Thomas kuhns scientific revolution philosophy essay

History, Revolution

We cannot overemphasize the importance of development Science. Most people were ignorant of this critical subject till the works of Thomas Kuhn came to be heard off in the 1950s and 1960s. Thomas Kuhn was an American historian and philosopher and was born in 1922 in Cincinnati Ohio. He became one of the most influential philosophers of science in the twentieth century and his book the structure of scientific revolution is one of the most cited books of all times. His work on philosophy science inaugurated the history and revolution of science. One thing was common with his works, they were extremely influential.

His theories inspired many philosophers and most of them have quoted Kuhn in their works. One of his popular theories was the development of science which he divided into three phases; Pre-paradigm phase, normal science and paradigm or revolutionary or mature science. Different paradigms may compete to gain confidence in the community. However, there is no standard way of measuring viability of paradigm and this was called incommensurability. Kuhn acknowledges that problems are inevitable and they give rise to what he called crisis in the development of science. This paper will evaluate Kuhn’s notion of scientific revolution particularly paradigm, normal science, crisis and incommensurability.

Kuhn believed that a mature science must experience interchanging phases of normal science and revolution. This theory is what he called paradigm. According to him, normal science has its multidisciplinary matrix constant or fixed with its values, theories, instruments and metaphysical assumptions constant leaving a puzzle to be answered. On the other hand, revolution

science has its theories, values, metaphysical assumptions and instruments revised to provide solutions to existing puzzles and providing solutions to much complex puzzles that may arise (Bird, 2004). Other sources have different perspectives on Kuhn’s idea of paradigm. Nevertheless, all the sources have the central idea of Kuhn’s idea of paradigm.

Kuhn provided many meaning of the word paradigm. The most widely used meaning is that which is shared by members of scientific group only. He postulated that a paradigm has to be explicated when the scientific community recognize it as having independent existence. To be able to proceed effectively, we have to know what a scientific community is. According to Kuhn, a scientific community is that made of practitioners who have speciality in science. They are bound together by their education, knowledge, skills and shared goals (Suppe, 1974).

All in all, most people even those who are not involved with philosophy understood this concept practically well. He believed that paradigm should centred on a recognized achievement that has puzzles, creates a traditional on experimental grounds, and renders a set of repeatable and standardized of some theories from other sources, must be of successful scientific practice, must have a network of methodological commitments, has worldview of metaphysical and should not have the same theory as past sources. Kuhn believed that each theory was different and ought to be treated differently because of the varying factors and characteristics (Klee, 1952).

According to Kuhn, each theory has unique attitudes towards any kind of data and has a distinct world view. He continues to acknowledge that each theory has its own puzzle’s or problems and solutions. Kuhn argues that before paradigm, the research has to undergone a pre-paradigmatic stage of science. This is because the field of science is usually unstructured and is basically done through random fact gathering. While working in this pre-paradigmatic field, it is not know what data is important or relevant due to the nature of science. Facts are investigated to determine what is important and relevant and what is not. Once findings have been done appropriately, then paradigm is arrived at. Kuhn commented that paradigm fix the fundamental principles of that particular domain and research not need to be done further. He argues that the paradigmatic facts need to be taught to the succeeding generations (Klee, 1952).

Normal science is another aspect that Thomas Kuhn proposed. According to him, a discipline must have a single consensus in respect to a single paradigm. Transition of science is realized during the pre-paradigm science where during competition. Any theory that is to be a paradigm has to be better than its competitors arousing the attention of the professional community. This achievement must be sufficiently unprecedented and must be open ended to leave look for solving any problems that are encountered. This paradigm has to gain the community’s confidence by promising to solve any problems that maybe encountered in detail and precisely. Once the community gains confidence in this particular paradigm, the community will be committed towards the paradigm (Marcum, 2005).

Paradigm or normal science is different from the pre-paradigm in that it is rigid and highly directed unlike the pre-paradigm which is flexible and not directed. Because of these factors, normal scientists are encouraged because they are able to turn around their restrictions and have confidence instead. Through this, the scientists are able to investigate even unimaginable things in detail and depth. Normal science explores new areas from which it solves some critical problems that the community is faced with. This science promises to solve all other problems that the community faces as well thereby gaining confidence from the community.

One major characteristic of normal scientists is that they are not out to make new discoveries. Instead, they use paradigm to be able to understand nature better and in much detail. These scientists work hard to prove the effectiveness of their facts and measurements. They do not use theoretical and observations in coining out paradigm but involve exploratory investigation and experiments as well. Like all other areas of research, normal science is faced with some experimental problems. These problems require innovation and technology to be solved effectively. Theoretical problems are inevitable in normal science and they can be solved using the techniques for solving experimental problems. Normal scientists carry out analyses which are aimed at matching theoretical predictions and experimental observation. The objective of this is to increase precision and scope (Marcum, 2005).

Though paradigms are expected to inspire and guide scientists, this not the case always. At times, paradigms fail to inspire and guide scientists. It is

through these anomalies that normal scientist is able to discover new facts and phenomenons. Kuhn realized this special period when the existing paradigm is unable to inspire and guide the community and called it crisis. During this period, the scientists and the community lose confidence in paradigm. Kuhn accepts that paradigm break down at times and he believes that this is a proper way of functioning in normal science. Normal science can cause its own destruction but only in response to right stimulus (Smith, 2003).

The right stimulus in this case is the underlying problems which are deep and not superficial. Though a paradigm does not break down easily, it eventually breaks down when problems persist, when the right stimulus comes along. There are several other perspectives in which crisis in normal science is looked at. At this particular time, scientists and the community lose confidence in the paradigm. Members of the community may try and solve the crises affecting the paradigm. However, there are many theories of solutions proposed by the people in the community. These varied solutions may lead to possible crisis before a suitable solution is coined out.

The balance of normal science between resistance to change and not being resistant at all is one of the major secrets of science. Crises are inevitable in most fields apart from science. We have to appreciate that; were it not for the many failures in science, science would not have evolved appropriately. There would be no revolutions in science if this was the case. These basic ideas and challenges about balance in science are very important. They help science work in the best way possible. Solution to crisis can be achieved in

one of the three ways; the anomaly can be resolved and the paradigm restores its normal science practice, the paradigm is replaced by a new paradigm and thirdly the anomaly is not resolved till further research, investigation and analysis is performed (Marcum, 2005).

Incommensurability is a mathematical term meaning lack of common measure and was first coined Thomas Kuhn and later adopted by other philosophers. Kuhn and most of these philosophers argued that there is no neutral way of comparing scientific theories thereby leading to incommensurability of these theories. However, the big question is how to compare competing paradigms keeping in mind that there is no neutral way of comparing these paradigms. He further argues that the only way to distinguish between these paradigms is by the choice made by individual communities. This is based on scientific progress which is driven by nothing other than mob psychology (Popper, 1969).

Kuhn acknowledged that revolutions have a non cumulative nature a revolution may either gain or lose some things. He was referring to the fact that a paradigm with puzzles may either cease to have questions or these puzzles may arise again. However, the question whether a revolution gains or losses arises. According to Kuhn, it is either we gain more than we lose or there was no revolution at all. This is especially so when there is no gain in the paradigm, there is no revolution of old ideologies and theories. There are variations between different paradigms because of the difference communication and different ideologies and arguments between the different paradigms. Kuhn appreciates that people from different paradigms

may use the same species or terms but the meaning of the term would differ in the two paradigms (Smith, 2003).

Kuhn’s work is one of the most inspiring in the field of philosophy and scientific revolution. The structure of scientific revolutions is one book that inspired many. However, as Kuhn puts it, reactions to the book are very varied. At some point he acknowledges that you can think that the people who interacted with book read different books. There were several mistakes with the book and the book got much criticism from many critics. Despite this, we have to appreciate that Kuhn’s ideas are embraced all over and he inspired the community in such a great magnitude.