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Advancing the Use of "Continuous Zero-Based Reassessment of Assumptions, Hypotheses and Methods": A Vital Tool and Technique in the Interests of Better Science

Sujay Rao Mandavilli

Abstract:- The approach conceptualized, described and advocated in this paper may appear to be highly conventional and non-radical at the outset and at a preliminary or a cursory glance, but it has plenty of substance to offer to the healthy pursuit of rigour, dispassionate objectivity, and wholesome and balanced scientific activity. We do not aim or propose to set the cat among the pigeons or create an unwarranted flutter that could potentially rattle and alienate scholars, but instead create in the medium and the long-term, a healthy, an infallible and a dedicated enterprise devoted to the constant grounds-up assessment and reassessment of assumptions both explicit and implicit, methods, methodologies, tools, techniques, hypotheses, processes, procedures, frameworks and paradigms, including all legacy and archaic methods, methodologies, tools, techniques, hypotheses, processes, procedures, frameworks and paradigms such that an intrinsic self-correcting mechanism can be forged and materialized to channelize science and scientific activity in a meaningful and a productive long-term direction, and in the healthy interests of science and society as a whole. Needless to say, we expect this to lead to faster scientific progress as well, and what we have always called "scientific progress at the speed of light".

I. INTRODUCTION

"All progress is born of inquiry. Doubt is often better than overconfidence, for it leads to inquiry, and inquiry leads to invention" Hudson Maxim

"The illiterate of the twenty-first century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn" Alvin Toffler

The approach conceptualized, described and advocated in this paper may appear to be highly conventional, conformist, orthodox, unadventurous and non-radical at the outset and at a cursory, preliminary and a superficial glance, but it has plenty of substance, material and meat to offer in the direction of and the path towards the healthy pursuit of extreme rigour, dispassionate and imperturbable objectivity, and wholesome and healthy scientific activity as well. We do not aim or propose to set the cat among the pigeons or create an unwarranted flutter that would bewilder or rattle well-meaning scholars and intellectuals and throw them of course, but instead create in the medium and the long-term, a healthy, an infallible and a dedicated enterprise devoted to the constant grounds-up assessment and reassessment of assumptions both explicit and implicit, (any premise that is accepted as true or certain, but without certainty or adequate or sufficient proof or evidence) premises, presuppositions, methods, methodologies, tools, techniques, hypotheses, processes, procedures, frameworks and paradigms, including all legacy and archaic methods, methodologies, tools, techniques, hypotheses, processes, procedures, frameworks and paradigms such that an intrinsic self-correcting mechanism can be forged to channelize science and scientific activity in a meaningful and a productive long-term direction, and in the healthy interests of science and society as a whole.

We had discussed many of the terms, if not most of them in an earlier paper, but we believe they would need no introduction to most scholars, thinkers and intellectuals alive today. Needless to say, we expect this to lead to faster scientific progress as well, and help ditch and dump less-than-ideal constructs and ideas by the wayside. It will also, we hope and estimate, lead to bullet proof reliability in various avenues and fields of scientific activity, as far as existing evidence or established methodologies will permit or allow for it. This approach would be somewhat akin to the zero-trust security model in information security, and draw some inspiration from it. The latter is based on the "trust no one, verify everything" principle. Therefore, as per this approach, all assumptions, hypotheses and methods must be constantly reassessed from time to time, especially when new evidence is introduced or presents itself, or when there is new or added evidence and reason to believe that an overhaul or a thorough revamp of existing structure is in order. But just what is an assumption? [1] [2]

An assumption may be loosely defined as a supposition, a proposition, an axiom or a postulation, often or commonly a mistaken or a not completely correct or a factual one, and one that is held without complete evidence or rigorous and thorough testing. It is usually a non-self-

[1] Research Methodology: Methods and techniques: Second revised edition, CR Kothari, New Age publishers
[2] Research Methodology: A step by step guide for beginners, Third edition, Ranjit Kumar, Third edition, 2011

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evident truth, and is also related to implicit and deeply cherished beliefs. In some other cases, though rather less commonly, it may refer to the unfounded belief, and one held without substantive evidence, that an event will occur in future. Researchers may also hold without complete proof that a research model is true, or that a certain relationship between two or more variables exists. It is generally required and essential that assumptions must be made on the basis of previously conducted research, though this methodology may not always be followed in practice. Conclusions may often be rapidly and hastily drawn without making clear assumptions; this often causes a cascaded, magnified and an amplified bias, and a greatly enlarged margin of error. However, it is necessary in many cases to make assumptions as all aspects of a study cannot often be known or pre-determined beforehand. However, the four pillars of research are ontology, epistemology, methodology, and axiology, and these will always hold good. Ontology is a branch of science which deals with the study of entities and their existence; Epistemology is the science of knowledge; Axiology is the study of values and value systems.

There are also many types of assumptions, and these include fundamental assumptions (Assumptions fundamental to the research or the nature of study being carried out); peripheral assumptions (assumptions that are not fundamental, critical or crucial to the research or the nature of study being carried out); assumptions that premises and results of other research studies referenced in this particular research study are correct; assumptions regarding utility (Assumptions about what benefits end users of research derive from our research); assumption regarding viability or feasibility (Assumptions regarding viability and feasibility or research made beforehand, and without full and adequate testing); Ethical assumptions or assumptions moored in ethical principles; this would also refer to the innate belief that the researcher is knowingly doing no wrong. Robert H. Ennis (Ennis 1982) classifies assumptions into two broad categories, namely used assumptions and needed assumptions. Used assumptions are those assumptions that are used or referred to in a study, while needed assumption are all the assumptions necessary for the purposes of the study in hand. Assumptions are also sometimes classified into implicit and explicit assumptions. Implicit assumptions are those which cannot be clearly stated in explicit terms while explicit assumptions refer to those assumptions which can be clearly articulated and orchestrated.

Much more importantly, crucially and significantly, we also believe assumptions can also be primarily categorized into consciously adopted assumptions and subconsciously or unconsciously adopted assumptions; we believe this would be an extremely important demarcation and a distinction to make, and in line with the overall objectives of our much-hyped and constantly harped upon "globalization of science movement". The latter with be in consonance with, and reflective of cultural biases and prejudices that may be manifested, expressed, or unmanifested and unexpressed; this means that most researchers may not even be aware of the biases and prejudices they implicitly and subconsciously hold. hold. this idea is also closely, and in fundamental ways tied to our systemic approach of cross-cultural research design which involves the recruitment of scholars from diverse cultural background in any meaningful and a productive research design. The idea of subconscious assumptions is also related to the idea of a paradigmatic assumption. Paradigmatic assumptions refer to deeply held assumptions that define the very way an individual looks at the entire world. Overcoming paradigmatic assumptions can be an unnerving experience indeed and can cause great misery and anxiety to an individual. Indeed, we believe that the whole edifice of science (particularly assumptions made in theories, frameworks and paradigms in various fields of the social sciences) can be shaken up from its roots and can be recast in original, novel, fruitful, productive and benefecial ways. This would cause an upheaval of sorts that many people won't like, but so be it. If it needs to happen in the overall interests of science, it must happen. This may also require a generational change or as what Thomas Kuhn and others have called, a paradigm shift. It may also require castigating what is sometimes referred to as "zeitgeist", or the spirit of the age which affects and impacts scholars and thinkers both subconsciously and unconsciously. [3] [4]

Deep-rooted assumptions must especially be questioned more rigorously and severely; The questioning of assumptions must depend on how central they are to a topic or a discussion or an area of study. The number of other papers or works of scientific study that depend on the assumption in question must also be taken into consideration while determining the rigour and the vigour with which it is questioned. The overall benefits to science stemming from or arising from an exercise must of course, always be borne in mind all the time. Thus, changes in deep-rooted assumptions can change science more; this could all the more make it an exercise worth undertaking. We must also now momentarily delve into the principle of what is commonly today referred to as Occam's razor. Occam's razor is a principle usually attributed to the fourteenth century English philosopher William of Ockham which says that if there are two different ideas to explain the same concept or a phenomenon, one should always prefer the simpler and the more straightforward one. The principle also states that no more assumptions should be made than the bare and the absolute minimum needed. This principle is also sometimes referred to as the principle of parsimony. It forms the core foundation of all theory building and scientific modelling. All this is hardly even done in real-world science, at least in many important fields of study, hence the need for more proactive approaches in future. Logical non-sequiturs and leaps of logic must also be isolated, and thoroughly identified and questioned. A logical non-sequitur arises when a premise or a conclusion does not logically and rationally follow from other. A non-sequitur

[3] Gleick, James *(1988). "Chapter 2:Revolution". Chaos: making a new science. New York: Viking Penguin.* ISBN 0-670-81178-5.

[4] Kuhn, Thomas *(1970).* The Structure of Scientific Revolutions *(2nd, enlarged ed.). University of Chicago Press.* ISBN 978-0-226-45804-5.

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makes any conclusion reached totally and utterly invalid. Thus, the following conclusions follow, and can be reached from our discussion above. [5] [6]

- Changes to (which follow a questioning of) deep-rooted assumptions can change science more fundamentally and intrinsically.
- Changes to (which follow a questioning of) assumptions can change science more fundamentally and intrinsically particularly where other research is dependent on it, or determined by it.
- This must be a proactive approach, and must be carried out by a bona fide group of researchers and scholars trained in scientific method.
- Researchers must also naturally focus on those issues (and unhealthy trends) that are bound to inflict social harm, or mitigate social good.
- Continuous zero-based reassessment of assumptions, hypotheses and methods must be done by dint and force or habit, and must ideally follow every research conducted, or every scholarly activity published.
- Cross-cultural approaches can be followed for better effectiveness.
- Inter-disciplinary approaches can be followed for better effectiveness.
- All assumptions need to be justified and can be thrown into wide question or suspicion if they are not.
- The principle of Occam's razor needs to be applied always.
- Researchers must eventually work towards minimization or elimination of assumptions, though this may be easier said than done.

Examples where "Continuous zero-based reassessment of assumptions, hypotheses and methods" can lead to paradigm shifts in science

The following are some common examples where "Continuous zero-based reassessment of assumptions, hypotheses and methods" can lead to paradigm shifts and an upward tick in activity in various fields of the sciences.

II. CLASSIFICATION OF HUMANS INTO "RACES" AND THEORIES ON THE ORIGINS OF HUMANS

The concept of race which dates its origin back to scholarly works instituted and established in the sixteenth century, has been significantly and greatly used and perversely misused both in the eighteenth and the nineteenth centuries, though it has often been mired and mucked in a great deal of disagreement, controversy and confusion, as countries like the USA and South Africa have their own definition of "race"; the last two are mostly determined by political exigencies. In India, the term "race" is pretty much meaningless as a great deal of miscegenation is believed to have taken place since ancient times. The term "race" is sometime thought to have been derived from the French phrase "especes-ou-races d'homme" (English: species or races of humans) and the German word "Rasse," meaning "breed". It is said that Immanuel Kant used the term in 1775 "races of mankind" in 1775 to designate a group of peoples, who could be distinguished from others, in accordance with their physical attributes. Anthropologists have attempted to divide mankind into distinct groups; for example, in his 1775 treatise "The Natural Varieties of Mankind", the German Anthropologist Johann Friedrich Blumenbach proposed five major divisions or "races" which were the Caucasoid race, the Negroid race, the Mongoloid race, the American Indian race, and the Malayan race. (He is regarded as the father of modern anthropology, and classified humans into these five "races" based on their physiology and appearance)

In 1828, the French naturalist and zoologist George Cuvier proposed a threefold classification namely, Caucasoid, Negroid, and Mongoloid based on skin colour, and other physical attributes. Other classifications were proposed by researchers and Anthropologists of the likes of Francois Bernier, Bradley, Charles Pickering, Joseph Deniker, Earnest Hooton, Garn, Coon, Boyd, Birdsel and Huxley. Most of these definitions are obsolete by today's standards as the idea of "race" is not only nebulous, but also misleading. It is most certainly not static either. Most modern researchers talk about clines, haplogroups, ethnobiological identities, and continuously varying gradations in morphological and metrical traits among others. Some other contemporary researchers like Theodosius Dobzhansky and Ashley Montagu have defined race as genetically distinct Mendelian populations, which differ genetically among themselves. (Dobzhansky 1970) (Montagu 1972)

Anthropologists had earlier used many other different terms or terminologies such as "varieties" or "ethnic stocks" to classify mankind based on their self-evident physical attributes and characteristics. There were two groups of race study scholars, namely monogenists and polygenists. Monogenists believed that all human races arose from a single stock, while polygenists felt that human races arose independently in different parts of the world. In the seventeenth century, the naturalist Francois Bernier, a naturalist, grouped humans into four basic groups using facial and body forms. In his famed, seminal and noteworthy work, "Systematic Naturae", the eminent taxonomist Carol Von Linnaeus, classified humans into four basic groups, namely, white, yellow, black and red based on their skin colour and morphology. Other categorizations were made by Buffon in 1749, and by Molnar and several others. (Bernier 1684) (Linnaeus 1735) All these classifications may be outdated, but the merits and demerits of each approach can be probed and ascertained even today.

The OAT assumes the pre-existence of archaic populations outside Africa which is indeed weird and bizarre. Assertions and statements such as "The Out of

[5] Shabo, Magedah *Rhetoric, Logic, and Argumentation: A Guide for Student Writers*. United States, Prestwick House, 2010

[6] Wilson, E.O. (1999). "The natural sciences". *Consilience: The Unity of Knowledge* (Reprint ed.). New York: Vintage. ISBN 978-0-679-76867-8.

Africa theory" (or the recent out of Africa dispersal of humans hypothesis) is well-established must be taken with a very generous pinch of salt. Thus, many scientists today think that Homo Sapiens interbred with Neanderthal Man. Indeed, the basis of the classification of archaic humans into Homo Sapiens, Homo Erectus, and the Neanderthal Man (and other archaic African humans such as Homo Ergaster australopithecus afarensis, australopithecus afarecanus and Homo Habilis) must be questioned, and must be repeatedly examined and reexamined from time to time. This will also undoubtedly and unquestionably strengthen the bastion and the fortress of science, and advance the cause of science in societies where science is still viewed with suspicion or a while man's endeavour. In today's science, (and rather unfortunately so) scientists and scholars are sub-divided into camps, and there is too little done by the way of exchange, reconciliation and dissemination of ideas. The Out of Africa theory of dissemination of modern humans is often stated to be "proven" or "disproved" using mere fragmentary, insufficient or inconclusive evidence, and there is more often than not, a great deal of bias or inadequate thought leading to such assertions, than a careful, a dispassionate and a comprehensive examination or analysis of data. The criticisms of the Out of Africa theory are many. We will not delve into them here; it is the approach that must be severely admonished. The Author's great grandmother around the year 1920, referred to science as "White man's magic". Indeed, most people in India, Africa and elsewhere in the developing world admire the giant strides made by technology, but are suspicious of it intruding onto the cultural domains and spheres of activity. Denizens in Asia, Africa and elsewhere harbour a secret admiration to scientists in general, but remain skeptical or some of their claims. All their ideas and pronouncements not often liked or cherished, but at the same time, we must be forced to remind ourselves that nobody likes to believe in a falsehood or a lie.

That is indeed the undefeatable power of the bare and the naked truth; truth (along with openness and transparency) can change things in unimaginable and unexpected ways, and in ways that no other approach possibly and probably can. There is also a fear or causing an upheaval or a storm, stepping outside one's own zone of comfort, and stirring a hornet's nest, but the truth must be extricated whenever it needs to; this alone can bring about positive and meaningful change). Authors and researchers seldom imagine the downstream implications of their own research, and often a mighty empire and giant enterprise is built on a clumsy and a creaky edifice. Who will bring about change? Who will bell the cat? These are fundamental questions that need to be answered. There are other examples galore. For example, Witzel and Asko Parpola have been perennially at loggerheads with one another with their respective shady and suspicious Paramunda and Dravidian Indus hypotheses. Witzel for example, has managed to fool a generation of Indians with his shallow, hollow and egregious approaches just as Steve Farmer did with his non Indus script thesis; unfortunately, no one reacted meaningfully, profoundly or comprehensively enough.

Meaningless debates, rants and banters often continue unabated in the esoteric scholastic realm too. For example, the British Archaeologist Colin Renfrew has persisted with his egregious and flagrant Anatolian hypothesis, based on postulated or supposed agricultural expansions out of Anatolia during fantastically assumed very early times, i.e. as early as the sixth millennium before Christ. Debates may be necessary for the healthy progress of science, but are pretty much useless if one dogmatically and unbendingly sticks to his or her guns. Bad science won't even be possible if science is of a foundationally and institutionally higher and better quality; our approach can even lead to "institutional coherentism" of sorts, and this was a concept we espoused in a previous paper. There is unfortunately very little "institutional coherentism" to talk about in various fields of study; for example, Thomas Burrow spoke about "Aryans" attacking "Harappans" (often fallaciously assumed to be "Dravidians"). Not only were his ideas not questioned, but Indology was also clandestinely and surreptitiously sought to be dragged back in the direction of the nineteenth century to perpetuate vested scholarly and academic interests. Western scholars (the "orientalists") were often mollycoddled and cocooned from external ideas, thoughts and influences. Thus, there is too much done by way of theorization (over-theorization) and speculation, and too little done by way grounds up research and an empirical verification of facts and underlying assumptions. Similarly, an overreliance on archeological evidence alone for studying paradigms and concepts pertaining to various facets of ancient India (this can prove to be highly damaging and limiting) in lieu or robust interdisciplinary approaches is the bane of Indological studies; these should have been thrown out of the window a long time ago, but alas, this was never done earnestly or sincerely. [7] [8] [9] [10]

III. CLASSIFICATION OF LANGUAGES INTO DIFFERENT LANGUAGE GROUPS

There have been many different attempts to classify languages into groups over the centuries though the boundaries between so-called and assumed language groups can be said to be hazy and nebulous. Interest in language groups and classification of languages into real or imagined groups began very early and can be dated back to the life and times of Filippo Sassetti, though such endeavours got a boost when William Jones commented on the widespread

[7] Beyin A (2011). "Upper Pleistocene Human Dispersals out of Africa: A Review of the Current State of the Debate". *International Journal of Evolutionary Biology*. 2011

[8] Bosworth, A. B. (April 1996). "The Historical Setting of Megasthenes' Indica". *Classical Philology*. The University of Chicago Press. 91 (2): 113–127.

[9] *The Sanskrit language. Thomas burrow, Faber and Faber, 1955. ISBN 9788120817678.* (3rd edition, 1973; reprint Motilal Banarsidass Publ., Delhi 2001)

[10] Anthony, David; Ringe, Don (2015). "The Indo-European Homeland from Linguistic and Archaeological Perspectives". *Annual Review of Linguistics*. 1: 199–219.

and deep-rooted similarities between Sanskrit and European languages as discovered and announced by William Jones in Kolkata (then known as Calcutta) in the year 1786. Even though there may be more than a nugget of truth to William Jones' claims and assertions, downstream classificatory mechanisms may have been highly and grossly over-simplified, and highly inadequate. Conventional classificatory mechanisms of languages include genealogical classification (where languages are grouped by diachronic or vertical relatedness into language families), typological classification, (wherein different languages are grouped into formal language types on the basis of various formally selected criteria, and often according to their similarities in grammatical structure), and less commonly based on areal classifications (areal features are elements shared by languages or dialects in a geographic area, especially when such features are not attributed, credited or ascribed to a postulated common proto-language, or, a real, hypothesized or a speculated common language ancestor) etc. Such mechanisms were either extended to, or developed conjointly with Indo-European studies, but over-simplification, or ivory-tower approaches can do a lot of damage to practical science, and can produce unfeasible, unworkable and unusable concepts and methods too.

The spread of IE was so complex, it is purported to have spawned ten major linguistic sub-groups which are as below. However, the interrelationships between all these languages are not as easy or readily understandable as meets the eye. For more material and inputs, refer to out papers on ancient India. We are barely skimming on the surface, yet. Various classifications have been proposed by scholars such as August Schleicher, Vladimir Georgiev, E. Sturtevant, Ivanov, Gamkrelidze, Vladimir Georgiev and Eric Hamp. As per many or most of these language classifications, the Indic languages of North India or the Gangetic plains constitute one group, Iranian language form or constitute another group, the Romance languages of Europe are another group, the fourth group would be Germanic languages and the languages of the British Isles, the fifth language group would be Greek and Hellenic languages, the sixth language group would be Celtic languages, Baltic languages such as Lithuanian, Latvian, and the now extinct Old Prussian language would form the seventh group, the Slavic language would form the eighth group, while the Armanian and the Albanian branches would constitute the nineth and the tenth groups respectively. While some simplicity and easy comprehensibility is indeed desirable, over-simplification would be the bane of science. No classification or classificatory mechanism would be the be all and the end all of everything and can be set in stone. There are probably and possibly many complex interrelationships between languages and purported language groups, and more meaningful and detailed research must commence at the etymological level. Continuous zero-based assessment is a valuable and a potent tool and a weapon to do away with vested interests, and this will in turn increase meaningful, positive and significant scientific activity telescopically. [11]

- *The "Aryan" problem*

The so-called "Aryan" problem is undoubtedly and an unquestionably complex one. In a lecture delivered on 11th October 1999, at the Academic Staff College, JNU the Marxist historian Romila Thapar admitted that the Aryan problem was extremely complicated, and the most complex question in Indian history. She herself had rejected the over-simplified invasion model way back in the year 1969. Edwin Bryant, in his paper, "When Scholarship Matters: The Indo-Aryan Origins Debate by Edwin F. Bryant Rutgers University", likewise acknowledged the fact that the Aryan debate was an extremely complex one and required a thorough understanding of all issues involved and a castigation of "the ghosts of the pasts". Steve Farmer too, in an influential journal acknowledged the fact that all facets of the debate needed to be constantly assessed and reassessed but only on the "basis of evidence" and not a "desire to boost sectarian pride." Thomas R Trautmaan. Madhav Deshpande, Peter E. Hook and other well-meaningful individuals participated in the debate and rather earnestly so, at the beginning and the turn of the present century. A few were lauded, but most received brickbats. At the other end of the spectrum, the otherwise competent Indus archaeologist Gregory Possehl lived in a make-believe world, and exhibited some kind of a pompous naivety, refusing to get his head around the real-world complexity and the real-world implication of most scholarly issues and puzzles in science. This is a classic example of "good" helicopter science.

All this would remind one of the parable of the blind men and the elephant; this is an ancient Indian story dated to the Buddhist era some two thousand six hundred years ago. In this old and ancient story, a group of blind or blindfolded individuals try to imagine what an elephant is like by touching different parts of its body. Unfortunately, they fail to get the bigger picture, and cannot fathom what an elephant is like. All their meaningful efforts end in utter and complete failure. Some other researchers have dwelled on highly impracticable paradigms. Even an otherwise well-meaning and reasonably competent Indo-Europeanist, suggested or indirectly implied that it would take thousands of years for "Indo-Europeans" to travel from the "Urheimat" or the Indo-European homeland to the outermost reaches of the Indo-European world. Who in his senses would subscribe to this idea or this notion? People could have travelled that distance within a few months, even several thousand years ago. Way back in the year 2009, we had listed out several Indological ghosts of the past such as the 1500 BC migration hypothesis, Sir Mortimer Wheeler's dark age hypothesis, or the doubtful and suspect 1500 BC Indo-Iranian language split. Likewise, theories on the Indo-Europeanization of the world were probably highly oversimplistic, and we sought to remediate the same.

For further information and light on this issue, readers are urged to read part two of our paper on the "Indo-Aryan

[11] Witzel, Michael (11 October 2016). "Early Sanskritization. Origins and Development of the Kuru State". *Electronic Journal of Vedic Studies*. **1** (4): 1–26 Seiten

problem", our paper on the identity of the Harappans, and our two papers on the Indo-Europeanization of the world. Likewise, solutions and theories must be based on problems and experiences drawn from all around the world, but this has barely been realized in any western-centric approach. We must have healthy and mutually inspiring or encouraging dialectics, or what we had called CRCDE or continuous reconciliation of contradictory data or evidence. This approach can even find its ideals realized in science activism, and we look forward eagerly and enthusiastically to an age where other well-intentioned and competent scholars and scientists or even eventually the well-informed, educated and erudite public can demand as a matter of right, a list of all assumptions used in science and various scientific papers, and the methodologies used in science and scientific papers as well.

- *Theories on the origin of language*

We had revisited several early and previously proposed theories on the origin of language; these included antediluvian theories such as the bow-wow theory or the sound mimicry theory, the pooh-pooh theory, the ding-dong theory, the yo-he-yo theory, the yo-heave-ho theory or the social interaction source theory, the ta-ta theory and the chew-chew theory, the La-la theory or the woo-woo hypothesis, the ma-ma theory, the singing theory, babbling theory, the hey-you theory, among several others. Not only are these highly antiquated and outdated, these would also cast severe aspersions on the efficacy of science to reflect real-world concerns and considerations, particularly among the common lay man. Where else does one have to look for to find a better example of dyed in the wool and ivory-tower approaches or intellectual aloofness? We had proposed a theory known as the "Epochal polygenesis approach", and one can readily compare and contrast our approach with other pre-existing approaches to ascertain which is better. Marxist historians have also rightly scorched and arraigned Hindutva tendencies, but why did they turn a blind eye to colonial misadventures in science and scholarship? They have obviously hijacked the concept of objectivity perversely, and to suit their own perry ends, particularly hardliner dogmatists like D N Jha who may have even succumbed to a perverse kind of a communalism. If Marxist approaches are to be castigated, they must be severely admonished first, and this can only come about from a grounds-up assessment. [12]

- *Other relevant and pertinent examples*

We have never tired of showcasing the dubious and questionable case of Lemuria (a purported mythical homeland that supposedly existed to the south of India) as a classic example of the science and non-science debate. This is admittedly so because this idea and concept lies in the nebulous and the blurred boundary of bona fide science, bad or poor quality science and outright pseudo-science and non-science. Indeed, this idea was originally proposed and postulated by the zoologist Philip Sclater, and later usurped and appropriated by other non-scientists. Therefore, we reiterate, and will reiterate constantly and continuously that it is the approach, and the assumptions made that count, and not the academic qualifications or the claimed credentials of any practitioner of science. This principle would hold good for any discussion on the issues of science, non-science and pseudo-science under the sun.

Under the banner of science activism, and under the canons and fundamental principles of the approaches espoused in this paper, every paradigm and belief propagated under the auspices of science must come under severe scrutiny and constant examination and re-examination. This would hold good for issues in science that are placed as far apart as revaluation of theories that caused the demise of dinosaurs some sixty-five million years or so ago, theories on the claimed properties of any given extrasolar planet, estimates of the number of the stars in the Milky way galaxy, automotive safety paradigms including claimed safety standards (in various real-world scenarios in different parts of the world; validated with real-world data), assumptions and claims made by Marxist historians who may be as biased and prejudiced as Hindutva historians, and may, owing to their ideological tendencies, resort to anti-intellectualism. Likewise, Assumptions made by Dravidian nationalists and supported of the Dravidian Harappa hypothesis must also be put to the lens, and every acid test conceivable. Of course, all claims, allegations and counter-allegations must be constantly evaluated and reevaluated literally till the cows come home. At the same time, all antiquated shibboleths and pernicious beliefs must be consciously brought to the chopping block.

Other concepts (with a natural potential for rampant misuse) that must be brought under the scanner are the concepts driving IQ tests such as the Stanford-Binet Intelligence Scale and the Wechsler Adult Intelligence Scale, the claimed links between IQ and race, (such as the perverted use of the Stanford-Binet intelligence test and work carried out by Audrey Shuey and others) or even claims linking IQ and fertility or "race" and fertility for that matter. As always, correlation does not imply causation. Western-centric scholarship may also be shallow and limited in its own way; multi-cultural scholarship based on mutual understanding and mutual respect may be the way forward for healthy and holistic science. Other than ubiquitous criticisms of palmistry, astrology and claimed extra sensory perception (the efficacy of the latter may be uncertain, but by no means impossible) even mundane statements and assumptions can be constantly analyzed and investigated. For example, the statement "will electric cars replace internal combustion engines?" must be answered only by a thorough and a holistic assessment on a range of issues such as the possible future scarcities of lithium, child labour allegations associated with cobalt mining in Congo, the anticipated trajectory of the development of sodium ion batteries, among several other allied and related issues.

[12] On the origin and spread of languages: Propositioning Twenty-first century axioms on the evolution and spread of languages with concomitant views on language dynamics Sujay Rao Mandavilli ELK Asia Pacific Journal of Social Science Volume 3, Number 1 (2016)

As a part of this effort and exercise, a continuous zero-based reassessment or real-world observations must also be carried out, and this may involve identifying early or lead indicators and red flags as well. We therefore look forward to an entirely new class of scientific research manifesting itself in the foreseeable future, and future mainstream researchers, scholars and intellectuals must drive it. This must be especially performed if previous studies are imperfect or flawed, and if there is any scope for improvement.

Twenty-first century science, particularly social science, must be driven by people from all of the world to eclipse and erode vested interests, to jettison myopic and blinkered approaches, and to do away with parochialism as well. Social sciences must be and remain one of the fundamental pillars intellectualism and science in general must be based upon, but alas, the field has failed to live up to its potential, purpose and objective. We must also bear and keep in mind always the principles of a holistic assessment, and confirmation holism. If assumptions cannot be fully and completely justified and on all counts, they may qualify as pseudo-science. Thus, there must be a link and a continuous chain of activity and thought between scientists, researchers, investigators and the layman i.e. all stakeholders and beneficiaries of science must be brought into the loop. Researchers must also always be conscientious and diligent and must be answerable to the general public on all valid counts. Change must also be brought about fairly rapidly and quicky. As Leonard Bernstein states, “In order to achieve great things, two things are needed, a plan, not quite enough time.” As an extremely useful and productive metric or a measure, “QEPIS” or “Quantification of the effects of poor or Ideologically-driven scholarship” (This would refer to the intended or unintended downstream (both primary and secondary) and adverse effects of poor, and ideologically-driven scholarship or the continued persistence and manifestation of old, obsolete, and badly antiquated approaches) may also be measured, computed and calculated from time to time including its natural and inevitable bearing on various other fields sciences and on society in general. This was a concept we had introduced in an earlier paper “Historiography by objectives”, way back in the year 2015.

IV. CONCLUSION

The approach conceptualized, described and advocated in this paper may initially appear to be highly conventional and non-radical but it has plenty of substance to offer to the healthy pursuit of rigour, dispassionate objectivity, and healthy and balanced scientific activity. We do not aim or propose to put or set the cat among the pigeons or create an unwarranted or unjustified flutter that could potentially rattle and alienate scholars, but instead create in the medium and the long-term, a healthy, an infallible and a dedicated enterprise devoted and dedicated to the constant grounds-up and bottom-up assessment and reassessment of assumptions (both explicit and implicit), methods, methodologies, tools, techniques, hypotheses, processes, procedures, frameworks and paradigms, including all legacy and archaic methods, methodologies, tools, techniques, hypotheses, processes, procedures, frameworks and paradigms such that an intrinsic self-correcting mechanism can be forged to channelize science and scientific activity in a meaningful and a productive upward trajectory, such that scholars and researchers do not blindly swim with the current or the tide. Needless to say, we expect this to lead to faster scientific progress as well, and serve society as a whole both beneficially and meaningfully.