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Reducing the 'Latency Period' for the Acceptance of New Scientific Ideas: Positioning the 'Latency Period' for the Acceptance of Scientific Ideas as an Indicator of Scientific Maturity

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Abstract:- There is often an inordinate time span from the time a new idea is gestated till it is widely accepted in scientific and in popular circles, with wide variations commonly observed across geographies and disciplines. This elapsed time may be referred to as the 'latency period' for the acceptance, or even a structured and a justified rejection, as the case may be, of new or novel ideas. This can be observed in most societies around the world, unfortunately even in more advanced ones. There is also a variation across geographies to the detriment of developing countries, and across disciplines to the detriment of various fields in the social sciences. Indeed, we have analyzed the possible root causes of all these in our paper, and all these must be systematically addressed, and new or other root causes identified. This would form a part of what some experts consider a "time crashing" technique. Reducing this latency period will lead to scientific progress at a much higher rate, or "Scientific progress at the speed of light" as we would like to call it. There are many ways to do this. The first would be to improve the education system on the principles we had laid out in our published paper on "Anthropological Pedagogy" and the "Sociology of science". The second would be to build a robust twenty-first century intellectualism involving the negation of all ideologies which should greatly serve to set the house in order; we have deliberated, and written at length about all these in earlier times. This latency period we believe can be greatly brought down if science becomes a much more global activity, and the ideas and ideals of the "Globalization of science" movement that we have been championing all along are accomplished. Thus, we would effectively be killing two birds with one stone.

I. INTRODUCTION

"A person with a new idea is a crank until the idea succeeds" – Mark Twain

"Progress means getting nearer to the place you want to be. And if you have taken a wrong turn, then to go forward does not get you any nearer. If you are on the wrong road, progress means doing an about-turn and walking back to the right road; and in that case, the man who turns back soonest is the most progressive man." - C.S. Lewis

- *Definitions of latency*

The term latency as it is understood in common parlance, has many different but closely related definitions. However, in most cases, the term latency is used as a synonym for undue and unwarranted delay, leading to slower progress, or no progress at all. In most contexts, therefore, it has a highly negative connotation and is equated to something that must be done away with, in the interests of societal, general or scientific progress. The term latency is also related to the term dormancy which refers to the state of having normal physical functions suspended or slowed down for a considerable period in time; in other words, a state of deep slumber or sleep. The usage of the aforesaid term dates back to the early seventeenth century, though at that time had a somewhat different connotation from the connotation it has today. By the end of the Nineteenth century, the definition of the term had moved much closer to its present meaning, and the term also began to be much more widely used. By the year 1954, the term also began to be used in computer science in a similar sense, though there are wide variations even in its use in a technical sense.

In computing and networking, the idea generally refers to the time gap between the point in time when an instruction is given for data transfer to the point when data transfer actually begins, (measured in convenient units such as seconds or milliseconds) or the time taken for a data packet to travel from one network node to another. Needless to say, high latency times are associated with low or poor quality service even in networking and general computing, and the latency time is generally seen as something that needs to be reduced; lowering latency is an important aspect of network management. Realtime communication is also seldom possible in the real-world due to technological constraints and imperfections. Therefore, standards and norms are often established in networking and computer science to define good and bad latency times. Techniques are also often prescribed in the aforesaid fields to reduce latency time,

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though the techniques we prescribe for science would naturally be different from those prescribed in networking. In various fields of technology, terms such as one-way latency, two-way latency, and round-trip latency are also sometimes used, though these are largely irrelevant for our purpose. The idea of latency has a somewhat different definition in physics, though this is somewhat irrelevant for our purpose; we restrict ourselves to the latency time in the acceptance of new ideas. [1] [2]

➢ *Delay in Acceptance of scientific ideas*

There has often been an inordinate delay in the acceptance of new ideas, particularly scientific ones; this has, as a matter of fact, been observed throughout scientific history, including both pre-modern and modern ones. Let us now go back way to the time of the Greeks.

➢ *Delayed recognitions in science*

Almost two thousand years before Copernicus, and a couple of centuries before the birth of Christ, the great but almost forgotten Greek scholar and polymath Aristarchus of Samos who was a student of Strato of Lampsacus, proposed a heliocentric model of the universe, with the earth orbiting the sun. Unfortunately, Aristarchus' ideas were rejected, and would be laid buried and forgotten for a very long time to come. Artistarchus' works are only known through references, and his original works are all unfortunately considered to be lost. It is only in the very recent past that this genius saw a resurgence of interest, possibly so in the last couple of decades. Another early counter-revolutionary was the ancient Greek philosopher Philolaus; he had proposed that earth was just another planet and orbited a central ball of fire. This concept is known as pryocentrism, and is different from the traditional doctrine of Heliocentrism; However, most such heterodox models would naturally have implied a lower level of importance for the earth and its beings.

Such ideas and notions were either rubbished, or brushed under the carpet. Ptolemy's ideas (he promoted a geocentric notion of the earth with other objects orbiting the earth in nested spheres) still reigned supreme, and would continue to reign supreme for a long time (indeed, several centuries) to come. Strangely enough, Ptolemy's ideas were considered to be correct by most leading scholars of the day. One problem with more radical models was that they may have appeared to have been counter-intuitive, and went against popular perception; there was also scant direct evidence for such models in the day; in the centuries to come Biblical dogma would compound the picture much more greatly. As such, geocentric models remained deeply ingrained in the popular psyche. The Christian clergy also later championed the idea that the earth was special, and humans represented the pinnacle of creation. The foundation for such ideas lay in the Bible.[3] [4] [5]

To state that the Church was highly dogmatic and ruthless to its perceived opponents could not have been an exaggeration. For example, the Italian philosopher and Catholic priest Giordano Bruno was tried, chastised, and was ultimately burnt at the stake in a highly gory and horrific manner for what the Church claimed to be his heretical ideas; his only fault was he challenged the orthodox ideas of the Church, and stated that the universe was infinite, and many solar systems potentially existed with the potential to harbour life; he had also refused to recant or take back his ideas. Unquestionably, Hindutva revisionism is also extremely dangerous in most forms, but is arguably no match for the dangerous doctrines then espoused by the church. [6]

The Copernican Revolution referred to an important and a paradigm shift in the field of astronomy from a geocentric model of the universe, and one that was totally centred around Earth, to a heliocentric approach, which in its classical form, was centred around the Sun; this paradigm shift was ultimately attributed to the Polish renaissance polymath and astronomer Nicolaus Copernicus who lived in the fifteenth and the sixteenth centuries. Thus, the sixteenth and seventeenth centuries bore witness to several momentous developments in science, all of which would lead to a resurgence of scientific activity, and notable among scientists of this period were the Danish astronomer Tycho Brahe's observations of planetary motions, Johannes Kepler's erudition of the three canonical principles of planetary motion, Galileo's use of the telescope to perform detailed astronomical observation (based on earlier work by Lippershey), (Galileo was later rather unfortunately subject to home imprisonment) and Isaac Newton's formulation of the laws of motion and gravitation. All these works greatly contributed to the renaissance; Copernicus' ideas (and indeed the ideas of most others) were not accepted immediately, and few astronomers were initially convinced by the Copernican system in spite of its relatively wide circulation. [7] [8]

[1] Souders, Steve. "Velocity and the Bottom Line", 2023

[2] Fowler, Martin (2010). Data Transfer Object. Patterns of Enterprise Application Architecture.

[3] Huxley, George (1964-05-30). "Aristarchus of Samos and Graeco-Babylonian Astronomy". Greek, Roman, and Byzantine Studies. **5** (2): 123–131. ISSN 2159-3159

[4] Carl A. Huffman, (1993) Philolaus of Croton: Pythagorean and Presocratic, p. 6. Cambridge University Press

[5] *Taub, Liba Chia (1993).* Ptolemy's Universe: The Natural Philosophical and Ethical Foundations of Ptolemy's Astronomy. *Chicago: Open Court Press.* ISBN 0-8126-9229-2.

[6] Michel, Paul Henri (1962). The Cosmology of Giordano Bruno. Translated by R.E.W. Maddison. Paris: Hermann; London: Methuen; Ithaca, New York: Cornell. ISBN 0-8014-0509-2

[7] Armitage, Angus (1951). The World of Copernicus. New York: Mentor Books

Darwin, whose full name was Charles Robert Darwin, needs no introduction to most people. He was an English naturalist, geologist and biologist, related to Erasmus Darwin and widely revered for his contributions to evolutionary biology. His epoch-making publications challenged the orthodox of the church, and replaced earlier flawed or limited theories of evolution proposed by Jean Baptiste Lamark and others. His theory that all species of life have descended from a common ancestor is now accepted as a fundamental canon in science. His ideas were revealed through various works of which "On the origin of species" published in 1859, and "The descent of man" published in 1871 stand out as the most notable and revolutionary ones. [9]

The initial reception to Darwin's ideas was quite mixed, but his works have continued to induce and inspire awe scientific and scientific and religious debates, besides wide public curiosity and interest. It was certainly not subjected to heavy and widespread ridicule or outright condemnation, and was debated less heavily than earlier works on the subject by the writer Robert Chambers and others. Initial religious reactions were also indeed mixed, and the Church of England criticized and lampooned the book. However different sections of the liberal establishment supported Darwin's ideas either hesitantly or wholeheartedly, and stalwarts such as the English biologist and anthropologist Thomas Huxley became its most ardent supporters and champions. There were also public debates on Darwin's work in the year 1860 and the rest of the decade, with different parties adopting ideological stances on expected lines. Thus, it would be obvious to most readers that the church had considerably mellowed down by this time, and science and objective scholarship was achieving a silent victory, and eclipsing religious dogma and orthodoxy. However, there is still a latency in the acceptance of (even correct and empirically provable) ideas and constructs among some groups such as Hindutva groups, Islamic scholars, left-leaning intellectuals and others. We have been commenting on this off and on over the past several years.[10] [11]

In retrospect, the Austrian friar and biologist Gregor Mendel is referred to as the father of modern genetics with his greatly admired work on pea plants, yet he was unknown and unsung in his own lifetime; he died in relative obscurity. Luck would play a part here; he was shy and reticent, and the fact that he wrote in German does not appear to have helped him and his cause either. Several decades later, the Indian scientist Yellapragada Subbarow's ideas were to be initially shunned for similar reasons. However, Mendel's ideas saw an upsurge of interest sometime after 1900, with Hugo de Vries, Carl Correns and others supporting him and his work. Albert Einstein was relatively luckier, and his annus mirabilis occurred in 1905, when he published several landmark and seminal papers. He was recognized almost immediately thereafter and was hailed as a genius of his age well within his own lifetime. John Forbes Nash was relatively unlucky; his pioneering was published in 1949, but barely got noticed immediately; much of his own life was obscured by schizophrenia, from which he only slowly recovered.

It is said that the early twentieth century's eminent rocket scientist Robert H. Goddard's ideas too were initially mocked and ridiculed in many circles. The famous Indian astrophysicist Subramanya Chandrashekar also had a spat with Sir Arthur Eddington in the 1930's, and only became recognized several decades later, winning the Nobel prize eventually. Niels Bohr, the outstanding Danish physicist, was relatively lucky, and won the Nobel prize at the age of thirty-seven for his contributions to physics made just a few years earlier. Nikola Tesla was an outstanding scientist and intellectual who had vowed to change the world with his inventions. He was, however, not so lucky, and was sadly eclipsed by Edison's popularity which he could never hope to match. It is not easy to identify and isolate the early or delayed acceptance of scientific work; nonetheless, this must eventually be done in the interests of science and society, and we must initiate baby steps in this regard. Some of Julius Robert Oppenheimer's contributions to science were also not recognized immediately. Humphrey Davy, James Clark Maxwell, and Michael Faraday were recognized in their own respective lifetimes, though not immediately. The list goes on and on. [12] [13]

- *Sleeping beauty studies in science*

A Sleeping Beauty paper (also known in short as an SB paper) in science refers to an often-eminent paper, or a paper with significant scientific or scholarly value (usually very highly innovative or original), whose importance is not recognized for a significant duration of time, often spanning several years (or often a couple of decades) after its initial publication. In the initial years, its readership, widespread publicity and its citation metrics may be limited; this may be akin to a long hibernation period which may then be followed by a sudden surge or spike in popularity. These may also be referred to as the sleep period and the awakening period respectively. The paper may then achieve everlasting fame or change the scientific contours of the field or discipline in

[8] Bartlett, Kenneth, ed. The Civilization of the Italian Renaissance: A Sourcebook (2nd ed., 2011)

[9] Gould, Stephen Jay *(1993). "Foreword". In Jean Chandler Smith (ed.).* Georges Cuvier: an annotated bibliography of his published works. *Washington, DC: Smithsonian Institution Press.* ISBN 978-1-56098-199-2.

[10] Ashforth, Albert. *Thomas Henry Huxley*. Twayne, New York 1969.

[11] *Bowler, Peter J. (2003). Evolution: The History of an Idea (3rd ed.). University of California Press. ISBN 978-0-520-23693-6.*

[12] Ames, Joseph Sweetman (Ed.) (c. 1900). The Discovery of Induced Electric Currents. Vol. 2. New York: American Book Company (1890)

[13] Maxwell, James Clerk (1890), The scientific papers of James Clerk Maxwell Vol I and Vol II

question. The idea of sleeping beauty papers was first popularized in a paper published by AFJ van Raan in 2004, but has since had many adherents. Even though there have been several instances of sleeping beauty papers, (among the earliest papers that is now referenced to this category, is an 1884 paper published by the American statistician and mathematician Charles Sanders Peirce which lay dormant for well over a century; Also interestingly, it can be noted that a paper which was published in 1935 by Albert Einstein, Boris Podolsky and Nathan Rosen, did not receive widespread attention until around the year 1994 or so). Many other researchers have never got their due. The British chemist Rosalind Franklin also contributed greatly to the discovery of DNA structure, but never got the recognition she deserved. Likewise, the theory of continental drift proposed by Alfred Wegener got recognized late. Other examples include the recognition for scientists like American Physicist Karl Guthe Jansky, Eunice Foote, Ida Noddack, Nettie Stevens, Lise Meitner, Charles Best, James Collip, and Nicolae Paulescu, among others. Researchers and scientists are divided over the prevalence and preponderance of delayed recognition. This may be in part due to the absence of reliable and comprehensive publication and citation statistics for papers published in different academic disciplines, geographies and journals. A source also suggests calling such inordinate delays "Mendel's syndrome", though the usage of the term does not appear to have gained widespread popularity. This term is tied to the notion that being far ahead of one's own time (or being anti-establishment in general) may initially prove to be counter-productive or self-defeating. This is also based on the presumption that most third-party researchers citing articles merely follow the crowd and fail to carry out a deep introspective analysis of their own volition or accord.

There are wide variations based on these parameters, though the causes thereof are scarcely known. Sleeping beauty papers are assessed for factors such as the depth of sleep, length of sleep, and awake intensity. Such analyses have also been performed for papers published in various disciplines and geographies. A sleeping beauty paper is usually awakened by a new champion (known as a prince) who then steers the paper to widespread popularity. Later studies, including work carried out in the years 2015 and 2020 (including papers published in the National academy of sciences, and work carried out by Moodley, Hernandez Serrano, Dijck and Dumontier) have also overwhelmingly reinforced the notion that sleeping beauty papers are common in science, and not a rarity as some would like to imagine or assume, with delays of over fifty or a hundred years often being witnessed or observed. They are, in effect, the norm rather than the exception. Little, however, appears to have been done by means of a root cause analysis or a causal analysis, but research in this field must now and henceforth pick up in the interests of the advancement of science. Consequently, remedial action is never identified and taken up. The Authors' popularity, sphere or zone of influence along with the status of the co-authors may also matter to a great or a significant degree. But so also probably do, factors such as ethnicity, nationality and gender. Papers published in less influential journals may get the short shrift, even though such papers may by no means be inferior. [14] [15]

Other widely practised related areas of study are bibliometrics and scientometrics. Bibliometrics is defined as the quantitative method of citation and content analysis for scholarly journals, books and researchers in different geographies and fields, and is typically assessed or computed by measuring the number of times a certain work is cited by other resources, and the quality, depth and other parameters of such citations, including the name of the researcher citing the work. Scientometrics on the other hand, is a field of study which measures and analyses scholarly literature; it is essentially a sub-field of informetrics. Major research issues studied in this subfield include the measurement of the scholarly and scientific impact of research papers and academic journals, a meaningful analysis and assessment of scientific citations, and the use of such measurements in management and policy studies. All these metrics will have a bearing on this work, and though mentioned only in passing, must be studied in conjunction and tandem with this work.[16] [17]

➢ *Types of acceptance*

There are several types of acceptance in research, and we lay bare a few of them below; of course, the duration taken for acceptance of a paper or a piece of research is of little relevance here; this list focusses on the nature and character of third parties accepting or rejecting a piece of research in due course.

- Acceptance (or rejection) by academicians and other scholars (justified and based on a holistic and unbiased appraisal). This may include acceptance by specialists or non-specialists, and acceptance by researchers in related fields.
- Acceptance (or rejection) by academicians and other scholars (non-justified, and not based on a holistic and unbiased appraisal). This may also include acceptance by specialists or non-specialists, and acceptance by researchers in related fields.
- Acceptance (or rejection) by academicians and other scholars: Outliers (In this case, only a few other researchers, scientists and scholars accept or reject a piece of work (based on either an unbiased or a biased

[14] Van Calster, Ben (2012). "It takes time: A remarkable example of delayed recognition". *Journal of the American Society for Information Science and Technology*

[15] A study of the "heartbeat spectra" for "sleeping beauties" Author links open overlay panel Jiang Li [a], Dongbo Shi [b], Star X. Zhao [a], Fred Y. Ye

[16] Spaulding, Nancy E.; Namowitz, Samuel N. (2005). Earth Science. Boston: McDougal Littell. ISBN 0-618-11550-1.

[17] Harnad, S (2008). "Validating Research Performance Metrics Against Peer Rankings". Ethics in Science and Environmental Politics. **8** (11): 103–107

evaluation). In this case, a small group of researchers may accept the research in question first, paving the way naturally for others to follow.

- Early acceptance: The work is accepted early, by most or all researchers; and the researcher gets recognition fast.
- Universal acceptance: The work is accepted late, by most or all researchers, and the researcher only gets recognition very slowly.
- Laggards: Laggards may not appreciate or subscribe to a new idea early, and there may be several factors behind this, as discussed in our paper.
- Acceptance (or non-acceptance) by laity: This refers to the acceptance or non-acceptance by the common man in some or most cultures. Such acceptance on non-acceptance is seldom based on a holistic evaluation. Ideologies, dogmas or the prevalent zeitgeist may play a major or a dominant role here.
- Acceptance by laity in different cultures: This is often a time-consuming process, and may span several decades or centuries in some cases.

➢ *Outside in versus inside out approach*

We believe, and we have already stated in an earlier paper published by us not too long ago, that there are possibly two common ways a new idea can ultimately gain traction. One may be referred to as the "inside out phenomenon", and the other may be referred to as the "outside in phenomenon". In the case of the former, changes are first accepted (usually wholeheartedly or with some reservation) by the mainstream scientific community, and then spread outwards to the lay people (i.e. the laity) or the common public. (This is probably the most common and routine way new ideas are ratified and accepted given the fact that specialists are often in a much better position to appreciate new ideas than the average layman, or because laymen may blindly or implicitly believe in what specialists say, either correctly or fallaciously) In case of the outside in approach, the common man (comprising a set of non-specialists), is aware of, or appreciates a new idea more quickly than mainstream researchers, while there is a continued or an ongoing resistance from the mainstream scientific community; this phenomenon most commonly occurs when the scientific community (at large) is highly degraded or not uptodate in a particular respect, or has become rigid or dogmatic (or averse to change or new ideas). A more common or interesting example of this is the case of nineteenth century Indological scholars, (or even Marxist historians) who proved to be highly impervious and impermeable to change and adaptation, and even blind to the harsh realities of the twenty-first century, as they did not embrace changes for decades; thus, their discipline and their practice has already effectively collapsed. The general observation as observed throughout time is that practical inventions get accepted relatively more quickly rapidly (given their practical use) while abstract ideas get accepted much more slowly; acceptance in various fields of the social sciences are typically much slower; this is only an observation, and there could be many exceptions to this rule. Can we use the Sociological ninety ten rule here for a handy and an effective analysis? [18]

➢ *Theory of 'Academic Lag': Academics output lags behind technology*

Commercial enterprises may not depend greatly on academic research. There is enough evidence to attest to this. For example, companies like Google and Microsoft (which are stalwarts in their respective fields) have contributed greatly to technological progress, as have companies in the field of Artificial Intelligence or AI, among other fields. But to what extent have they depended on pre-conducted or pre-available research? The results may indeed be surprising. There is a large vacuum in research, and often academic research only mirrors best practices, concepts and paradigms already practiced by industry. Most research is conceptualized and led by R&D houses and R&D centres, and scantly by university departments. This trend, we believe, may only get accentuated with the passage of time. Of course, there may be exceptions. But what is the observed norm, and what are the exceptions? We look forward to empirical studies here on the lines of those carried out for sleeping beauty studies, and also recall the theory of constraints proposed by the Israeli genius Eliyahu S. Goldratt. What is the lead area and what is the lag area here? Of course, research by Indian companies is virtually non-existent, or severely and seriously lacking. Indian universities fare much worse. In the case of the latter, both theoretical research and practice still appear to be lacking, at least in the present. Can we also put the 'Sociological Ninety-ten rules' to good practical use here? There may also be an observed variation in latency by geography; science in developing countries may evolve relatively more slowly due to a lack of popular scientific awareness; needless to say, this may be addressed, and such observation nipped in the bud. [19]

➢ *Theory of 'Inter-disciplinary Academic Lag': some disciplines change faster than others. Some are subjected to forced change.*

We also offer the theory of 'Inter-disciplinary Academic Lag' for consideration, evaluation, ratification and acceptance by other scholars and researchers. Of course, this must be based on sound, careful, and methodological observation. Our basic hypothesis is that some disciplines (or branches and fields of science) change and evolve faster than others. Thus, from our perspective, progress in various fields in the social sciences lags behind progress in other fields, and there can be wide variations among various fields of the social sciences too; thus, progress in fields such as sociology, philosophy and psychology can be even slower than other fields in the social sciences. There are several reasons for this, and among them

[18] The Isolation of Scientific Discovery: Indifference and Resistance to a New Idea SIMON S. DUNCAN Research Policy Programme Lund University, Science studies, 1974

[19] Dina Bass, Jack Clark (25 January 2016). "How Microsoft plans to beat Google and Facebook to the Next Tech Breakthrough". *Bloomberg*.

could be the fact that there is no industry collaboration in such fields of study, the fact that ideology driven approaches often reign supreme in such fields of study, there is little representation from developing countries and therefore paradigms, monetary rewards in such fields are slower, theories and hypotheses in such fields of study are invariably and inevitably Eurocentric in orientation, the fact that social sciences mostly study and analyze culture, and are therefore culture-driven and culture-based, the presence or a smaller (and more orthodox) student base, the wider and greater prevalence of vested interests, (professional, institutional, cultural, religious, and nationalistic, and also careerism) and the absence of competition between scholars and universities. Not only is the number of scholars lower, the scholars and researchers in such fields of study tend to be older too; this can be observed more often than not in such fields of study. There is also potential racism in this field, and often attendant extreme peer-review bias. There is also less experimentation and lab-driven research involved in such fields of study, (even though fieldwork is indeed carried out in some cases) and less real-world application too.

Thus, we may also be able to extend William F Ogburn's (He was an early twentieth century American sociologist) theory of cultural lag here, and put it to more heterodox uses. This would indeed be an exercise worth undertaking, at least from our perspective; We must also note that these are only observations, and there could be exceptions to every rule. All this also means that the 'Globalization of science' as we see it, is paramount for the healthy and uninhibited development of various fields in the social sciences. We must also at the same time, position the 'latency period' for the acceptance of scientific ideas as an indicator of scientific maturity, across or within scientific disciplines, cultures or societies. We must identify the reasons for good performance and bad performance as well, and cascade it to other contexts and situations. Reducing this latency period will of course always lead to faster scientific progress.

- *What is the panacea to such ills?*

We can do a lot to stymie non-progress and accelerate meaningful progress in science in specific contexts, and as a whole. This would hinge on the following, among others, (a) A case by case study of delayed recognition of scientific work, inadequate recognition, or no recognition at all (b) A case by case study of low scientific out put in distinct fields of science (c) A case by case study of low scientific output in distinct geographies. Thus, a root cause analysis and a causal analysis may be in order here, and must be complemented by detailed discussions and debate both among professional scholas, and non-professional scholars. This can be complemented by techniques such as brainstorming, focus group discussions, creative thinking techniques, lateral thinking techniques, TRIZ, etc. We have discussed and put forth techniques for root cause analysis or RCA and causal analysis (or cause and effect analysis, including fishbone diagrams and Ishikawa diagrams), and useful and comprehensive materials are readily available on the worldwide web. An inductive approach (combined with nomothetic approaches and the building of distinct rulesets) will also unquestionably work, and we must find out and ascertain lacunae and possible areas of improvement in all spheres and domains of scientific endeavour. Working and permanent databases can also be built wherever necessary. Another useful and meaningful approach would be to analyze paradigm shifts in science as and when they happen to observe discernable patterns. The laity or the common man representing the sphere of acceptance or rejection of scientific paradigms, can be broken down into different elements such as level of education, religion, linguistic affiliation, and clear patterns identified and assessed. This would be another meaningful and useful exercise to undertake. Thought leaders (and champions) must also be identified and nurtured on a periodic basis, so that they can become useful agents of change. This is because the uneducated laity only follow leaders, often leaders with strong personalities, and impressive credentials. [20] [21] [22]

We must also identify and isolate scientific ideologies which may include or overlap with political, social, epistemological, and ethical ideologies, to name just a few. This concept has been in wide circulation from at least the 1960's, and has been debated and defined by George Canguilhem and others. Even though a modification and a reassessment of this concept must be carried out from time to time, few will deny that scientific ideology is the basis and philosophical and epistemological foundation of much of scientific endeavour. Ideologies may also be derived from the researchers' social, cultural, religious, or ethnic background, and would represent the sum total or the intersection of a person's values, ideals, beliefs, assumptions, and expectations. These factors would naturally get amplified in social sciences research, given its composition, orientation and quintessential nature. We must also proceed to categorize and break down scientific ideologies into many types and subtypes if necessary, (Examples, being Hindutva, Dalit nationalism, Marxism and Dravidian nationalism from an Indian perspective, and Eurocentrism, Afrocentrism and Sino centrism elsewhere, to the extent it impinges on science, or

[20] Sujay Rao Mandavilli (2023) Making the use of Inductive approaches, Nomothetic theory building and the application of Grounded theory widespread in the social sciences: A guide to better research and theorization in the social sciences IJISRT 2023: May. 1 May.

[21] Sujay Rao Mandavilli (2022) Social Responsibility over Academic freedom: Emphasizing Ethics and Codes of Conduct geared for a Scholar's duties towards science, society and the education system in Twenty-First Century Science IJISRT 2022: September.

[22] Sujay Rao Mandavilli (2023) Unveiling the Sociological Ninety-ten rules for Social Sciences research: Towards better hypothesis formulation in the Social Sciences in the interests of higher quality research and intellectual multi-polarity IJISRT 2023: February.

even outright racism in science) and fringe doctrines like scientism (or an over-reliance or an exaggerated reliance of science which we have discussed and debated before) also fall under the purview and radar of science. Scientific ideologies may also lead to what we would like to call "Intellectual worlds" or "Quasi-intellectual worlds". Adherents (who may be conscious or semi-conscious) to such intellectual worlds or quasi-intellectual worlds may wrap themselves in a make-believe world dictated by ideology ad dogma.

Scientific ideologies will also, needless to say, impact research, and we can also have the idea of a research ideology usefully defined. They will also determine the time it takes for research to be accepted (or scientific output to be evaluated), and also impact the direction and speed of scientific progress. This would lead to enhanced scientific output, diverse cultural perspectives, elimination of vested Interests, faster acceptance of theories, faster social and cultural change, emic perspectives, better theorization, non-misuse of academic positions, cross-cultural research design, and better quality science, for example. Scientific ideology may also (and rather unfortunately so) even set the tempo and direction of research. For example, we may have researchers either implicitly or explicitly supporting socialism or laissez-faire capitalism, and may base their recommendations over their own personal preferences.

We must also identify (and track down to source) what we may call false positives (acceptance, including wide acceptance of erroneous scientific ideas and theories), false negatives (rejection of correct theories, etc.), and ensure that theories and paradigms in science are correctly evaluated and tested. The case study method must undoubtedly be used, and will come into useful play here. This must be carried out with a vengeance, and Intellectual bulldozers are necessary. There must also be indicators of false positives and false negatives; For example, new paradigms may be correct when the educated accept it earlier, people who do not follow ideologies accept it earlier, people who follow ideologies may not accept it immediately, etc. Also note that less educated people may follow ideologies, older generations may resist change, and that younger generations may accept change more easily. New paradigms may be wrong if the educated refute it, people who subscribe to the relevant supporting ideologies may accept it faster than the others, people who subscribe to counter-ideologies refute it doubly.

If this is not done, social sciences may lapse into irrelevance as evidenced by the recent decline in enrollment to Indological courses abroad. We must sound the bugle and the wakeup call now. A critical analysis also be carried out throughout the theory, hypothesis and idea lifecycle which includes gestation of theories, hypotheses or ideas, incubation of theories, hypotheses or ideas, dissemination of theories, hypotheses or ideas, and the eventual acceptance of theories, hypotheses or ideas for any meaningful outcome to be attained or accomplished. This must also of course be correlated with the scientific output in various societies, geographies, and academic disciplines, and the presence or absence of meaningful cross-cultural academic or scientific collaboration, including vertical and horizontal collaboration. This must also, of course, be combined with interdisciplinary approaches and collaboration. This approach can also be combined with time crashing techniques which can be meaningfully and gainfully employed to reduce the latency time for the acceptance of new ideas. As always, a meaningful and comprehensive root cause analysis of inordinate delays in acceptance, evaluation, or rejection of scientific frameworks and paradigms must be the pillar upon which remediation frameworks must be constructed. There are many ways to achieve faster and greater progress in science. The first would be to improve the education system on the principles we had specified and laid bare in our two papers on "Anthropological Pedagogy" and the "Sociology of science" several years ago. The second would be to build a robust twenty-first century intellectualism involving the negation of all ideologies which should naturally and greatly serve to set the house in perfect and working order; we have deliberated, and written at length about all these in earlier times. We must always say a big no to all forms of ideologies in science.[23] [24] [25]

II. CONCLUSION

We have published several papers on scientific method over the past couple of years, and this paper is crucially and critically tied to those earlier papers, and must be read and understood against the backdrop of our entire work. In this paper, we strongly emphasize, and reiterate that reducing the latency time for the acceptance of new ideas, and an analysis of the root causes of delayed acceptance must be fundamentally and critically carried out in letter and spirit be scholars and researchers dedicated to this cause. Techniques must also naturally be developed for this, and root cause analyses carried out. This will be a crucial and critical factor for enhancing the rate of scientific progress and will lead to what we had called "Scientific progress at the speed of light". For all this, the adoption of ideology-free approaches, making knowledge universally or near universally accessible, an

[23] Sujay Rao Mandavilli (2023) Redefining Intellectualism for a post-globalized world: Why present-day intellectualism is obsolete and why a comprehensive reassessment of intellectualism is required *IJISRT* 2023: August.

[24] Sujay Rao Mandavilli (2021) Unleashing the potential of the 'Sociology of Science': Capitalizing on the power of science to usher in social, cultural and intellectual revolutions across the world, and lay the foundations of twenty-first century pedagogy.

[25] Sujay Rao Mandavilli Introducing Anthropological Pedagogy as a Core Component of Twenty-first Century Anthropology: The Role of Anthropological Pedagogy in the fulfilment of Anthropological and Sociological objectives *ELK Asia Pacific Journal of Social Sciences* 2015: .

exposure to other cultures and societies, cross-cultural collaboration including both vertical and horizontal collaboration as the situation warrants, besides inter-disciplinary approaches are a must. All this will naturally have a ripple effect on society and will lead to scientific, societal, and cultural progress at a much higher rate than at present with attendant benefits for all denizens of the world.