TIME TO RETURN BACK THE SOUL OF SCIENCE TO DEAL THE PARADOX OF HUMAN MIND CAUGHT BETWEEN SCIENCE AND STUPIDITY

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The current human intellectuality and approach to knowledge is in strong ties with a kind of sheer stupidity. The paradox of educated and scientific mind has ripped science of its philosophy. Philosophy is the soul of every branch of knowledge.

Thinking scientifically we miss basic points important to philosophy of science. Besides its philosophy, we all know that science is a way of uncovering the truth or fundamental principles that govern nature. What evidence we find through scientific method is tentative than ultimate. Science is path to knowledge but we assume that it is the knowledge in the final and ultimate form. A path takes turns and may return to a previous point in search of a clear milestone. This is the most neglected concept in human information processing in scientific matters, hence the major stumbling block in the settlement of a clear and solid scientific approach. The current scientific approach is an orthodox approach that overlooks the basic philosophical assumptions of modern science.

It is time to return to the philosophy of science to better understand the situation human mind is going through specially in the crucial times of pandemic.

One of the most popular theory of science is pleaded by Karl Popper to assert that science should be testable, refutable and falsifiable[1]. Following characteristics must be present in science to differentiate it from pseudo science or non science.

Falsifiability is one those characteristics pertaining to the logic; for example to falsify the phrase *"All swans are white"* a single black swan is enough if one could only find that. Hence anything is falsifiable provided to be established with proof.

Logically this idea is represented by the inference rule "modus tollens" which follows the form:

If Socrates is a god, then Socrates is immortal
But Socrates is not immortal
Therefore, Socrates is not a god

The first line is called a premise, so that would be our 'theory' and 'prediction' and the next two lines are proving how that if the prediction is false so is the theory. Important to note that you can't prove that the theory is true; you can only prove that it is false in case of enough evidence.

Karl Popper's philosophy of science has this modus tollens logic at its core. If a scientific hypothesis can have this logic applied then it is true science, if not it is a pseudo-science. The process is a lot more complex for a scientific theory of course but follows the same structure.

This falsifiability cannot be applied in practice, it is just a theory, to apply this logic you need to use falsification. To test falsification, you need a theory which is 'testable' to determine if it can be proven false. For the above example if you see a black swan therefore all swans are not white.

Science is about falsification, not confirmation of a hypothesis. All the research done now a days follows this principle. All statistical tests make a research hypothesis, the statistical methods implied do not test these research hypotheses; all statistical tests make an alternative hypothesis exactly contrary to the research hypothesis and gather evidence to refute this alternative hypothesis, if this alternative hypothesis is refuted, it hints that research hypothesis is accepted.

Popper believed a good idea could be tested with the risk of being wrong, which lead to more knowledge than one which could not be tested but claimed to explain everything.

Essentially, we learn from our mistakes. Beliefs should change with gained knowledge, be tested and let it go if found to be unfalsifiable. These concepts differentiate science from pseudo-science. For example, Einstein's theory of general relativity proposed in 1916 and tested in 1919 was 'proper science' to Popper as it made predictions which could be wrong. Compared to Freud's psychoanalysis, which was applied to any circumstances to be true. Popper saw this and Marxism as 'improper science'. They suffered from universal verification and had no chance to be proven wrong.
The field of philosophy of science is evolving and changing. Thomas Kuhn explained the process of change in science. Kuhn looked at the history of science and argued that science does not simply progress by stages based upon neutral observations (e.g. Positivism). For Kuhn, the history of science is characterized by revolutions in scientific outlook. Scientists have a worldview or "paradigm". A paradigm is a universally recognizable scientific achievement that, for a time, provides model problems and solutions to a community of practitioners.

Scientists accept the dominant paradigm until anomalies are thrown up. Scientists then begin to question the basis of the paradigm itself, new theories emerge which challenge the dominant paradigm and eventually one of these new theories becomes accepted as the new paradigm. During different periods of science, certain perspectives held sway over the thinking of researchers. A particular work may "define the legitimate problems and methods of a research field for succeeding generations of practitioners."

Knowledge which does not evolve as per the four main phases, according to Kuhn, may not be considered scientific. The first phase

is pre-paradigmatic; it is a period before a scientific consensus has been reached. A time of disorganized and diverse activity characterizing a constant debate over fundamentals giving forth as many theories as there are theorists. No commonly accepted observational basis. The conflicting theories are constituted with their own set of theory-dependent observations.

This phase is followed by an established paradigm to lay the foundations for legitimate work within the discipline. Scientific work then consists in articulation of the paradigm to state problems of the day; it provides conventional basis for research and sets a precedent. Problems that resist solutions are seen as anomalies. Anomalies are tolerated and do not cause the rejection of the theory, as scientists are confident these anomalies can be explained over time. Scientists spend much of their time in the Model Drift step, battling anomalies that have appeared. They may or may not know this or acknowledge it. It is necessary for normal science to be uncritical. If all scientists were critical of a theory and spent time trying to falsify it, no detailed work would ever get done.

"Normal Science, the activity in which most scientists inevitably spend almost all of their time, is predicated on the assumption that the scientific community knows what the world is like. Much of the success of the enterprise derives from the community's willingness to defend that assumption, if necessary at considerable cost. Normal Science, for example, often suppresses fundamental novelties because they are necessarily subversive of its basic commitments"[2] (Kuhn, 1996, p. 5).

Paradigm precedes a phase of crisis where the paradigm shift occurs because anomalies become serious, and a crisis develops when the anomalies undermine the basic assumptions of the paradigm and attempts to remove them consistently fail. Under these circumstances the rules for the application of the paradigm become relaxed. Ideas that challenge the existing paradigm are developed. In crisis there will be 'extraordinary science' where there will be several competing theories. If the anomalies can be resolved, the crisis is over and normal science resumes. If not, there is a scientific revolution which involves a change of paradigm.

Revolution is the final phase where a new paradigm will be established, but not as a result of any logically compelling justification. The reasons for the choice of a paradigm are largely psychological and sociological as we are observing in case of current pandemic. The new paradigm better explains the observations, and offers a model that is closer to the objective and external reality. Different paradigms are held to be incommensurable; the new paradigm cannot be proven or disproved by the rules of the old paradigm, and vice versa. There is no natural measure or scale for ranking different paradigms[3].

Imre Lakatos reconciled the concepts of Popper and Kuhn to develop the philosophy of science further. Popper described science as progressing by a process of falsification; theories whose predictions conflict with experimental observation are soon discarded, and science progresses as a process of elimination. Kuhn saw this as an idealist view of science; a study of the history of science led him to view science as consisting of periods of 'normal science' in which experiment and theory are performed within a particular paradigm, with scientists holding on to their theories in the face of anomalies. Very occasionally, the reigning paradigm is overturned, but even when such a paradigm shift occurs, it is not based on reason alone because observation is influenced by the paradigm in which it occurs.

Lakatos suggested that in science, a 'theory' is really a succession of slightly different theories and experimental techniques developed over time that all share a common hard core; such a collection he named the research programme. Scientists working within a given research programme shield the core from falsification with a protective belt of auxiliary hypotheses. The question of whether a worldview is true or false is replaced by the question of whether a research programme is progressive or degenerating. A progressive research programme is characterized by growth, prediction of novel facts and more precise predictions etc. In contrast, a degenerative program is marked by a lack of growth; its auxiliary belt does not lead to novel predictions that are later verified.

Lakatos's idea of the research programme leads to a more nuanced version of Popper's falsifiability; instead of theories being summarily rejected at the first conflict with observation, science is now seen to proceed by continually adjusting and developing the protective belt around the hard core of a research programme; this is a systematic process that forms part of normal science[4].

Educated elite of the society and medical community is lacking behind in training of scientific theory and philosophy of science. This lapse has ripped science of its soul. The fundamental error that we commit in this regard is to rely solely upon the little knowledge scientific evidence produces as an ultimate and discrete truth which is irrefutable and not falsifiable only because it is deductive evidence. Ignorance to the philosophy of science has made science an irrefutable and ultimate form of truth in current scientific mind. The processes of science uncover the path to reality bit by bit; unless all the parts of puzzle are put together, picture of reality may not be identified yet in our fixed mind sets we rely upon the little bit as complete picture; this is the paradox of human stupidity and intellectuality. Scientific mind is struck in the mirage of absolute truth of science which only takes short turns and detours too in order to reach the destination. Its like a treasure hunt with out a map where you can only progress on the basis of cues and conjectures. Returning back the philosophy to science will illuminate the mind with this process and human mind might be disillusioned from the fundamental error of taking scientific evidence as irrefutable and unshakable to lend flexibility in our concepts and hence leading to more learning through a receptive mind. The philosophy of science must be taught to all the students that enroll in any area of science including medicine and surgery as well. It will not only help gear the research and scientific discovery in the local settings but also enhance our capability to address novel observations and a better explained clinical experience with the patients.

REFERENCES

1. Popper K .The Logic of Scientific Discovery. London/ New York NY; Routledge Classics. 2002.
2. Kuhn TS. The structure of scientific revolution. Chicago/London. University of Chicago Press. 2012.
3. McLeod S. Thomas Kuhn; Science as a paradigm. 2020. retrieved from https://www.simplypsychology.org/Kuhn-Paradigm.html.
4. Popper vs Kuhn; the philosophy of Lakatos. 2011. retrieved from https://antimatter.ie/2011/02/11/kuhn-vs-popper-the-philosophy-of-lakatos/.