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INCOMMENSURABILITY, SCIENTIFIC PARADIGMS AND CHANGES IN THE WORLD

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ABSTRACT

Kuhn always purposed this problem that the changes that had occurred in the world were all based on scientific revolutions. He based this theory on different subjects and paradigms, and most importantly, part of his philosophy, which is incommensurable. We want to tend to this issue in this article, that do changes actually take place in the world or in our own minds, according to Kuhn and other philosophers. Also, the change and incommensurability are understandings that can be added together. In addition, with attention to different scientific paradigms, will they cause new normalcies in the world? Kuhn speaks of Kanti's approach to the old conditions of the World and the changes in it. Our purpose is to discuss Kuhn's view about this issues and issues surrounding it.

From the results gathered in this article, we can say that after the changes in the paradigm, scientists are faced with a changed world instead of assuming that the world is steady and our world views have changed. It is better to say that the world has changed, based on economics and common knowledge, it is required that we say the world itself, has simply changed.

Our research style is analytical and in it we take apart and analyze the work of the scientists and philosophers in respect with changes in the world about the paradigms.

Keywords: Incommensurability, scientific Paradigm, Sensory Drive, Changes in the World

INTRODUCTION

In his book, "The Structure of Scientific Revolutions", Kuhn, in 1962, claimed that history is a sign for science and scientists living in different scientific paradigms don't

understand one another completely. Although they are using single phrases but since they have different understandings of these phrases, they cannot communicate with one another. Kuhn names this phenomenon, "Incommensurability of Scientific Paradigms". For example, in physics, Newton's Law paradigm is different with Ducati and both differ from paradigm of Archimedes. Or in chemistry Lavoisier's paradigm is incomparable with Priestley's. **(Kuhn, 1962, 1970. Pp. 50-147)**.

Apparently, if we claim Kuhn's interpretation to any of the subjects above, we encounter a problem. For example, if we utilize change as if it means change in a picture and our understanding of the world, this claim will be without substance as some commentators have called it. It is clear that after a revolutionary change, our understanding of the world will change too. This, also, will not agree with other Kuhn's claims. He has claimed, many times, that the paradigm changes shouldn't be reduced to just the scientists of the world's interpretations. It isn't as if the scientists of different paradigms would have different interpretation of similar objects. For example, we ought not to say that Aristotle and Galileo saw the same thing, meaning a pendulum, but had a different interpretation of it. But if we say that Kuhn meant that the change is in the world itself, then those who are against the world change approach, propose two very important problems. First, how could change in opinion cause change in the world? Another words, how could change in language (ideas, laws…) cause change in outer nature? This claim seems to be quite unwitnessed and unwarranted. Secondly, worldly change, with proof of sensory drives, that Kuhn has accepted, is in conflict.

We defend this worldly change approach with the change in paradigm throughout this article and will compare it with Kuhn's writings. We will answer the two questions mentioned above.

1. **Paradigm and its relationship with science**

   Paradigm is a collection of coherent tradition of scientific research in a set time period, where opinions, rules and regulations to solve problems, laboratory tools and so on, are encapsulated. Such is tradition of Copernican Astronomy and Aristotle or Newton's Dynamics.

   Scientific paradigms are accepted general achievements that make resolving the issues practical for the population, for the time being. (Kuhn, 1962. X) In other words, in Kuhn's

beliefs, (1973) the basic unit and the infrastructure of every analysis is the scientific society and its expert teachings are the reason for connecting the members of the said society. These are also sound teachings to prior scientific achievements. Any specific scientific society who deals with a specific expert science, notices certain achievements that can be used as its original, continuous research. This achievement or success, is what Kuhn refers to as "paradigm" and research which is firm on basis of this paradigm, he calls "Normal Science". Using different wordage, in result commitment and adherence, it turns into a collection of "laws", paradigm, opinions, methods, and criteria that can be successful in solving scientific problems. As a result, it will be the foundation for new method of thinking for future problems. Kuhn believes that paradigm has to be limitless, open, unrestricted, and at the same time be successful. Therefore, paradigm meets a certain self-confided quality. Paradigm cannot altercate with its own principals and foundations, nor can it challenge them; or dismiss them. Therefore, normal science or researches based on paradigm, try to solve problems and start thinking about new interpretation or in another word, it falls out of paradigm; but stays away from any serious and new basic method.

Accepting common sensory stimuli

Kuhn, following a writing in 1969, added in his book, "Structure", he accepted the presence of "common sensory stimuli" and tried to adjust his realistic position. He specified that now, the presence of common sensory stimuli between humans, are somehow certain and acknowledged that this subject does not work well with the phrase, "The world will Change", which has been used quite a bit in the title of the book. He emphasizes the role of formation of scientific knowledge, following the philosophy of Kant. But his saying differs from those of Kant in two ways. First, that they are different and historical, second, they don't determine the possible experience. He leaves the experience to a real world-wide understanding here and writes:

"These sayings constitute a limited collection of possible experiences and it is possible that they are somehow comprehensible in a real world and possibility of achieving it is experience. Now, the fact that which of these

comprehensible experiences occur in that real world, it needs to be learned, from daily experience and from modified experience and a beneficial system, which is a sign for scientific activity". "**ZibaKalam, 1390)**

However, upon speaking of common sensory stimuli, he brings up constraints and limitations that neutralizes these stimuli or at least weakens them, in defense of realism. For example, he immediately emphasizes that such stimuli are very theoretic and abstract and the stimuli themselves cannot be experienced. Of course, he has no doubts that human beings have feelings that are experience worthy, but we have not reason for their similarity. He uses color blindness as an example and claims that a color blind person receives steady stimuli and is no different from other humans. He differs because he feels different receiving those same stimuli. Even though Kuhn considers the existence of the stimuli and their uniformity as two different theory that cannot be denied, at the same time, he emphasizes that "our world, at stage one, isn't filled with our stimuli, but with our feelings". (Popper, Aram Translate, 1374) Stimulus is not a common and fixed order and can change with teachings and brain training and Kuhn reasons that if two societies get two different feelings from one constant stimulus, then in one meaning, they still exist in two different worlds. He could have easily said that the stimuli that enter the brain from outer world, could lead to different world views with brain training. But Kuhn's persistence in emphasis that there are different worlds is quite meaningful.

Accepting a world independent of mind

Even though Kuhn in his book, "Structure", reinforces antirealism and anti-relativism, but in his second round of thoughts, he tried to explain the accusation of relativism and his answers are such that, even at times, it has been claimed that the "second Kuhn" is defending realism. Kuhn believed that relativism accusation is solely coming from philosophy and this accusation is due to the fact that he is thought to be a philosopher. This is at the time, when he called himself a modest historian. Of course, the "second" Kuhn would even become angry and would say: "Others confront me as if I am stupid! This is a bit destructive and recently I stopped reading about myself, especially those writings from philosophers, because it angers me. I know that I cannot answer. It disturbs me when I want to read them and I through them to the corner of the room and leave them unread. Due to this anger, whatever that may be useful in these writings, I lose. This is painful." **(Kuhn, 1970-1993, p 315).**

To understand Kuhn's position in "independent world from mind", the best source is a book he was working on at the end of his life. Although this book was never completed and published, but he reported some of what this book contained. He explains about the contents of this book that this book talks about the problems of his other book, "Structure", and it's main topics are; rationality, relativism, and specifically realism and truth. But still the main volume of this book is specific to incommensurability. He says, "Because no features of the book Structure, from the time I wrote it and the thirty years since, has occupied me this deeply and I feel stronger than ever". "Incommensurability has to be a necessary part of every historical viewpoint that can be evolved or be revolutionary in doorway to scientific wisdom." (Ibid, p. 91) So, Kuhn the Second, even when trying to defend truth and realism, still assigns the context to incommensurability and even says, "To defend understandings such as truth and awareness against, for example, postmodern excessive movements towards incommensurability is necessary". Incommensurability's contrast with truth and its role in this understanding in reinforcement of the postmodern movement isn't a subject hidden from anyone. Therefore, the question comes up that how could Kuhn defend truth and wisdom while leaning on incommensurability, going against postmodern extremists?

In order to get more acquainted with Kuhn's method, first we talk about an article from "Problem Historic Philosophy of Science". Perhaps the most explicit and longest phrase of his in defending realism, and then we tend to constraints that Kuhn mentions in the next paragraphs and is successful to revert this phrase to the most explicit phrase in anti-realism. The argument is that world structure can be experienced and this experience is reflected in language and Kuhn explains that psychology and mass teachings also are visible in building a language. Therefore, the members of two different societies, meaning bilinguals, experience world's dimensions, in two different methods. He, answering the question, "Can we claim that the world is dependent to the mind or even is made from the mind", writes;

Such expressions contain this claim that the world depends on the mind or perhaps innovation or built of beings that live there. In recent years such claims have been followed vastly. But metaphors of innovation, build and dependency of mind are devious in two ways. First, the fact that the world is not invented or built. The beings claimed that this

responsibility is theirs, in fact have found the world to be already existing. The introductory role of the world is in their birth and then their gain of experience. This view shows that the world is very mean: it pays very little attention to the observer's hopes and desires; it is completely prepared to offer evidence to go against the innovative possibilities that it does not agree with the world's behaviors. Those who are born in this world must consider the world to be already found. They could, certainly, interact with the world and change the world and themselves along the way, and the residing world that changes like this will be found like that for the next generation. A world that changes throughout time and from one society to another can it still be called a real world? I don't know how one could deny this world's right to be called real. Such world is an environment for any type of society and individual life and it will apply exact limitations. In order for a society or individual to last, these conformities are a must. In a modern world scientific activity is a primary tool for this conformity. What can be reasonably expected from a realistic world?"

What can be expected more from a true realist? These subjects have to be true to a point that some of Kuhn's responders have accused him of defending a raw realism and somehow Kuhn speaks of an outlook of a "God", which can only be found in words of the philosophers of middle-ages. **(Goldberg, p.740,)** In fact, Kuhn, in a way, speaks of a given world that in a reader it creates an expectation he exists and has given this world. Kuhn, at the same time takes the reader to the summit of realism and all of a sudden, in an excursion, throws the reader into an abyss of anti-realism. Since this world is an environment built by scientific society and if we don't identify it as dependent on the mind, the reason is clear, a mindless scientific society. Kuhn in this argument first, cleverly, talks about the reasons why an outer world exists. This is to disarm the realists and organize own anti realistic views so it would work with this reasoning. The question realists raise is that if the world is made by human hand, then why does it not behave in human's favor? Kuhn's answer is that the world built by a population, is not necessarily in accordance to individual.

Kuhn continues his argument with this answer that what is the purpose of compatibility with the environment? "Do creatures adapt with the world or the world adapts itself to the creatures?" In biological evolution, those creatures survive who can best adapt with their environment. Kuhn also adds that every

environment is identified with the population who lives within it. Of course, the argument is not simply in identification and Kuhn in follow up, without any proof, a claim that in biology an environment is built of population that live in it. "An environment, independent of society that is compatible with it, does not exist." In biology, an environment is consists of a group who live in it and therefore, build that said environment. In conceptual theory, world is a reflection of our environment. The role of world construction, which is a reflection of the mind, it goes back to a theory that my exclusive look during evolution has been extensive and long. Compare my first document about excursion, observation, understanding and etcetera. This has been the specialty of my research that more than anything has created this perception that I consider the world to be dependent on the mind. But the metaphoric world related to mind, like its sibling the constructed world, is deeply misleading. It is the groups and group activities that make up the world (and are made by the worlds) have ... and groups have no mind[i]. "

Kuhn discussed in this argument, using techniques such as vague writing, sputum science and ideology, false conceptions of science, which is more common in postmodern literature, without charge to their notice, guides the reader to the desired position. He discussed in the literature in Darwin's framework plan to convince the reader that his position is achievements of modern science and opposition to it outright opposition to scientific expertise. While the scientific community with the biology of the species, which is Darwin's biology subject, are not comparable and their sputum sentences is a misuse of the provisions of the new science. This discussion method is rooted in Marx claims that Darwin set the biological foundation for economic class warfare. But even Darwin himself did not agree with this interpretation. While Darwin's theory is independent of the environment and the species is derived from environmental groups that already existed. However, relying on Darwin's literature made it possible for Kuhn to state the metaphorical world of uncertainty and introduces the work of human societies. Without defending the independence of such world, he denies dependence on mind only, with the argument that societies have no mind. But communities do have a language. Is such a world independent of languages? Kuhn has no intent to give a clear answer to such questions. While he speaks in a space that next to idealists claim that world depends on the mind of the individual. This idea has plenty of supporters that there is a collective

language-dependent world. In such a context as Feyerabend says, Kuhn's ambiguity is intentional and its purpose is to influence the audience. He convinces the audience with this method that even in experimental science there is an idealistic attitude prevailing and finally comes to the conclusion that the object itself is not required. "The viewpoint that I belong to is Kanti's, but without this object and with categories associated with the development of adaptation that can over time change the language and experience." "**Kuhn, p 207)**

Change in the world as a paradigm shift:

Kuhn uses in categories or vocabulary with common sense. He suggests this feature classes with the "types" of traits. For "types" he uses a variety of spectrums, such as: Natural types, artificial types, and social types and etcetera. (**Kuhn 1991, 62**) In his opinion, there are two basic characteristic of this terminology, linguistic and non-overlapping.

The first feature separates words indicating the category of proper names and definite descriptions. The second feature, instances of each category has only affected the same category. "You cannot have any overlaps between the two instances, unless they are linked goods. No dog is a cat and no golden ring silver. This causes dogs, cats, golden and silver rings, each one, are a type.

Categorization of objects has to do with classifications of objects and the world. Kuhn says a different linguistic community has a linguistic structure and categorization structure, the different linguistic communities, categorizes the world differently, meaning that it has different categorized structure. **(Kuhn 1983, p 52)**.

Since a paradigm consists in a linguistic community, what happens during the paradigm is that the structure of the past categorization (though not all) falls apart and the scientists of the new paradigm, categorize the world in a different way. Many of these changes at once, and occur in a perceptual gestalt. Changes in the paradigm's structure of categorization can be problematic in a variety of ways. It is possible that a category may be entirely eliminated or a new category be created, like "Phlogiston" the transition from Priestley's chemistry to chemistry of Lavoisier, and the moon in the transition of Copernican astronomy to that of Ptolemy. It may lose its previous instances of a category and discover new instances of the new paradigm. For example, the issue of the components of the objects before the chemical paradigm of Boyle was consistent of four elements: earth, water, air and fire, but then instead protons and neutrons replaced those four elements. It is possible that

instances of a category increase or decrease, like category of motion from four types of Aristotle's physic to another form, meaning local motion of Newtonian physics. Maybe some instances in a different category to the category of a paradigm shift in the paradigm of competition…but back to the question of changing the world and the questions we mentioned in the introduction **(Kuhn, 1991; p 104)**.

First, let's tend to the explanation of the issue. As it was pointed out, scientists will categorize objects and world position after the revolutionary change. This is not very accurate, it is more accurate to say that new scientists, in general, do not categorize objects as previously done, but categorize the same sensory stimuli different shapes. To assume this claim is basically that overlap we talked about. Since categorization structure changes after the revolutionary change, new paradigm objects are not necessarily the same objects of the old paradigm. Still, there is nothing wrong with saying that they both received the same stimuli. An important point is that sensory stimuli are not the same objects since sensory stimuli alone cannot be considered an object. A thing is called when an object when it is at least different from other things that actually matter and that is possible when we have material and type or the same category.

Although the scientists' sensory stimuli are identical competitor paradigms, it doesn't result that they look at the same objects. Object building and building categories occur in a sensory world not in world of sensory stimuli. In other words, it connects Kuhn, Darwin and Kanti together and it can be said that sensory stimuli is nothing unless it passes through structure and biological filtration theory (paradigm).Only after this transition, one can speak of objects, differentiations and their similarities and therefore types and classes. The difference between Kuhn's categorization to those of Darwin and Kant is that Kant used to identify these categories as permanent and fixed but Kuhn (and of course Darwin) believed that a scientific revolution can change things.

Now we discuss changing the world in intuitive and non-intuitive.

In our belief, Kuhn's claim about the change in the world is entirely consistent with our intuitive common understanding. How do we talk about the change in the world in our everyday language? When a species becomes extinct, we claim to transform our world; we would say that this is a different world than the one which contained that animal. Exactly in the same sense, a world

with oxygen is different from that world where Phlogiston is absent. When the leaves turn yellow, we say trees (another word, world in a sense) has changed, if we had evolved somehow, where we couldn't differentiate yellow from green (for example we would put yellow and green in the same category) we would have probably said that the leaves are always green and do not change. Change in the world is completely in accordance to our categorization; otherwise, it is not clear what meaning change could have. Building the neural category and paradigmatic structure, gives us the ability of resemblance and differentiation, without this order, there is nothing but sensory stimuli. Without looking at establishing similarities and differences, is not looking at the object or to a class of objects and not as Kuhn says looking at a world. **(Kuhn, 1976, p 171)**

The difference between categorization structure, meaning difference in world, those creatures that have the building of different categorization live in a different world and this, perhaps, is close to our common understanding.

The problem that arises here is that is there a way to prove or show that which world is real and which is imaginary? Is Newman's world the same as the Copernicus or Ptolemy? All the incommensurability is that there is no such path. Through rational argument and empirical scientists cannot prove such a thing. Their categorization structures are different. Therefore, in order to prove their word, the scientists of a paradigm may have depended on an object phenomenon that an opponent doesn't exist in the world of scientists and therefore their claims are not an illusion. If we consider Kuhn's claim with Kant-Darwin approach it is understandable why the historian of science, when studying science, we will be tempted to say that the world has also changed after changing paradigm. **(Sharifzadeh, 2014,p 12)**.

CONCLUSION

In this paper, Kuhn's views on the changing paradigms were examined. He postulated that the world changes consequently, due to a prey paradigm. Against this view, there is another approach based on Kuhn's aim to change in the world was a mere change in worldview. The mentioned group argued that change the changed world by changing the paradigm is unjustified and intuitive in one direction; on the other hand, it is not consistent with Kuhn's stable sensory stimuli.

Problems and conflicts in question were tried to be answered in this research and demystified that the world is not a world of sensory stimuli, but a world of feelings. Hence the claim that the world is in conflict

with the stability of sensory stimuli are not accepted.

By changing the world of categorization of objects and its phenomena changes the world. This change in categories, will change objects and world's relationship, without speak of sensory stimuli. This means that in the world some categories can be removed and added and some even have their application change. In other words, formation of categories allows the organisms so we can see similarities and distinctions in them. When the formation falls prey to change, then change in categories and their layout will also be changed and consequently the difference and similarities will also change. So, when we speak of change in world, common intuitive view says the same thing. For example, if we imagine that someday black color of night changes to another color (eg, pink), two questions will be proposed: One would be that the world has been subject to a change and black color has turned into pink or two, the change has only occurred in our vision of the world not in principle and essence of our world. Although the latter is also reasonable to believe to be true and it is possible that the nervous systems has suffered a transformation, but the first is more intuitive because before we relate transformations to ourselves, we impute them to the world around us. But how capable is this possibility to determine how much our common beliefs play a role? It seems that our common interpretation ignores such views. We are claiming that black is the color of night, though in reality it is possible that the color black night or the color of night not even a subject. Due to a possibility, a common understanding, does not deny the concrete reality because its access to the world is only through the one thing that it sees or understands and Kuhn's savings is this same thing.

As long as their access (the scientists) to the world is what they see and do, we can believe that scientists encounter a different world after the revolution. After a paradigm change when scientists are faced with a world that has changed revolution, rather than rely on the assumption that the universe is constant and only our world views have changed, (the black color of night hasn't changed but our imagination has) basic economics and common sense require us to say that the world itself, simply has changed (simply put, the black color of night has changed). **(Kuhn, 1389: p 145)** Therefore, when the paradigm shift occurs and scientists, like the example above, face a different world, the economic principal and common sense requires us to say that the world, simply has changed on its own (black color of night has changed)

instead of saying our perception of the world has changed.

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