher conditions which gradually develop in its own womb, it loses its validity and justification. It must give way to a higher stage, which will also in its turn decay and perish. Just as the bourgeoisie by large-scale industry, competition and the world market dissolves in practice all stable time-honoured institutions, so this dialectical philosophy dissolves all conceptions of final, absolute truth and of absolute states of humanity corresponding to it. Against it [dialectical philosophy] nothing is final, absolute, sacred. It reveals the transitory character of everything and in everything; nothing can endure against it except the uninterrupted process of becoming and passing away, of ascending without end from the lower to the higher. And dialectical philosophy itself is nothing more than the mere reflection of this process in the thinking brain. It has, however, also a conservative side: it recognises that definite stages of cognition and society are justified for their time and circumstances; but only so far. The conservatism of this outlook is relative; its revolutionary character is absolute – the only absolute dialectical philosophy admits (Engels 1990, pp. 359-360).

Next, Engels encourages the abandonment of the system to resolve the "contradiction between system and method" and in the end, recommends naïve positivism.

With all philosophers it is precisely the 'system' which is perishable; and for the simple reason that it springs from an imperishable need of the human mind – the need to overcome all contradictions. But if all contradictions are once and for all disposed of, we shall have arrived at so-called absolute truth – world history will be at an end. And yet it has to continue, although there is nothing left for it to do – hence, a new insoluble contradiction. Once we have realised – and in the long run no one has helped us to realise it more than Hegel himself – that the task of philosophy thus stated means nothing but the task that a single philosopher should accomplish that which can only be accomplished by the entire human race in its ongoing development – as soon as we realise that, it is the end of all philosophy in the hitherto accepted sense of the world.

One leaves alone ‘absolute truth,’ which is unattainable along this path or by any single individual; instead, one pursues attainable relative truths along the path of the positive sciences, and the summation of their results by means of dialectical thinking. With Hegel philosophy comes to an end altogether: on the one hand, because in his system he sums up its whole development in the most splendid fashion; and on the other hand, because, even if unconsciously, he shows us the way out of the labyrinth of systems to real positive cognition of the world (Engels 1990, p. 362).

The nonsensical argument of the “contradiction between system and method” is the starting point for Engels’ dichotomies. He refers to the dichotomy between philosophy and science in the above citation and it was easy for him to come up with the idea of “the dichotomy between the material and consciousness.”

Section 2 “The Fundamental Issues of Philosophy” for Engels

Engels writes about the fundamental issues of all philosophies as follows:

The great basic question of all, especially of latter-day philosophy, is that concerning the relation of thinking and being. From very early times when men, still completely ignorant of the structure of their own bodies, and prompted by dream apparitions came to believe that their thinking and sensation were not activities of their bodies, but of a distinct soul which inhabits the body and leaves it upon death – from this time men have been driven to reflect about the relation between this soul and the outside world....

Thus the question of the relation of thinking to being, of the mind to nature – the paramount question of the whole of philosophy – has, no less than all religion, its roots in the narrow-minded and ignorant notions of savagery....

Answers to this question split the philosophers into two great camps. Those who asserted the primacy of the mind over nature and, therefore, in the last instance, assumed world creation in some form or other... comprised the camp of idealism. The others, who regarded nature as primary, belong to the various schools of materialism. These two expressions, idealism and materialism, originally signify nothing but this; and here they are not used in any other sense either (Engels 1990, pp. 365-367).

This is an astonishingly simple summarization of the history of philosophy! Most hitherto existing Marxists have never studied the history of philosophy and had no doubts regarding such a simple summarization. If only they had read Hegel’s *Lectures on the History of Philosophy*, they would have easily understood that the distinction between idealism and materialism was not a fundamental problem of philosophy, contrary to Engels’ argument. Hegel himself joked about this inane dichotomy in his *Phenomenology* and *Logik* but never

attempted to criticize it in earnest.

Engels allegedly discovers another important side of this dichotomy – the relationship between thinking and being.

But the question of the relation of thinking and being has yet another side: in what relation do our thoughts about the world surrounding us stand to this world itself? Is our thinking capable of the cognition of the real world? Are we able in our ideas and notions of the real world to produce a correct reflection of reality? In the language of philosophy this question is called the question of the identity of thinking and being, and the overwhelming majority of philosophers answer it in the affirmative. In Hegel, for example, its affirmation is self-evident: for what we cognize in the real world is precisely its thought content – that which makes the world a gradual realization of the absolute idea, which absolute idea has existed somewhere from eternity, independent of the world and before the world....

In addition there is yet another set of philosophers – those who dispute the possibility of any cognition, or at least of an exhaustive cognition, of the world. Among them, of the more recent ones, we find Hume and Kant, and they have played a very important role in philosophical development. What is decisive in the refutation of this view has already been said by Hegel, as far as this was possible from an idealist standpoint. The materialist additions made by Feuerbach are more quick-witted than profound. The most telling refutation of this as of all other philosophical quirks is practice, namely, experimentation and industry. If we are able to prove the correctness of our conception of a natural phenomenon by bringing it about ourselves, producing it out of its conditions and making it serve our own purposes into the bargain, then the ungraspable Kantian ‘thing-in-itself’ is finished. The chemical substances produced in the bodies of plants and animals remained just such ‘things-in-themselves’ until organic chemistry began to produce them one after another, whereupon the ‘thing-in-itself’ became a thing for us, as, for instance, alizarin, the coloring matter of the madder, which we no longer trouble to grow in the madder roots in the field, but produce much more cheaply and simply from coal tar (Engels 1990, pp. 367–368).

The citation above would be Engels’ interpretation of the first and second of the *Theses on Feuerbach*, but he missed the correct context of the second thesis. Therefore, “practice” should not be reduced to mere “experimentation and industry.” Marx thought of practice as historical movement but Engels apparently thought of practice mostly in the context of natural science, especially the natural science driven by modern industry. His ideas originate, of course, from his odd theories regarding modernism and pseudo-positivism.

After reducing philosophy to only the dichotomy between idealism and materialism, En-

Engels simplified Hegel's thoughts to say the "Hegelian system represents merely a materialism idealistically turned upside down in method and content" (Engels 1990, p. 368). This interpretation of Hegel makes Marx's turning-upside-down interpretation nonsensical and resulted in Althusser's hatred of the dialectic.

Engels looked back on his theoretical development and appreciated Feuerbach for helping him overcome Hegel:

One must have experienced the liberating effect of this book [*Wesen des Christentums*] for oneself to get an idea of it. Enthusiasm was universal: we were all Feuerbachians for a moment. How enthusiastically Marx greeted the new conception and how much – in spite of all critical reservations – he was influenced by it, one may read in *The Holy Family* (Engels 1990, p. 364).

Additionally, in reality, Engels expressed his enthusiasm in *The Holy Family* as well.

In this article about Absolute Criticism, which has never freed itself from the cage of the Hegelian way of viewing things, storms at the iron bars and walls of its prison. The 'simple concept,' the terminology, the whole mode of thought of philosophy, indeed, the whole of philosophy, is rejected with disgust. In its place we suddenly find the 'real wealth of human relations,' the 'immense content of history,' the 'significance of man,' etc. 'The mystery of the system' is declared 'revealed.'

But who, then, revealed the mystery of the 'system?' *Feuerbach*. Who annihilated the dialectics of concepts, the war of the gods that was known to the philosophers alone? *Feuerbach*. Who substituted for the old lumber and for 'infinite self-consciousness' if not, indeed, 'the significance of man'... at any rate 'Man?' *Feuerbach*, and only *Feuerbach* (Marx and Engels 1975, pp. 92–93).

In *The Holy Family*, on the other hand, Marx placed Feuerbach in the history of German idealism and explained the relationship between his theory of self-consciousness and that of Feuerbach.

The dispute between *Strauss* and *Bauer* over *Substance* and *Self-Consciousness* is a dispute *within Hegelian* speculation. In *Hegel* there are *three* elements, *Spinoza's Substance*, *Fichte's Self-Consciousness* and *Hegel's* necessarily antagonistic *unity* of the two, the *Absolute Spirit*. The first element is metaphysically disguised *nature separated* from man; the second is metaphysically disguised *spirit separated* from nature; the third is the metaphysically disguised *unity* of both, *real man* and the *real human species*.

Within the domain of theology, *Strauss* expounds *Hegel* from *Spinoza's point of view*,

and Bauer does so from *Fichte's point of view*, both quite consistently. They both *criticised* Hegel insofar as with him each of the two elements was *falsified* by the other, whereas they carried each of these elements to its *one-sided* and hence consistent development. – Both of them therefore go *beyond* Hegel in their criticism, but both also remain *within* his speculation and each represents only *one* side of his system. *Feuerbach*, who completed and criticised *Hegel from Hegel's point of view* by resolving the metaphysical *Absolute Spirit* into 'real man on the basis of nature,' was the first to complete the *criticism of religion* by sketching in a grand and masterly manner the *basic features* of the *criticism of Hegel's speculation* and hence of *all metaphysics* (Marx and Engels 1975, p. 139).

Based on this citation, apparently Marx did not appreciate *Das Wesen des Christentums* as much as Engels. He appreciated *Grundsätze der Philosophie der Zukunft* and saw it as a criticism of religion. Here we find another example of Engels' fabrication of the history of Marxism.

Chapter 3 The Role of Theory in Natural Science

Heidegger criticizes the non-historical implicit premises (impartiality, objectivity, and so on) and the philosophy of science criticizes logical defects in the natural sciences (inductive reasoning, assumption of the uniformity of the world, and so on). These views see science as a kind of thought that attempts to absorb the real world into self-consciousness but theories of the natural sciences are produced through dialogues with the natural world (experiments and observations) and those dialogues are the human practices we use to understand nature. In this sense, they are theories not thought (Cf. Chapter 1).

In the history of the natural sciences, there were times when natural studies were performed as investigations of thought. Philosophers in ancient times and the Middle Ages put less attention on experiments and observations and pursued the consistency and purposefulness of thought (Cf. Weinberg 2016; Asimov 1979). Science, however, is the human practice used to grasp the concept of nature and has no intention of deducing or proving the existence of nature itself. Thus, the natural sciences should be evaluated from the viewpoint of the evidence of reason (a monistic viewpoint) not from the viewpoint of cognitive thought (a dualistic viewpoint).

I would now like to present the example of Ludwig Boltzmann, the founder of statistical thermodynamics. Boltzmann attempted to explain heat and pressure as the movement of atoms and molecules in the second half of the 19th century when some chemists alleged the existence of atoms and molecules but the energetist theory of heat still prevailed. Boltzmann established H theory or the theory of decreasing entropy according to time.

This theory was, at the time, already accepted in most European countries because it

explained various thermodynamic phenomena. However, in Germany, he was severely attacked by “energetists” (especially Friedrich Wilhelm Ostwald) and “anti-atomists” (especially Ernst Waldfried Josef Wenzel Mach).

Boltzmann developed his theory from Newtonian mechanics, which implies the reversibility of the movement of objects, but his theory implies the irreversibility of the heat phenomenon. He used the mathematical probability theory to explain irreversibility and founded statistical thermodynamics.

He was also asked to show evidence for the existence of atoms and molecules. This was scientifically impossible at the time but Boltzmann believed that this impossibility did not undermine the effectiveness of his theory; the “energetists” and “anti-atomists” asked for a proof (legitimacy) beyond natural science.

No matter how successful atomic theory might be – and even at the end of the 19th century its successes remained arguable – it was impossible to prove that atoms were real. Atomism might, Mach allowed, constitute an acceptable model, a set of mathematical relations that yielded correct answers, but nowhere in any of that can there be any objective proof that atoms existed. The fact that the theory worked was not enough to prove that the assumptions on which the theory rested were true. That was a circumstantial case only.

This is the heart of the dispute between Mach and Boltzmann. It remains to this day unresolved, because the two sides are not debating the specifics of any theory, but applying different standards to what a theory should be (Lindley 2001, p. 168).

Critics of Boltzmann were all philosophical dualists.

Kant was the last in a long line of philosophers, going back to Plato and Aristotle, who took what is sometimes called an idealist or rationalist point of view. They believed that the only secure and trustworthy source of knowledge was the human mind itself, and so believed that all practical knowledge – astronomy, geometry, science as a whole – ought to be based on some combination of indisputable principles of reason and self-evident, therefore also indisputable, facts (Lindley 2001, p. 169).

On the other hand, most scientists outside of Germany had little interest in such debates.

Maxwell, Gibbs, and their compatriots tended to work blithely in the pragmatic, empirical style and to disregard philosophy. Apart from scientific considerations, this was why the strictures of Mach and the energeticism of Ostwald found few takers in the English-speaking world. The Irish physicist George Fitzgerald derided energeticism as ‘a sort of well-arranged catalogue of facts without any hypotheses... worthy of a Ger-

man who plods by habit and instinct (Lindley 2001, p. 170).

In the human and social sciences, such naïve and simple attitudes are sometimes not permitted. Ethics and laws, which are imposed on people and sometimes result in executions, are important examples of such theories. Thus, the legitimacy of these theories is indispensable and their critics have sometimes paid with their lives in challenging them. The worry was that they would damage social integration, even though they only wanted to study these theories, as natural scientists do. The “naïve and simple attitudes” toward systems could result in an enormous critical enfeeblement of the human and social sciences. The tragic destiny of Socrates provides a good example.

You do know what sort of man Chaerephon was, how vehement he was in whatever he would set out to do. And in particular he once even went to Delphi and dared to consult the oracle about this – now as I say, do not make disturbances, men – and he asked whether there was anyone wiser than I. The Pythia replied that no one was wiser. And concerning these things his brother here will be a witness for you, since he himself has met his end.

Now consider why I say these things: I am going to teach you where the slander against me has come from. When I heard these things, I pondered them like this: ‘What ever is the god saying, and what riddle is he posing? For I am conscious that I am not at all wise, either much or little. So what ever is he saying when he claims that I am wisest? Surely he is not saying something false, at least; for that is not sanctioned for him.’ And for a long time I was at a loss about what ever he was saying, but then very reluctantly I turned to something like the following investigation of it.

I went to one of those reputed to be wise, on the ground that there, if anywhere, I would refute the divination and show the oracle, ‘This man is wiser than I, but you declared that I was wisest.’ So I considered him thoroughly – I need not speak of him by name, but he was one of the politicians – and when I considered him and conversed with him, men of Athens, I was affected something like this: it seemed to me that this man seemed to be wise, both to many other human beings and most of all to himself, but that he was not. And then I tried to show him that he supposed he was wise, but was not. So from this I became hateful both to him and to many of those present (West 1979, p. 4).

Socrates seemed to see the views of those who were “reputed to be wise” regarding truth, bravery, justice, and so on as only means of investigating theories such as those of natural science, but for those who were criticized by Socrates, their views had some compelling power to produce order in the real world and support their self-respect.

Conclusion

Marx defines science as the human practices used to understand nature and theories in science are a means to investigate the objective world. They do not produce the real world or impose any order on the real world like theories in ethics or law. Marx uses categories such as the dialectic or denial of denial in his investigation as long as such categories are useful to grasp the real world, not because he is caught up in Hegelian thought. Engels misunderstood Marx's intention and developed dualistic Marxism, which makes it difficult to learn the truth about Marx and unintentionally maligns the reputation of science.

Plato argued that the true world is not a permanent variation of the sensuous world but is a world of ideas, which can be grasped through human reason and endures forever beyond time and space. For Plato, the real sensuous world is a mere copy or icon of the world of ideas. On the contrary, Aristotle denied the world of ideas, which exists outside of the real sensuous world and pointed out difficulties in Plato's theory.

Aristotle utilized the concepts of *energeia* and *dynamis* to overcome these difficulties and to understand the relationships between form and matter from a different viewpoint. According to him, all things, regardless of whether they are natural or artificial, move to realize their forms, to actualize themselves (*energeia*), or to attain their fundamental essences. His view of the world is teleological, where all things are energized to actualize their telos of existence (the world of self-actualization).

Plato and Aristotle's view of nature is apparently different from that of modern natural scientists who are not their direct descendants. Marx's monistic view of science can be used to more accurately explain modern natural science.

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