IDEALIST ELEMENTS IN THOMAS KUHN'S PHILOSOPHY OF SCIENCE

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1. INTRODUCTION

THOMAS KUHN'S theory marks a turning point of sorts in the history of philosophy of science. This is well-known and practically undisputed. Only since Kuhn's *Structure of Scientific Revolutions (SSR)* of 1962 have terms like "scientific revolution," "paradigm," "paradigm shift" become common place. But this already seems to be the end of the general agreement on Kuhn's theory. There is no consensus at all what the essential statements of the Kuhnian theory are, let alone any agreement about their validity. It does not even seem to be clear what the subject matter of the Kuhnian theses is: do they belong to epistemology, to philosophy or to sociology or to history of science, or to a philosophy of history or even to a philosophy of historiography?

One of the controversial aspects of Kuhn's theory is the question whether it is an idealist theory and if so, in which sense precisely. With regard to the focus of the contemporary discussion in philosophy of science, this is undoubtedly an important question. Nevertheless, as far as I know this question has not received its due attention in the literature. Of course, there are scattered remarks about Kuhn's idealism like Scheffler's characterization of Kuhn's position as "an extravagant idealism" (Scheffler 1967, p. 19). But I have not so far come across a fair and extensive analysis of the ontological position implied in Kuhn's philosophy of science. The reason may be that such an analysis is not easy to achieve since there are only very few explicit statements of Kuhn's about his ontological position. Furthermore, these statements are often fairly obscure and open to substantially different interpretations. Accordingly, what I want to do in this paper is to contribute to a clarification of the ontological position implied in Kuhn's philosophy of science. In particular, I want to answer the question in which sense the Kuhnian position is an idealist one.

At this point, I want to make a short remark that concerns the presentation of this paper. I have the impression that the words "idealism" and "idealist" are, despite their length, approximately four-letter-words in many quarters, especially in contemporary Anglo-Saxon philosophy. In my presentation, however, I am assuming—perhaps counterfactually—

that my audience consists not predominantly of philosophers of that kind. In other words, I am assuming that idealism is not utterly absurd *a priori* but just one theoretical option among others. Whether it is an acceptable option depends, of course, on its precise characterization and on arguments. A paper directed mainly at philosophers that are hostile towards idealism in principle would have to be quite different from the present one.

The outline of my paper is the following. As a starting point, I will briefly discuss the concepts of world Kuhn uses in his *Structure of Scientific Revolutions (SSR)*. Then I will sketch a reconstruction of Kuhn's theory of world constitution that he has developed in outline from the late sixties on. Next, I will ask in which sense this theory is idealist. Finally, I shall discuss some serious problems that face Kuhn's position.[1]

2. Worlds in Kuhn's Structure of Scientific Revolutions and World Constitution

In *SSR* an ambiguity in the use of the term "world" can be found that Kuhn does not notice. In the first sense, the term "world" means a world that is "already perceptually and conceptually subdivided in a certain way" (*SSR*, p. 129). It is such a world to which we actually have access, be it in everyday life or in science. We can perceive and describe such a world, and in such a world there are ducks, lecture halls and electrons, for example. Such a world has a certain conceptual structure, for instance the categories just mentioned: ducks, lecture halls, electrons. Now Kuhn got the impression—in the course of his research in the history of science— that these concepts are of human origin, i.e., *we* impose a structure on the world by means of these concepts, and that we do *not* read off these concepts from the world itself, as a more familiar story wants us to believe. Although it is not possible to impose any and every structure on the world, clearly more than just one is possible. This is shown by the historical change of these conceptual structures. Therefore, as Kuhn puts it in *SSR*, paradigms—whatever they are—are constitutive of a perceptually and conceptually subdivided world (*SSR*, pp. 110, 125). Expressed in more traditional terminology: the subjects of knowledge contribute to the constitution of the objects of knowledge (by means of "paradigms") insofar as they structure the world of these objects.

The second sense of the term world in *SSR* is obtained by asking what is left if one subtracts all these human contributions, all this perceptual and conceptual structuring from the world in the first sense. Then one is left with a world that is completely independent of our perceptions and conceptions, a world—as one might say—that is purely object-sided, whereas the world in the first sense is also subject-sided by its origin. But we have, according to Kuhn, no access whatsoever to this purely object-sided world. This world bears, of course, great similarity to Kant's thing in itself although it is not identical with it. Correspondingly, the other world that is conceptually subdivided has great similarity to Kant's

"totality of appearances," the "object of all possible experience." I will call it a "world of appearances."

As I have said, Kuhn does not notice the ambiguity in his use of the term world in *SSR*, and this impairs his own understanding of his theory, mainly his characterization of scientific revolutions as changes of the world (e.g., *SSR*, pp. 111, 150). As long as the concept of a purely object-sided world and the concept of a world of appearances are conflated, one can indeed not understand what it would mean to say that the world changes through a revolution, let alone how to argue for this assertion. This assertion can be understood only when it consciously refers to a world of appearances. Additionally, one should at least know in principle how the subjects of knowledge contribute (in a potentially variable manner) to the constitution of a world of appearances.

Kuhn's theory of world constitution aims exactly at answering this last question: how do the subjects of knowledge constitute their world of appearances? I hasten to add that this theory cannot really be found explicitly and fully worked out in Kuhn's writings. In fact, it is a reconstruction that I am presenting, a reconstruction that uses various hints of Kuhn's and tries to build from them a reasonably clear and coherent theory (these hints can mainly be found in Kuhn 1970a, 1970b, 1970c, 1979, 1981, 1983a, and 1983b). I can present this theory here only in outline.

Kuhn investigates world constitution by considering the process by which a member of a certain culture gains access to the world of appearances that is characteristic for that culture. This culture may be a certain tradition of normal science, for example. In other words the question is: how is a historically contingent structure of a world of appearances learned? The core element to be learned for world constitution consists in similarity relations that hold in the respective world between objects or situations that are classified as similar. These similarity relations are learned by pointing at exemplars of the respective similarity class, and by assigning them to the respective class. Additionally, members of neighboring similarity classes must be pointed at, and their membership in the original class be denied. (The exemplary objects of those acts of ostension, by the way, are what the concept of a paradigm was originally meant to denote).

Such similarity relations are at once constitutive for perception, constitutive for some empirical concepts, and constitutive for the respective region of the world of appearances. To use a Kuhnian example: when one has learned the similarity and dissimilarity relations that hold between ducks, geese and swans, three things have happened at once. First, one has trained one's perception in a way that in the presence of the respective beasts one really sees ducks, geese and swans, and not just unidentified water fowls. In case one has simultaneously learned the designators of the respective similarity classes, that is the terms "duck," "goose" and

"swan" (in English), one has also learned the use of those concepts. Finally, this region of the world of appearances—the water fowls—has gained a certain structure, namely the said classification. Similarity relations hold a central position in Kuhn's theory of world constitution because of their threefold function.

The situation of the more theoretical concepts, like the fundamental concepts of the sciences, is strongly analogous to the situation just mentioned. Those concepts are also learned via certain similarity relations, typically between problem situations, and also in this case the respective region of the world of appearances gains its structure by the similarity relations.

3. In which Sense is the Kuhnian Theory of World Constitution Idealist?

"Reality" or "the world"—the way this term is used in everyday life or in the sciences—is thus, according to Kuhn, a world of appearances and not the world in itself. A world of appearances is a world into which contributions of the subjects of knowledge are incorporated, contrary to the first impression. The reason is that such a world is conceptually structured and that the specific structuring is not just prescribed by the world in itself but it is imprinted by the net of similarity relations.

In this way, the Kuhnian conception of reality seems to be strongly idealist since an everyday or scientific world is—to use the previously introduced terms—also subject-sided by its origin. But here, some additional remarks are in order since the appropriateness of the characterization of a theory as idealist depends strongly on the respective conception of idealism.

It would be a complete error to understand the Kuhnian theory as idealist in the sense of a widespread cliché about idealism. According to this cliché, idealism asserts that reality is, in all its aspects, the product of consciousness where by consciousness individual consciousness is meant. In this version of idealism, so-called real things are as real as objects dreamt about; they are completely at the will of the imagining subject, both with respect to their materiality and to their particular features. This popular version of idealism is, however, very different from Kuhn's conception of reality, and I will develop the main differences in three steps.

First, for Kuhn reality, i.e., a particular world of appearances, is indeed object-sided with respect to its *materiality*, that is, it is with respect to its materiality completely independent from any influences of the subjects of knowledge. It is emphatically not the case that the objects of such a reality are, with respect to their substance, the same as an imaginary winged horse. Objects of the latter kind disappear completely and thoroughly as soon as they are not dreamt of or imagined any longer

since they are, with respect to their substance, purely subject-sided. On the contrary, for Kuhn a world of appearances is a particular formation of the world in itself, i.e., the formation of something material. Thus, Kuhn's position is by no means immaterialist.

Second, besides the materiality of the world, also its *features* are not dependent on the will of an imagining subject as the popular version of idealism asserts. Although Kuhn rejects this form of idealism, he does not subscribe to the opposite extreme. This position would be a realism that states that the features of reality are not dependent on an imagining individual because these features adhere to the world in itself. In other words, this kind of realism states the following: since the features of reality are completely object-sided by their origin, they are not subject to the influence of thought; on the contrary, they are thoroughly given. Kuhn's positions covers a middle ground between these forms of realism and idealism which are as popular as they are rough.

In order to develop the Kuhnian position, let us consider the net of similarity and dissimilarity relations which is both the basis of the specific structure of a world of appearances and of the language suited to describe that world. Such a net of similarity and dissimilarity relations is the result of a historical process: the development of a certain language and a certain conception of reality that is embedded in that language. If it is at all possible to speak about the subject of such a process, this subject would be the respective language community, be this community a specific scientific community or a whole culture. Accordingly, the net of similarity and dissimilarity relations is the property, so to speak, of a community and as such, it cannot be influenced at will by a single individual. To use a parallel: an individual as such is unable to *change* the rules of grammar; an individual, by systematically breaking the grammatical rules, only *leaves* the respective language community but does not change its rules. Likewise, an individual by himself or herself cannot change the world structure that is inherent in scientific or everyday language. What an individual can do, on the other hand, is to *initiate* language change, but the prevalence of such a change in the respective community is fundamentally a social process. Therefore, the idealist element in Kuhn's conception of reality is—whatever its details are—not *individual* but *social* in nature.

Third. According to what has been said so far, Kuhn's conception of reality could still be thoroughly idealist in the sense that a particular structure of a world of appearances is completely independent of all influences that are object-sided by their origin. Although this sort of idealism would not be an individual idealism, it would still be an idealism in the sense that there are either no features inherent to the world in itself, or that these features play no role whatsoever for our conception of reality.

But in fact a particular net of similarity and dissimilarity relations is also determined by influences that are object-sided by their origin. The reason is that in the Kuhnian conception the world in itself provides a

resistance that makes it impossible to imprint on it every and any net of similarity and dissimilarity relations. But this resistance is not of the sort that it uniquely determines the net of similarity and dissimilarity relations that may be imprinted on the world in itself—this would amount to or at least approximate a realist position. The resistance owned by the world in itself shows up much more indirectly, in science predominantly in two situations. It shows up, on the one hand, if anomalies appear in the course of research, i.e., situations in which something happens that should not happen. On the other hand, the resistance of the world in itself shows up when after the appearance of anomalies one tries to modify the net of similarity and dissimilarity relations such that both the preservable classifications are preserved and the anomalies change into the expected behavior. This requirement, which is typical of revolutionary situations, is extremely difficult to fulfill but it makes science in the crisis state so extraordinarily thrilling, difficult, and exhausting. If there were no relevant resistance of the world in itself, all that would count in a revolutionary situation would be the social success of the winning theory, independently of its scientific quality. A consensus in science would then essentially be the same as an accidental consensus in a madhouse, which is certainly not Kuhn's conviction.

Therefore, in a net of similarity and dissimilarity relations elements that are object-sided by their origin are united with elements that are socially subject-sided by their origin. But these essentially different elements cannot be *separated* in a particular net although they can abstractly be *distinguished*. The separate elements, or rather *moments* in Hegelian terminology, which are either subject-sided or object-sided by their origins, cannot be localized in a particular net of similarity and dissimilarity relations. The net is an amalgam, as it were, of the subject-sided and the object-sided, a dialectical unity of opposite moments. Accordingly, we cannot subtract the elements that are subject-sided by their origin from a world of appearances, in order to take at last an undisguised look at the purely object-sided, at the world in itself, at absolute reality. On the contrary, the features of the world in itself are inaccessible to us. Although we feel these features in the resistance that the world in itself presents to our quest of knowledge, but we are unable to describe these features as they are in themselves.

4. THE PROBLEM OF THE POSITION OF THE ANALYST

So far, I have tried to clarify Kuhn's positions with respect to his conception of reality. In the remaining section, however, I want to draw attention to a serious problem inherent in Kuhn's theory of world constitution. It can be called "the problem of the position of the analyst," and it has important parallels to similar problems that have repeatedly surfaced in the history of philosophy.

A theory of world constitution is called for, I have argued, if one wants

to make sense of the thesis that the world changes in a scientific revolution, and if one attempts to produce arguments for that thesis. But what has brought Kuhn to this strange talk about world changes in revolutions? His motive is his experience as a historian of science from which most of his philosophical intuitions derive. If one scrutinizes the scientific practices of the past, one finds that in many cases these practices make much more sense if one assumes these scientists have indeed worked in a world substantially different from ours. Yet this other world is not totally different from ours and therefore not totally foreign to us, but at some characteristic points it differs from ours. For example, there was phlogiston in the world of chemistry before the chemical revolution, the Ptolemaic planets revolved around the earth and so on. But in which sense "was there" phlogiston in the world of pre-revolutionary chemistry? Well, it was there in the same sense as there are electrons in the world of today's physics, or there is evolution in the world of today's biology. That means, roughly speaking, that there are theories that describe and explain these entities and processes, that—to different degrees—these entities and processes are subject to experimentation, that they play an essential role in the explanation of diverse phenomena, and so forth. But such a role in a given science, even if played extremely successfully, does not guarantee that later generations of scientists will believe in the same entities and processes, and this holds for past science as well as for present science.

The obvious consequence is this: if one sets out to discover the scientific past in as undistorted a way as possible, then one is well advised not only to "bracket" one's own idea of reality (Husserl) but to question it, and to open up for different ideas of reality. Otherwise, there is the danger of projecting one's own idea of reality into the past and blocking thereby access to possibly different ideas of reality. The situation is analogous to ethnocentric anthropology or to presentist historiography, which miss the essentially foreign. In particular, the abandonment of one's own idea of reality seems to be an indispensable methodological postulate for even entertaining a general theory of world constitution. The reason is that the theory of world constitution aims to understand the constitution of worlds impartially, that is, unbiased by any particular idea of reality. Therefore, no elements may enter this theory that originate from the specific world of the analyst: they would destroy the theory's intended impartiality that must prevail with respect to various ideas about reality.

But this postulate apparently cannot be fulfilled. At least in the Kuhnian theory of world constitution, a host of assumptions are used that can be justified only with recourse to the specific world of the analyst. Many of these assumptions are of an anthropological nature, namely, assumptions concerning cognitive abilities of human beings. In particular, assumptions are made with respect to the abilities to perceive, to understand ostensions, to form concepts, to communicate, and many more. These assumptions are a necessary part of the theory of world constitution,

since this theory must assume that the subjects of world constitution *have the abilities necessary to constitute a world*. But to gain knowledge about the subjects of world constitution means to treat them *as objects belonging to one's own world*, and this implies the use of substantial parts of one's own idea of reality.

As a result, the attempt to construct a general theory of world constitution leads to the uncomfortable situation that the means needed to reach that goal also render its attainment impossible. The attempt to analyze the constitution of reality in an unbiased way, independently of one's own idea of reality, seems predestined to fail because one has to use one's own idea of reality—otherwise one never gets started. Once one gets started, one must necessarily fail.

I must admit that I don't know what to do in this methodological situation. We may have learned with difficulty how to live with the fact that the one true religion or the one true culture—one's own, of course—does not exist. It may be, though I am not saying that it is, that also the idea of the one reality—the one we are used to, of course—must be abandoned. But the learning process required here will not be an easy one.[2]

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NOTES

1. I will keep the references to Kuhn's writings to an absolute minimum. Extensive and detailed references can be found in Hoyningen-Huene (1989) on which the present article is based.

2. I wish to thank Tom Rockmore for a careful reading of the manuscript and for valuable suggestions about the English.

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