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The Necessity of Interaction between Metaphysics and Sciences

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of knowledge based on ideal rationalism. This new insight began with Descartes and Hobbes and finally was completed by the critical philosophy e.g. Kant. Whether Kant was aware of his work or not is not so important, the matter which manifested itself in Kant's work was the very diremption in the second stage of metaphysics. In this period, the second phase of modern classic science emerged. Even in humanities, disciplines such as anthropology, culture, history, and language challenged the core of metaphysics. The third stage of diremption occurred in the period of techno-science. In this article, conversely, with an image of diremption between metaphysics and science the necessity of their interaction was discussed. Advising this interaction can only be carried out by founder thinkers. Attention to these effective factors in this diremption, perhaps, can assist to find the pathway of this interaction. The key factors, especially in modern epoch can be as the following: Reductionism, which has been the outcome of positivistic view in fields of metaphysics and sciences, that is, reduction of all knowledge to positive science, which can be exemplified in physics and in the radical form of it, take physicalism for instance. Secondly, the distinction of fact-value, whose logical form manifested itself in the form of knowledge and value, in relation between "ought" and "is", must be understood. Thirdly, in gradual ignorance of end of ends (God in traditional metaphysics) and first principle/arché (God in modern metaphysics) and His presence in nature and society, reflection is of necessity. These all cannot be feasible unless our notion of science and the present-day hierarchy becomes transformed and again metaphysics stands on top of the hierarchy of science to be able to answer all boundary questions, interacting with sciences. Finally, it is worth indicating that the revival of interaction between metaphysics and sciences is not only an academic necessity but also is associated with fate of human. Whitehead held that science and metaphysics in a sense are merely different modes of great unified activity of human mind. Their interaction can elevate us to a higher level of animal life (Whitehead, 1371/1992, p. 229). It is entirely appropriate that metaphysicians assume responsibility for contemplating the nature and outcomes of science.

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altering into the dominant rationality of the Enlightenment. This type of rationality was transformed throughout the second phase of modern classic science and was followed until the classic epoch of science in the 20th century. The latter form of rationality was called and discussed as subjective and formal reason versus objective reason of metaphysics by thinkers of Frankfurt school. (Horkheimer, 1974, pp.3-11) for its foundation was the subjectivism that had been formed from Descartes until Kant. In the 2nd epoch of classic science, another form of rationality which is called rationalization was developed. This form of rationality was known as technical, or instrumental and *zweckrationalitat*. Perhaps, the actualization of this rationality and logic and techno-science, could be identified as one. Such a calculating and systematizing reason/logos has itself organized a mode of rationality, even outside the realm of science, i. e. in the social life and its influence on bureaucracy, economics and law can be clearly observed.

In short, the last three forms of rationality have always been interacting with each other in the history of science and Western metaphysics. At a time, one form becomes dominant and at another time, the other. As an example, the dominance of contemporary logistic rationalization could not eliminate or exclude other forms. In principle, the thing which has remained from the traditional metaphysics legacy is the actualization of reason in various forms of rationality. However, it must be noticed that the metaphysical reason is not solely the primary form of rationality. The metaphysical reason began with Socrates, through the confrontation of this reason with the pre-Socratic one, and reached a status with Plato and Aristotle. Therefore, the study of forms of rationality can be observed in terms of interaction of metaphysics and sciences.

Conclusion

Anyhow, as a conclusion of this article, interaction between metaphysics and sciences can, in general, be studied in three stages; the first stage is that long period of Aristotelian sciences and metaphysics. The other two stages were actualized by the scientific revolution, in which the diremption between science and metaphysics manifested itself more than before. In Aristotelian system, metaphysics and sciences were established around *theoria* and the dominance of metaphysical idea of reason/ logos (Politis, 2004, p.10). After the scientific revolution, science or the so – called natural philosophy claimed independence in order to be freed from the control of metaphysics. This meaning was actualized by the new concept

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It seems that the meaning and nature of rationality had been transformed from one epoch to another and fundamentally, the function of rationality is not providing the prevailing intellectual procedures and methods any more.

Whatever is called rationality in each period is the philosophical formulation norms and procedures which inherent from the discourses of that epoch. The importance of philosophy is in concluding, summarizing and informing these transformations. In the modern era, scientific discourses have been principal components of formulation of rationality. Even at times rationality and scientific methodology are viewed as one. Of course, other notions of rationality are available, which for instance are based on dialectical logic. Throughout history of metaphysics and Western sciences, there have been various definitions and concepts of rationality. But perhaps three forms of rationality could be distinguished in brief as the following:

- 1- reason/ logos
- 2- rationalism, and
- 3- rationalization.

These concepts are at the highest degree of universality or in Weber's sense, are ideal types of sociological constructs, which are used to facilitate comparison, analogy and contrast in the raised rationality forms in history. These instances at the degree of realization and exploitation would have a heuristic aspect (Redner, 1986, p.42).

Of course, it should be noticed that these ideal types are not the outcomes of imaginations of past generations the departed but their structure rests on actual ideals of rationality which have been raised throughout in the history of science and metaphysics. Logos had been thought not as an exclusive aspect but as a dominant aspect of rationality in the epoch of science. Such rationality was bound up with platonic and Aristotelian metaphysics. Yet this interpretation of rationality, that is the Platonic-Aristotelian interpretation, which subsumed the system of knowledge to be under hierarchical categories, had not been the only concept of rationality, but this concepts differs and changes while transferring from epoch to epoch and from culture to culture. Such rationality as mentioned before originated in Greek logos .In its movement in middle age, it transformed into Ratio and finally altered into Vernunft in metaphysics of Aufklärung and in particular appeared in German idealism and Hegel. The rationality of modern science was defined by conception by Bacon, Descartes, and Newton in the first period of modern classic science and subsequently became generalized,

philosophies of vitalism in connection with biology and all that were developed. Philosophies which were based on subconscious dimension of human were also joined with new psychiatrics and even Freudian psychoanalysis and other similar cases (Redner, 1986, p. 39). In contrast to these attempts which viewed philosophy as based on science, there were philosophies that completely separated themselves from science. These philosophies, including neo-Kantians, lean towards pure philosophy.

Phenomenology discussed, in some way, pure science of *eidōs* (a **Husserlian term**). In spite of the fact that pure philosophies raise their own technical problems and attempt to survive against the external critique, they lose their major task in this regard. Therefore at the beginning of the third period of science after World War II, these philosophers rescued themselves against the charges in the sphere of science and survived from the hegemony of techno-science. Vitalism, too, could not survive in confrontation with the new genetic science, which had proved evolutionist philosophies wrong. Philosophies of language look quite pass in contrast with new linguistic sciences such as structuralist linguistics. Perhaps with formulation of certain academic problems about pure philosophies, philosophy could provide its sufficient reasons but it should be noticed that at present philosophy is, more or less, at danger since in addition to diremption of its interaction with science, it has also lost its critical roles of guidance and formulation of prevailing rationality over historical periods of human science. Metaphysicians always believe that metaphysics is the standard of rationality for different disciplines and branches of science or at least, view it as the guarantee of rationality of realms of science, for the unity and continuity of logos has been the implicit presupposition throughout all the history of philosophy despite all its transformations. This is clear from Aristotle's initial attempt in the beginning of metaphysics until Hegel's explicit formulation of Geist and its development. Still a few philosophers argue that philosophy is the criterion for rationality and that is why its main task is to support simply the reason / logos which is the criterion of discourse and historical development.

Toulmin and Habermas attempted to come up with new versions of that traditional assumption. Whether their efforts are timely or not is another issue. What is obvious at first glance is that these sciences, no longer, have anything to do with philosophies and they go their own way. The standard of scientific rationality in the age of dominance of science no longer harbors its previous meaning. (Redner, 1986, p. 41).

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rapid growth of science in the 19th and 20th century. In the 2nd phase of modern era, classic science faded away. Nonetheless, these attempts can be well worth reflecting on for sociology of science and philosophy. However, despite the empiricist philosophers, Locke's predecessor, Descartes never ceased to pursue the foundation of metaphysics of science and as mentioned before was always determined to base his scientific certainty on a metaphysical foundation. Yet, Descartes' efforts were more of an epistemic nature than a metaphysical one. Still in this period, even empirical philosophers such as Hobbes and Locke were not able to completely liberate themselves from the authority of metaphysics. Such liberation could lead somewhere only after Kant. Kant's Copernican Revolution which looked for the foundations of sciences in *a priori* categories of understanding, could complete the foundations of knowledge. Indeed, Kant was willing to separate scientific knowledge from metaphysical elements. Nonetheless, the first period of classic science was based on metaphysics in terms of methodology. But in the second phase of classic science it was not so and the metaphysical foundation of sciences transformed into methodology. Hence, philosophies of this period struggled to rescue themselves from their task coming to an end. This concept has been repeatedly indicated in philosophical works of this period.

Positivists from Comte and Saint Simon to Carnap and lately Popper were all of this opinion with a little differences of course (Redner, 1986, p. 38). In fact, positivists who emphasized on the idea of positive science were determined to declare the end of metaphysics. In this period of philosophy, not only positivists but also their contemporaries in other schools of philosophy such as Max and his followers spoke of the end of philosophy and metaphysics. Marx wrote: the last hours of old metaphysics' life in the realm of philosophy is passed... once speculations come to an end, where true life begins, in consequence real and positive science, description of scientific activity, explanation of scientific process of human evolution would commence... (Marx, 1972, p. 48). He also said, now here is the end of speculation and the beginning of positive science. However, in this period of science (the 2nd period of modern classic science) the traditional transaction between science and metaphysics become transformed so that contrary to the traditional era, philosophy was based on science.

For instance, empirical psychology looks a form of scientific philosophy and "ideology" was emphasized, which both originated in science. Darwin's theory, too, was formed as a social Darwinism. Even

Wittgenstein's "Tractatus", which is the ripe fruit of logical positivism, bears similarities with Spinoza's work, throughout which more or less the axiomatic method pervade, yet it has nothing to do with Spinozistic point of view. And while Wittgenstein's "Philosophical Investigations" is close to Husserl's "Logical Investigations" in terms of time and place, they share less similarities. (Redner, 1986, p. 37).

That is to say, this diremption derives from a rigid metaphysical tradition that separates two masterpieces of recent German Philosophy from one another. Even Wittgenstein himself was not quite certain that what he had done could be called philosophy, though he held that he inherited the legitimacy of what his predecessors named philosophy. However, philosophy, in its professional sense, has distanced itself from its traditional history because of its engagement in technical issues in linguistics and logic since the time of Wittgenstein. This type of metaphysics and philosophy is completely separate from sciences of its time and this diremption has caused the interaction between metaphysics and sciences to almost vanish into thin air. The historical evolution of interaction between metaphysics and sciences was certain until the period of scientific revolution, exactly when modern science declared its independence. Nonetheless, in the first period of science, Aristotelian metaphysics pursued metaphysics, that is, natural world and all the sciences concerning it were placed under the metaphysical knowledge. It goes without saying that, such metaphysical control over modern science is bound to fail. Perhaps some contemporary philosophers have meant to present a new alternative in this case through raising the issue of Being and its priority to other subjects again.

Martin Heidegger writes "The Scientific fields are quite diverse. The ways they treat their objects of inquiry differ fundamentally. Today only the technical organization of universities and faculties consolidates this burgeoning multiplicity of disciplines; the practical establishment of goals by each discipline provides the only meaningful source of unity. Nonetheless, the rootedness of the Sciences in their essential ground has atrophied." (Heidegger, 1978, p 96). Of course, the last statement can be disputed. Yet by the advent of the tradition of empiricism and philosophers of Aufklärung, philosophy was exempted from such task. Maybe only Hegel and a few other German idealist philosophers attempted to revive this responsibility of philosophy. Hegel complained metaphysics is like an abstract word and is so similar to a literal thought that everyone escapes from it as if they run away from plague. (Heidegger, 1384/2005, p. 191). But these attempts coincided with the

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the 17th and 18th centuries, which he calls the acquisition of wealth, from political economics of the 19th century. (Foucault, 1970, p. 250). Of course Foucault's episteme of sciences can be refuted, yet the point that sciences transform from one period to another is a matter of general agreement.

Anyhow, sciences experience overwhelming changes through different periods. In the Post – War era, these changes were visible almost in all sciences. Following these transformations, Sciences possessed these qualities:

1. technification 2. formalism 3. abstractions 4. problem-solving 5. finalization (Redner, 1986, p.36) The first quality characterizes the outstanding significance of technology and its modes. The second quality mirrors the tendency of some pure sciences to design an axiomatic system or its alternative, i. e., designing and planning digital programs. The third and fourth qualities involved a redefinition of problems and difficulties which should be dissolved through referring to abstract models. The fifth quality is a new term in sociology of science and reflects the increasing importance of external conditions, ends and objectives in articulation of theory in science. (Tavakkol, 1370/1991, p.83) Regarding the condition of science especially by considering the cited qualities, it is generally observed that metaphysics can no longer play a guiding role in the direction of techno-science, in contrast to its role in Aristotelian science or empiricism in classic science or even positivism in the second period of classic science in the 19th and 20th centuries. The latter statement would be correct on the condition that we cannot ignore its tradition and authority or authenticity in philosophy and metaphysics, that is to say, the pursuit of metaphysics in the traditional texts and balancing the outcome with those great traditional texts; yet if metaphysics stands out of this tradition and looks beyond that, as founder philosophers did, the possibility of metaphysics leading sciences would be realized. A founder philosopher may speak utilizing commonly used terms, but what they mean to say is deferent. For instance, Descartes may call his work "Meditations on First Philosophy" yet what he means by "First Philosophy" differs from the Aristotelian concept. In a letter to Mersenne, he writes: "Meditations on First Philosophy" apparently have interesting themes for common church beliefs but deep down they are my principles of physics, thus do not share anything about with anyone until Aristotelians become accustomed to it. (Sorell, 1379/2000, p. 75)

second period is science in the middle ages which begins with Muslim and Christian scholastics, and finally the third period is science in the Renaissance period which possesses its own characteristics. Sciences in the Renaissance period led to modern science or Newtonian science. This modern science period, which is a bridge between Galileo and Einstein, is the classic modern period and the so-called scientific revolution appears in this time, which is entitled "Paradigmatic Science" by Kuhn, and the period before, in general, is named pre-paradigmatic period or in fact pre-scientific by him. (Kuhn, 1970, pp.67-8)

This period of modern classic science can be, in turn, categorized at least into two phases; the first phase includes the time between industrial revolution and French revolution.

The second phase begins with the institutionalization of science in the early 19th century in France and spreads in many German universities and continues until the end of the World War II. During the second World War, science enjoys a considerable leap in war technology and social welfare and political respect continues until the Cold War. This development, in the view of some historians of science, is considered the start of Post-Einstein development of science, which is known as Big science. The latest phase of science is less determined by great names but is mostly linked with impersonal scientific institutions and organizations. (Redner, 1986, p.35) One of the characteristics of this period has been its separation from the classic science which is lately regarded as a part of programs of sociology of science. Sciences were subjected to transformation in historical epochs according to the dominant rational realm or historical spirit of each period. For instance, music was considered a part of sciences in middle ages, yet in the period of authority of classic science in modern epoch saw a decline. Grammar in the beginning of classic science period was included in science but it is no longer so, while philology took its place which ultimately led to linguistics, and perhaps, mathematics, physics and cosmology could be more or less viewed as exceptions.

However, the history of this group of sciences, now evidently shows enough evidence that these sciences are also distinct so that, in the view of some philosophers of science, these sciences are not comparable with one another. These philosophers think that neither the cosmology of Ptolemy is consistent with Copernican cosmology nor Newtonian physics with Aristotelian physics (Ibid. p,36). There are thinkers who regard the synthesis of different subjects of one period of science as independent sciences. For instance, Foucault separates the economics of

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of them regard metaphysics as unnecessary if not nonsense. The separation of science and metaphysics doesn't seem to be simply a technical-academic matter but a peril concerning human life. Science without metaphysics is blind and fails to find its direction. Metaphysics, too, without science is deaf and dumb and unable to pronounce any judgment on reality. Provided that we take the side of scientists, to some extent, we would be obliged to mention that the diremption between sciences and metaphysics in our times means the separation of philosophy from most of the epistemic fields, since almost all the realms of episteme are now the subject matter of sciences. It seems that metaphysics, at the present time, has not been able to establish a relation towards unity of the fields which were the subjects of philosophy in the past such as ethics, art and religion.

On the other hand, these problems are not regarded as crucial in the view of scientists and at times some philosophies such as positivism have included these issues in the sphere of desires, tastes and emotions. However, contemplation on the relation between metaphysics and sciences as well as consideration of the historical interaction between them is of necessity. Of course, the interaction of metaphysics with other fields of knowledge is also crucial and well worth reflecting upon. Metaphysics, in its history, has greatly influenced theology, ethics, arts as well as natural and social laws practiced in realms of politics and society. Of course, we must think about this matter that if metaphysics has no effect on the fields of sciences, how beneficial can its impact on other fields of science and culture be?

Explanation and Further Elucidation

Historically, the interaction of metaphysics and sciences has experienced fluctuations. In each historical period, metaphysics has had specific influence on sciences.

At first glance, three significant periods can be distinguished in the development of history of science and of course each of these periods can have other subdivisions as well. (Hull, 1363/1984, p.5). The first phase can be called the Aristotle epoch, which begins with Aristotle and ends with Copernicus (1473-1543) periods, and that is considered the last link from the Aristotlian epoch and the first link from the modern cosmologicians. Three phases can be separated from each other in this period of 2000 years. Firstly, science in the ancient period includes the Alexandrian sciences and stoic as well as the peripatetic sciences. The

Introduction

Provided that we skip some exceptions, the diremption of relation between metaphysics and sciences can still be discussed. Science, all at once, released itself from the powerful dominance of metaphysical tradition.

Of course, this was an inevitable phenomenon in the development of history of Western science, However, most scientific concepts originate in metaphysics in a way that metaphysical principles have frequently been sources of scientific theories (Burt, 1964, P.10).

What is meant by metaphysics in this paper is the same as "meta ta phusica", which was applied to Aristotle's writings by Andronicus de Rhodes according to a historical account. Aristotle himself calls this Science by three titles: *theologia*, *sophia* and *proto philosophia*. (Aristotle, 1367/1988, p. 40). Early Aristotelian commentators had also articulated this issue elaborately. Also in Islamic philosophy, main interpretations were available for philosophers such as Farabi and Avicenna and more or less caught a lot of attention. (Avicenna, 1960, p21). There are other views concerning the terminology of metaphysics, which are beyond the borders of this discourse. One of them is Martin Heidegger's view. Heidegger explores metaphysics on the basis of the meaning of *phusis* in ancient Greek philosophy. (Heidegger, 1978, p 92). However, metaphysics, from the outset of its genesis, has yearned to maintain its own role in the establishment of fundamental rational relations among sciences, hence it kept to retain the unity of sciences as a coherent body of knowledge, as there had been such a structure in Aristotle's metaphysics and sciences.

In general, it can be argued that such a tradition, despite different interpretations up to the advent of positivism in modern epoch, had been continued. Positivism, by putting forward an anti-metaphysical plan brought about a gap or diremption in the unity of metaphysics and sciences.

Of course, the utopian plan of positivism has never been realized and at the present time has lost its validity and legitimacy. Thus, it seems that today's sciences develop without the assistance of philosophy and are proliferating in an uncontrollable manner.

Therefore, it seems rather difficult for them to gain reconciliation among each other without reflection on relation between metaphysics and sciences. It is clear that this meditation must be carried out by metaphysicians. Since scientists are absorbed in their own problems, all

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Abstract

This paper is a reflection on the interaction between metaphysics and science that has been existed since the pre-modern epoch, an example of which was actualized in Aristotle's system of metaphysics and science. Yet, this interaction was gradually undermined by the advent of scientific revolution especially the classic period of science in the 17th and 18th century in modern epoch. In the 19th century, the appearances of positivism caused metaphysics lose its meaningfulness and laid it aside from the realm of episteme and then put it in the sphere of tastes, emotions and passions. In the 20th century, philosophies and metaphysical systems, in the common sense, failed to direct sciences and claimed a sort of independence from sciences through raising technical problems in fields of language and logic.

However, this independence supported metaphysics and philosophy versus techno-science, in the meanwhile metaphysics lost another main role, the raising rationality in the field of sciences. This article explains this problem after a brief introduction and argues that pursuit of this issue is not a technical-academic problem but a matter of human life.

Keywords: *metaphysics, sciences, interaction, diremption, rationality.*

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[تاریخ دریافت: ۱۳۸۸/۵/۱۸؛ تاریخ تایید: ۱۳۸۸/۶/۲۷]