On Telling Untold Stories: Semiotic Substitutions for Wonders in Scientific Legitimations

By

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> . . .a scientist, so far from being a man who never knowingly departs from the truth, is always telling stories in a sense not so very far removed from that of the nursery euphemism - stories which might be about real life but which must be tested very scrupulously to find out if indeed they are so.
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> Peter Medawar, 1960 Nobel Prize Winner in Medicine,'Pluto's Republic':40.

If the saying "Men always know more than they can say" is true, then it is understandable when our attention is called to the caution to be watchful to the "other things" left unsaid when an idea is expressed. While this may not be an isolated experience, this bipolar perception seems more pronounced in the specialized community of scientists. Werner Heisenberg (1958:167), commenting on "Language and Reality in Modern Physics" in his opus *Physics and Philosophy*, writes "that one has not yet found the correct language with which to speak about the new situation and that the incorrect statements published here and there in the enthusiasm about the new discoveries have caused all kinds of misunderstandings. This is indeed a fundamental problem." In this article we hope to explore the rich *landscape* of this felt and urgent need to translate the subculture language of scientists so called into the more universal sphere where the scientist is drawn to and orbits in the worldview of a poet and a humanist in the broader sense. Hence, the scientist evolves according to the comprehensive sense of the German *'Wissenschaft'* which assumes the territorials of social sciences and the humanities. In this

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sense, science ceases to be a superstructure over the socioeconomic base reality, to paraphrase Alvin Toffler. Science seeps osmotically into the very life-synergy of its consumers and the interactive breathes a unique *hybrid* of a metaphorical character which vibrates the historicity of usage and currency, anchored on scientific expertise and enfleshed by audience receptivity, dwelling on constructs that are, towards constructs that probably will be. Language here should be taken to comprehend the parameters of both verbal and non-verbal scientific culture within the larger framework of society.

I. A Fundamental Problem

The selective economy of the empirical data induced by the scientific usage of sophisticated mathematical tools may understandably relate to a highly specialized community of experts who 'speak' the same language but who oftentimes need time and the congruent concepts to decipher a peer's findings. To broaden the spectrum and acceptance of such scientific findings, and ultimately, to fertilize the intelligibility of a canonically accepted status, some mental and verbal choreographics need to be pursued.

When H. Gordon asked Albert Einstein (Introduction, *The World As I See It*:VII, Trans. Mein Weltbild) to define his theory of relativity in one sentence, Einstein replied that it would take him three days to give a short definition of relativity. The obvious implication serves to intimate the prerequisite of more than an acquaintance of mathematics and physics if such definition could at least be comprehensible. An opus which took a lifetime to accomplish will probably require the disclosure of the very life of the scientist to approximate the traces of time and elucidate the fluency of the specific jargon.

If definitions were set to serve as the hallmark of signification, the issue on demarcated meanings is not assured respite from a continuing nagging dilemma, regardless of whether such definition is installed on an *ante hoc* or *post hoc* basis. Despite attempts at the security of a more precise option, definitions inevitably involve the 'agency' of concommitant concepts, the corresponding meanings of which can hardly be taken for granted if definitions are meant to induce the precision for which they are deemed to signify. It goes without saying that the inherently operative nature of science presumes the inextricable hypothetical motives and intent of its propositions. This means too, that the historical and cultural underpinnings of the said term are taken into consideration so that the evolution of meaning is traced in a more integral contextual form.

Familiarity with the rigors of the logical and the algorithmic forms and skills serves well certain intents and purposes. Indeed, this rigors of laboratory experience can come very useful and handy as necessary

prerequisites and background when the research scientist begins to dwell on the inevitable non-algorithms of mental experiments which are formally extrapolative. 'Familiarity' is a highly charged functional quality of a scientist which operatively precedes and perhaps overlaps, without necessarily equating, with the evolving status of scientific 'expertise.' Scientific 'expertise' is the social recognition of 'familiarity' which is substantively personal.

II. From Hands-On to Heads-On

Such is the case of an 'evolving' and 'maturing' man of science. He trespasses the 'hands-on' to the 'heads-on.' But the complexity of the process 'human conversation' seeks a transcending 'language of forms' over and above and beyond what may be a school-contrived formal language. Familiarity involves a mutuality of recognition approximated by frequent committed encounters, and affirmed and nourished by an ongoing knowledge and reflection.

By dint of the microscopic events which theoretical physics for example occasion, symbols and symbolicals beyond the formulaic constitute the interfacing art form which responds to this highly emergent and tenuous cognitional requirement. This aesthetics absorbs and subsumes the facts, and the mathematized relations bond the facts into a woven symmetry of intelligibles. The correlation is represented in a 'visual' form or image, as the 'connotatum' of what is accepted as a 'scientific language.' The symbol reflects a canny precocious nature as it exhibits a prognostic fertility of both the possibles and the probables. In a state of complementation with other symbols, a series of definitions and axioms can be read out. A return to an 'ordinary' form of language is effected when the reductive form is fleshed out back into its natural law habitat.

With the interminable advancement of science, so too does the advance take place with regards to its language and vocabulary. This effects the possibility of furthering consequent derivations. Reason dictates then that the corresponding philosophy of science keeps a meticulous evolutive attitude of historicity on its science as its generative focus for root justification and relevance.

In Heisenberg's "Understanding in Modern Physics" (*Physics and Beyond*, 1972:29), he is not so much worried about the predictability borne out of a mathematical framework, as much as he is worried about being "cheated by the logic of the new mathematical framework." It is one thing to know the theory in one's brains, to "understand" the theory in one's heart is altogether another matter. To enflesh high-power calculus in a more familiar theory-laden framework of what we already know is the more sublime goal of any rigorous research of phenomena. Derivational process which certainly has its limits when made operative does not

necessarily connote 'true' understanding. Analogically, scientists have their own equivalent to what musicians speak about 'caressing the musical notes.'

III. The Transcendent in Context

Ptolemy for example, following Hipparchus' objection to Aristarchus' positioning of the sun as the center of the planetary system, posited the alternative assumption that it is the earth rather which occupies this center. Despite this assumption, Ptolemy's predictions of the eclipses of the sun and the moon were so precise that these predictions became the hallmark in astronomy for some fifteen hundred years!

It was Newton's law of inertia and idea of force that was later to provide the correct explanation of these motions of the planets on the basis of gravitation. To understand nature may mean being able to decipher and to decode the inner relations which conjunct data and correlating these relations to a larger matrix, indeed to wider horizons. To understand nature may actually demand more than the mere analysis of the events via some cloistered intellectual framings of systemic categories. Rather, this may entail the scan and the sense of the 'inner tension' on which the wholeness of nature vibrates and bifurcates.

A culture within a culture, or a subculture of sorts develops its own language engendered by the inherent abstractions which are fertile and evolutive. Expectedly, the mutual collusions between the 'doing' science and the 'talking' science lead to a new hybrid which takes off and cruises beyond the generables of the dimensional and the circumscribed. This assumes a different and distinct character percolated within the community of scientists.

Abstractions beyond the inductive level facilitated by mathematics obviously attain precise configurations required of a derivative fruitfulness. In this increasingly digitalized events, the communicated signs must keep pace as we have pointed out earlier. This is evident in the general relativity and in quantum theory for example. Bohr's concept of complementarity for example can in no way be described without the attendant double-edgedness of the principle of uncertainty. This substitutionalism in language adaptation devolves on a seemingly pedestrian modes of communication which aggrandizes a large measure of metaphorical sense and poetic forms. Such modes of more plasticized responses, of proportion and contrast, provide the symbols the breathing space for prognostic ruptures signaling further tendencies and possibilities. These signals of tendencies and possibilities constitute the very essence of all interpretative efforts of which semiotic activities are based. The tenuous character of this phenomena ignites the artistic instincts which craves to intuit the extraordinary behavior of nature that feeds and nourishes the life of a scientific community.

Be that as it may, the indicator that signals that an understanding 'by the heart' has taken place occurs when this localizes in plain verbal packaging. It does not suffice that the scientific calculus is comprehended by one's peers alone.

An acceptance which transcends the private confines of one's intimate peers is every scientist's dream, though this may not seem possible in every case. Contextualizing a microscopic unobservable within a larger framework of its macrosystem for example enables the correlation being transmuted into more sense-laden terms. When necessary, gestation of the term is even more facilitated by focusing on the empirics of actions and observations involved in the specific experiment. Obviously, this operation aggrandizes what is most feasible or what is the best option with the given situation, but nonetheless leaves the event sorely delimited and distantiated from the ideal. The translation of creative signals to its various tangible forms negotiates inextricable limitations.

Adaptive changes further occur when more data enter the original framework and the previous term either assumes an expanded meaning, or new terms are introduced and may function as extension of ordinary language, e.g.,the terms energy, electricity, and entropy. Indeed, time factor referees the acceptability of both the fluency and currency of the term within the scientific circles. This may not be an easy variable to handle and control, unpredictable as it is, as experienced for example in the term 'electromagnetic field'.

The term 'electromagnetic field' was initially coined by Faraday and later served as the core idea of Maxwell's theory. The prevailing scientific atmosphere was simply not conducive to facilitate the radical change from the concept of the mechanical motion of matter to the suggested electromagnetic nature.

Language use becomes more tedious as experimental data gets to be more complex as in the case of the theory of relativity involving the limiting case of small velocities. The principle of proportion and contrast teaches the 'talking' scientist the moral that we cannot be an unyielding dogmatist and fixated over guiding principles so called in the historicity of scientific language. This suggested open-minded attitude comprehends both the what and the how aspects of the candidate term. History and historicity of term usage in science, as it is probably true in other areas develop like its user, man in society. It is a living development and growth. Factors which direct their evolution are anything but predestined; the occur and they are deciphered.

Indeed, this situation illustrates the inherent demand of 'reality' to transcend logical forms and set patterns. Rather, a pictorial language form is called for which intuits the relations involved in the samples and attempts to spell its overall suggestive fuzziness. This approach seems to sit comfortably with an event which is fundamentally non-algorithmic.

Such effort is sustainable if the adopted language is both adaptive and versatile to the varying strata of meanings as Hanson (1973: 125ff.) illustrates his various patterns and modes of "seeing". With this multivalent, amorphous recognitive options, the language demands and seeks for the unstructured and the uninhibited, the contextual and the transcendent. This involves the human process of mimesis.

IV. Mimesis as Reality

Mimesis or 'imitatio' in its earlier form of usage refers to the astronomical and heavenly bodies and their motions. It refers to a different kind of knowledge which supersedes the limits of the senses, the already-known and the all-too-familiar. In this sense, it is relational and representational of what is not fully given and therefore not fully known. Within the relational and representational operations, a transformational process takes place whereby, like Janus, the two-faced Greek god, the mimetic form could look back to the source of what it is representing and look forward to what it is meant to project. An actuated revelatory form is constituted between these parameters. The idea of mimesis therefore comprehends the process and product of 'relatio' of its 'relata,' leading to a worldview of a 'kosmos' and the transformational carrying over to its 'kosmios.'

That the relationship between the 'relata' and its consequent 'relationes' is by no means facile is illustrated in the varying distantiations between idea and appearance in 'Parmenides.' The conjunction is pregnant as it is volatile. Ambivalent situationers such as: 'parousia' (presence), 'symploke' (interweaving), 'koinonia' (coupling), 'methexis' (participation), 'mimesis' (imitation), and 'mixis' (mixture); all provide distinct modifiers in an attempt to isolate a characterization of a situation which by nature refuses any simplification at all. 'Mimesis' seems to be of Pythagorean inspiration involving the object-number relationship as exemplified in the order of the heavens and in musical harmony. It presumes the existence of the referent being, the source of imitation and representation. 'Methexis' on the other hand, serves the purpose for establishing the common referent that connects the many to the one, which the Pythagorean number-being relationship is not implied. As instigatory of the doctrine of participation, 'methexis' implies coexistence of things, of the unique coexistence of the parts through appearance. Within this open parameter, the principle of substitution is operative where a problem may find its solution in a transformed or transmuted state. Whatever and however that solution comes to be, the mixture is composed of the limited and the unlimited, in short, a metaphor suggestive of discourse and dialectics.

Mimesis despite the mentioned limitations, constitutes a viable medium of a metaphorical proclamation of phenomena as approximations of the inherent mathematical relationships that found appearances. In science,

it is a nurtured equation that engenders between reason and nature, a mediation between the one and the many, between the metaphor and its constitution.

V. The Optical Perspective

In the recognitive process of the 'representatio,' a very curious intervening factor which hovers and continuously imparts a strange 'binding' influence is to be noted. In Greek thought, this was encountered in the myth. Otherwise, it was a mysterious element which spelled the difference that effected intelligibility for all since it worked like a universal heritage and tradition. Because this factor of intelligibility works by being a background of thought than actual thought itself, e.g., the props of the drama than the performers themselves, this notion is oftentimes termed hidden or unconscious philosophy, memory of a race, philosophy of life, atmosphere of the mind, etc.

These are F. Cornford's (1967:1ff.) terminologies for such an intriguing phenomena.

A writer, either as a historian, or as a philosopher for example, or even as a dramatist, with all the best of intentions to project his material with avowed objectivity will not be able to discount the omnipresent tendency to draw and impart certain points of emphases, highlights and significances which salient some facts over others. Preconceptions have cunning ways of entry into the written word which betray authorial positionings and posturing subject to elements which are innately human it seems, of being subject to the "laws of his optical perspective" engendered by some kind of a "proto-hypothesis." It is a transformative encounter between the external world which does not present itself to us as a sterile and an anaesthetic event devoid of its highly adaptive distinguishing properties, and the subject's perception which is anything but a virginal case of a simple retinal reaction.

To define scientific truth as the correspondence between the reacting subject and the reactivated object appears to provide the more telling modifiers wider area for confirmation they demand. This may help prevent the sweeping impression that truth comes to us as an occurrence rather than worked out and sought for. For the Nobel Prize winner for Medicine Peter Medawar (1990:53), scientific truth is by its very nature "very advanced, very grown-up." It goes without saying that the modifier 'scientific' addresses the cardinal importance of the nature of this awesome adjectival responsibility. It goes too without saying that such truth that formally resides as a human acquisition is a product of a dialectical story.

Scientific Tradition then goes beyond the currents of an immediate and contemporary peer influence as Heisenberg might seem to imply.

In either substance or style, or both, history of science points to a distilled 'atmosphere of the mind' which refers to a long established shared 'ethos' of the indefiniteness of the scientific task. This is the ontological open-ended nature of this Tradition layered through generations and contemporaneously personified by what Einstein calls the creative individuals who catalyze the incarnation of the upward development of society. This atmospheric-like Tradition rejects the facile inertia of self-sufficiency and fixations which are antithetical to the very nature of science itself and to the truthfulness of being *scientific*.

If as Einstein believed that our theories shape the facts, and Heisenberg considers the 'problematic' guiding the data, Hanson affirms that "the 'conceptual shape' of one's theories, the posture and stature of one's presuppositions, determine how observations have to be 'cleaned up,' where they should be realligned and reprocessed effectively to be plugged into a science's theoretical framework, its structure of intelligibility. This means that the more tried and tested starting point of the scientific enterprise is the scientific theory or hypothesis, and not the 'samples' as we are wont to argue. In this sense, theories or hypotheses as products of critically imagined reasoning undergo the existential process of storytelling, of stories of examined and experimented encounters with nature. Indeed, a story is a more candid description for an autobiographic quest, of what is actually a human drama, but which otherwise is not fully narrated in the distilled scientific report so called.

Veritably, it is not the "eye which sees, it is people who see." "It is a contribution affected by inference from his past experience, his memory, his training, and his knowledge." In the context of Heisenberg's difficulty between 'knowing' and 'understanding,' here comes the recurring problem between the intellect that figures and the heart which configures. It is a more intimate philosophy that develops within a larger concentric sphere operating in a synergistic confluence.

The awesome expanse and depths of the 'memory of the race,' the mode of influence it vibrates and breathes, the autonomy it asserts from direct justification, and the generational plasticity of its survival, seem to provide us with certain anchors that will contend with the nagging question why there seems to exist such stonewall resistance to any explicit formulation, a phenomenon which leads to lively debates no doubt, but which elusiveness intrigues its students to sustain their pursuit of the cognitional prey. In a seemingly genetic fashion, this particular 'memory' intrudes in a non-rational style and yet promotes the rational process with the necessary props that are already considered native and natural.

Still yet, it is precisely on this 'unwritten' but rather non-rational status that this hypothesis finds its weakness and strength. Positive scientists for example who labor under the thinking and outlook which

Yukawa' (1973:70ff.) describes as the refusal to "believe anything that is not verified, and the outlook that will discount nothing that was not verified not to exist or not to have happened" may react quite predictably to this notion. Such scientism obviously tolls the knell of the life of science itself. The scientist with all the controlled ethos of his profession is never immune from a universal experience which, in varying degrees and intensities adaptively confronts, shapes and contours one's membership in this one common denominator we call humanity.

Reason as the very substance of humanity is gripped and awed by the 'living memory' and the 'continued personality' of the immensity of the shadows of universal causation and the harmony of natural laws. As it was with Thales, or Aristotle, so was it too with the likes of Galileo, Kepler, and Einstein. This inexhaustible elements of wonder and mystery encasing Gadamer's 'fusion of horizons' of man's memory and heredity, of man's religious and scientific capacities, engender his innate tendencies to extrapolate into an 'homo religiosum' on one hand, and into an 'homo scientificum' on the other hand. No doubt such distinction may later remain to be a matter of the mind, as the scientist metamorphoses into a worshipper and vice versa. Science then, may be deemed as man's mute attempt at getting nearer to the rationality of his beliefs and to a firmer conviction of his reasons.

Thus, it is not all surprising that the same substantive 'problematic' may recur and persist, thereby recalling a solution that is at its depths equally similar. Like a collective 'understanding', the memory functions to enlighten coherence and consolidation of events, a sense of teleology to an intuited order. They are some kind of filtered expressions of 'preserved affections' for selective memorials which induce some deep instincts as distinct centers of his psychology and physiology. The difference lies, it seems, in the variegated adaptive, selective, and derivative historical nuances. To discount a common alpha of beginnings may practically leave this uniqueness of the individual, bereft of its omega, a babel of subjectivities which is no longer explainable on the absence of a point of collective referent we call the reason of reasons. In our particular context, the inference could appear more ominous. The task of the possibility of the transmission of representations, symbols and images faces its greatest mortal threat: an unnatural vacuum artificially borne out by the denial of a collective thesis which provides space reserved only for a collective ground of intelligibility encased in a collective ionosphere.

R. Harre' (1981:22ff.) theorizes on the notion of a representative or surrogate figure which mediates between ignorance and the unexperienceable. The mediation comes very handy and indeed necessary in situations which are beyond the reach of experience, but nonetheless grounds the possibility of knowing. Nature is conceived in its temporal becoming andin its spatial symmetry. Within this theoretic 'institution,' scientific theories are illustrated by empirical evidence which undergo an

anecdotal transformation, so to say. An anecdote pictures and illustrates the theory effectiveness of making varied phenomena intelligibly coherent. As an anterior symmetry, a scientific icon validates our world experience into a rational whole, an intelligible worldview. From this referent point, the patterns and regularities acquire a 'meaningfulness' which in themselves would be unattainable, and by themselves, will forever remain a mere concoction of cold facts and data.

It was Einstein (1914) who said that "the individual empirical fact is of no use to the theorist." A sentence states, an icon communicates, shows, and transforms. An icon arranges and designs to enable it to represent. A sentence merely refers to its own conventional characteristics. As pictorials, an icon is both a declaration of a reflexive and reflective copy, an `imitatio' which engages in a transformative conversation in its function as a referent 'representatio.' It transforms the anecdotes of significant observation and relevant data into an interfacing relationship on the basis of an "intelligible framework of what we already know" as Hanson observes. This "framework of what we already know" leads to a referent which partakes in different levels of familiarity specially that which pictures a "possible being which behaves analogously to the unknown real being" which is the icon in Harre's context. The concept of objects which is yet unknown is made possible through various degrees of depth of the analogical process facilitated and mediated by likeness and similarity. This is, in short, a reproduction of an unknown based on the real existent natures making possible recognition and understanding of specially, structures and dispositions. In this sense, icons are deemed and constituted as metaphors since they breathe meaningfulness.

VI. The Poetics as Mimetic

The POETICS of Aristotle (51b, 27-29) considers actions as the object of mimesis. The verbal contrivance are so concocted to picture the 'making up' of events which evokes a distanciation from the facts. Verifiability or falsifiability with the source 'on' which the representation stands 'on', is not at issue. The deployment of the genres such as the epic and tragedy for example, projects an agenda beyond their literary confines. The artistry in language is a tool or an instrument for a larger end, e.g., to induce the 'proper' pleasure so to say, as a product of the objective of the performance.

Perhaps, a more cogent emphasis of this objective lies in Aristotle's distinction between 'events which have occurred' (51a 36-37,b4) versus the 'kinds of events which could occur and are possible by the standards of probability or necessity' (51a 36-38, b5). The accounts of the past is the task of the historian, and the divining of the future is the vocation of the poet. On the basis of the coveted universal, the poet is deemed superior to the historian who busies himself with his materials of particulars.

Aristotle's poetic 'universal' seems to be a curious creature of sorts. The possibility of the occurence of events is grounded on the standards set by probability or necessity. The basis on which the standard is firmly anchored, indeed a cause stronger than the consequence of possibility, is the overlap of probability "or" necessity. It seems safe then, to infer, that probability already speaks and safely predicts of the emergence of necessity in no uncertain terms, if at all we are hesitant to place both events on the same footing in the same equation. In a parallel manner, the idea of 'necessity' must metamorphose out of the conventional mode of a hard and fast measure. This 'kind' of necessity obviously must assume a plasticity of form to perform its adaptive and versatile function. By contextual implication, the suggestiveness emitted by the overlap jibes with the innate active state of performance as proper function and the vigilance entailed in the production of the distinct effect of 'proper' pleasure as goal and orientation. The fundamental dynamism of the process and product of this 'universal' must be kept in mind if we are to sustain the essential intonation of what Aristotle emphasizes as being composed of a 'kind' of speech which belongs by probability and necessity to a certain 'kind' of character (51b 5-9). This is a reaffirmation of the evolutive need of speech for it to serve as an effective tool in the proclamation of the unique representation about the unseen and the yet unknown even in its most approximative levels.

The analogy set in the Poetics between the play and the development of an animal establishes the 'kind' of necessity that befits the 'kind' of character. Both instances demand a type of necessity that is malleable to the constitution of the events that 'could' occur. The grasp of the 'possible' intimates the insurance of the events that will have to be conjured earlier in time to ascertain the taking place of the 'possible.' The arrangement of the plot as well as the growth of the animal seeks for an ordering of the events that must ultimately be responded by a reaction of understanding and intelligibility. It is in this sense that the events will have to be served with probability and necessity without being constrained by the 'possibility' of unexpected events happening. But this turnout of the unexpected is normally an exception and the rule is to enlighten and exhibit the universal ingrained in character and conduct.

In the definition of tragedy (49b 24-25;50b 23-25), an allusion is made to completeness and wholeness and of a certain magnitude, which on the other hand pictures an animal morphology that is mature and fully-grown. The possibility of such parallelism hinges on the 'life' that is born in an animal and the 'life' that must be 'born into' a play, the completeness of which must be like a living creature at a specific stage. The reference to a 'certain magnitude' remedies the seeming requirement of a terminal stage of growth and coheres with the 'appropriate scale' (50b 34-51a6) which addresses the requirements of perception. Perception

veers naturally towards the beautiful, and the beautiful correspondingly must possess the 'size and order' that perception interfaces with.

The 'size and order' as the appropriate material for the perceived beautiful correspondingly conjuncts the elements of intelligibility and emotionality. The whole is affirmed as the parts are interdependently ordered. The substance of reason orchestrates the reason of the substance of heirarchic arrangement and design (51a 31-35). Like the anatomy of the parts of an animal body which has every sufficient and necessary reason for being constituted a part, likewise is the requirement of the plot-structure as the mimesis of action of a play. In both instances, a part which cannot be sufficiently justified becomes an obstacle to the percolation of the whole. If nature meticulously edits the animal body, so should the writer his play. The beautiful thence is an unfolding, a reinforcing process which rejects as it accepts, which molds as it transforms, the object and the subject. The beautiful as the product of a processive process of reflection may now be considered an objectivity which has been subjectivized. It is now a human property distilled for the pleasure not only for himself but more so, for his coheirs of such a sublime humanizing factor. As a necessary consequence, the beautiful must evolve into a proclaimed representation of truth. The beautiful so called that is kept private and personal loses the social signification which the beautiful demands and commands. Otherwise, the 'retrospective universal' is neither a universal nor has left its imprint of a retrospect, e.g., as a product of reflection and discernment.

If indeed the representation must transform to a wider audience, it is because such 'universal' has engaged the faculties which are basically human (48b 4-19). The societal extension of the innate function of reason to represent is as essential and indeed more perfective as it is to represent. Pleasure enjoyed may be broken down into two. These are the pleasure due to learning from a likeness qua representation of a familiar original and the pleasure due to particular aspects and unique contours of the representation.

The former pleasure which originates from a 'familiar' when considered incites the ready objection that the learning and the inferring process that takes place does not entail the challenging input which occasions the corresponding intensity of pleasure. Such objection is granted if indeed the modifier 'intensity' of familiarity as not stratified, is conceded. Surely, this is not the kind of moderate realism that is to be expected from the author of the Poetics. Learning and inferential thinking is largely a personal endeavor and does not rule out the incidence and the all too possible occurence of non-algorithmic and unconscious type of 'syllogism.' The individual therefore seeks for his own center, and this center is anything but uniform for all. This is not to sink into a kind of relativism. This simply addresses the reality of the uniqueness of personal processes though given the same substantive natures and objective materials. Even

with materials that might be considered repugnant, learning itself is considered as enough reason for its being. And learning from representations seems to be the best way, if such representation were done with precision, because it is the most natural way to man. A representation allows individual adaptiveness and selectivities as it creates a substitution in the most 'faithful' manner possible in the context of his ingenuities and capacity to dematerialize. In this sense, a replication is not a work of art. It is a mere mechanical copy. A representation shows what others do not see, declares the fine prints and even rearranges the conventional into a self-renewing mode of beingness. It is a continuing process of recognition with the prefix 're' raised to an endless nth power.

VII. From Numbers to Forms

The scientist is like an artist. In a sense, he becomes one when according to the words of Einstein (*Principles of Research*, 1934:224-227) during Max Planck's sixtieth birthday, he "tries to make for himself in the fashion that suits him best a simplified and intelligible picture of the world; he then tries to some extent to substitute this cosmos of his for the world of experience, and thus to overcome it." "This is what the painter, the poet, the speculative philosopher, and the natural scientist do, each in his own field."

Heisenberg considers this spiritual evolution of a scientist as the 'journey to the interiors of abstraction.' In this worldview, his 'Weltbild,' lies his 'Character' which is an appropriate life-expression of his thought-diction. Like an artist, he deliberately chooses the elements in Nature as e.g., electromagnetism, that exhibits and signifies an organization and confluence of forms of energy.

That nature is written in mathematical characters is a belief inciting wonder since the days of the pythagorean community up to our times. Through mathematics, the language of nature's conduct and relations are arranged and ordered, movements are plotted, and scientific truths galvanized and installed. This illustrates nature's movement and metamorphosis from *numbers* to *forms*. This is nature's proclamation of the reign of science over scientific method, of configuration over figures, of wholeness over parts. Peter Medawar asserts that science is that form of poetry in which reason and imagination act together synergestically. It is in short, a declaration of conditional independence from space and time. In its purest form of glory, it is the eternal equations regained. It is Art conniving and colluding with Science sans its conventional logic.

Such equations are not stifling terminal dogmas. They are choice directives for exploration, an invitation to engage in what is unquenchably nature's 'inner tension' and 'tenuous balance' to liberate this man-nature relationship from epistemologic hardening. This involves a metalanguage which 'describes' rather than 'explain,' for to describe phenomena in

physico-chemical language is altogether different from explaining such phenomena in the same form of language. It means the radical shift to an imaginative form of expression which art form the scientist cannot be taught with, but which he progressively learns and imbibes as in the process of osmosis. Such choice made dwells on a determinate sorting out process which at times sacrifices completeness for the sake of deductive fertility and descriptive coverage of the proposed theory. With the universal elementary laws as the objective, the road to attain such objective is altogether a world by itself. The path is all but logically paved. Einstein points to the aid which 'intuition, resting on sympathetic understanding of experience' as the persuasive attitude which identifies the most probable construct in the field of numerous possibles. The choice is guided and strengthened by the force of argument which the most probable proves its might by its own merits. Conversely, this osmotic process follows the modes of the Law of Conservation of Matter and Energy. More than the 'interconversion' between matter and energy that is intimated by the law, the 'entropial purity' is targetted. This regards the economy of thought and expression which ignite and energize understanding by endothermic suggestion and mirroring. And more than the act of reflecting, it is a consummate act of conception after a period of historical gestation on the 'pre-established harmony' which the world of facts is already suggestive of. The knowledge of science ceases to be knowledgefor its own sake. It is meant to satisfy an interest and wonder that is magnetized by the most possible among probables. It is not a simple case of reading what is seen, but seeing the subtleties of why it is thus read out. These ethereal subtleties are spiritual entities embodied in indigenized metaphors which shade a spiritualized range of meanings and interpretations.

VIII. The Metaphor as Semiotic Form

The metaphor as a prophet of what is to become proclaims a revelation of an expectation. As the artist's trumphet, this may extrapolate the extensive tendencies of matter. It creates the emphasis which disposes the conventional relationship between the noun and the verb. Nature is then taken as emblematic for both the fact and spirit of the fact. The fact is represented by the mind and the mind projects its word through such representation. Such analogies have come down to us as some forms of 'natural constants' of the story of human conversation. It is not surprising to find sense in the visible having its figure equivalent, and the issues of the spirit being conveniently represented by facts of nature. Such intimation of the unity of the processes of nature and these processes interfacing with a reproductive familiarity in the mind conjures the rationale behind a well-ordered metaphysical expectation for an encompassing form of 'Weltbild.' In the economy of the 'Weltbild,' the poetics of Form coheres. The blocks of matter are reduced to a consistency which unmasks the lines of force and energy which integrate at its core.

The scientist is an artist because his whole science is an art. Such art form can be gleaned even as early as the hypothetico-deductive stage of the experiment, proving the fertility of the 'doing' science in spite of initial algorithms. The analytical chemical methods for example, display a semiosis of signal processes and signs. Signal processes are assigned as analytical signals to the material to be analyzed. These analytical chemical signals emanating in the form of spectra, titration curves or chromatograms are interpreted as chemical 'meanings'. Though the intent of the analytical chemical acquisition is meant to prove, what we obtain is an implication, not an equivalence; the inference is plausible, not a conclusion; the information is credible, not certain.

Such diagnostic system consists of signal production where signals are matched to a material. The signal interpretation then produces an indirect inferred information.

It is not remote to imply that the given substance and style of nature connote the world of nature to be a metaphorical reality to the human mind. Then the essential language of the scientist in terms of representations of scientific interpretations is largely metaphorical to say the least. Regardless of their specific and determining modes of intersubjective activities, the scientist and his circle of practitioners undergo and experience similar consensual processes whether these be verbal or nonverbal.

To ignite and to energize some 'health' credentials of the 'representatio' of science, the built-in character emanating from the anterior evaluative process which predicates lines of action should be noted. This potential state in the ' representatio' constitutes its oughtness, crucial to the interweaving of the relatable samples. Consequently, the verbs explicitating the activity of the subject defines the subject itself. When this dynamism is no longer evident, when the imagination is no longer fired, or when the instincts are no longer moved, the 'representatio' has lost the 'freshness' of a figurative. It has become a strong candidate to a literal existence, a mere figure. It has ceased to transfigure and to transform.

This is too akin to the contrast between the Gadamerian (*Truth and Method*, 1989:XIII) distinction between 'Erfahrung' and 'Erlebnis.' 'Erlebnis' is simple awareness without being affected by the impressions made by a 'representatio'. It is hearing without listening, listening without accepting, accepting without assimilating. 'Erfahrung' leaves a stamp behind its tracks so that the recipient is no longer the same as he was before.

This 'physical energy' which electrifies the conjuration of images is the vibrated life of the scientific form which delivers when 'appropriately' registered. Such 'propriety' refers to the congruent immanent familiarity

as the received 'view'. Thus, the situation may not anymore respect the algorithms of a contrived syntactical skill of demarcations between what is literal and that which is metaphorical. A metaphor is no longer an external application which is meant to adorn or to decorate. As Paul Ricoeur (1978) suggests, a metaphor functions as an element of displacement in the process of substitution that aims at persuasion 'to rediscribe reality.'

In scientific territorials, this redescription and reformulation involves a restructuring of reality or at least its semblance, according to an idea and language which tolerates the inevitable delimitation that the passage from idea to word involves. The 'received view' is ultimately determined by the varied constraining factors that gravitates the recipient. Herein lies the hidden parameters that translate the actual to the possible, from the complex to the simplicity of the Tradition - to evolve, to metamorphose.

It is a redefinition brought about by the continuing restructuring of the representation of nature. This inner dynamism of a metaphor in science is grounded on the contingency and conditionality between what it aches to convey and what it actually manages to express.

The depth of this 'oughtness' serves as the fertility index of the scientific metaphor.

Nature then twists and turns into an macrocosmic metaphor to the mind. It is a concealment of the inner workings and configurations of which the natural products hardly speak about. And the scientist as a discoverer appears to be no different from this innate secrecy of processes which self-seals in an inwardness that self-fills into a pitless source of wonder in his own interiors. The metaphor of Nature seeks correspondence from the Metaphor that is Nature itself in a discourse that proceeds by displacement and substitution. The facts are symbolized to permit the possibility of relations, relations are mathematicized to create possible patterns, patterns are anatomized for probable correspondence with largerframeworks of matrices, so that preferential truth-claims are gained by its strength and power of persuasion. On this form of 'objectivity' lies the unique freshness of the metaphor of nature. It is always pregnant in its concealment that it encompasses while it reaffirms its distinct character.

The reference to the character of a metaphor as both encompassing and distinct need not pose unwarranted difficulties. Correspondence demands a center for which the possibility of asurrogate is transacted. A metaphor then is a proclamation of a new correspondence by virtue of a new center which is approximated by a reformed language form that appears to involve an ambivalence of agreement and disagreement, of positing and apositing two concepts of the same framework. Obviously, this operation presumes inextricable antecedents and archetypes of

nature, v.g., unity, order, equilibrium, balance, symmetry, coherence, etc., which are projected in versatile forms of 'luminousity' of an incarnated metaphysics at the root of a unified theory. It appears that this is Nature's natural way of speaking and communicating. No doubt, it is man's corresponding form of reception and expression.

In this metaphorical condition lies the interfacing of the scientific discoverer and the poet and the artist. Beneath the heightened scientific metaphor lies the roots of the discovered poetic and artistic metaphor. It is man's faculties at its most sublime function and operation. To engage in wonder is man's singularity. To enmesh in nature's profoundest mysteries is a scientist's signal of specific universality. It is Newton's gut exclamation of the nature of universal gravitation in the form of "The moon is an apple." The wonder of a possible metaphor precedes the explication by mathematics which details the precise modes of its fresh context. This appears like a fertile theory that is later determined according to its structure and configurations by experiment and mathematical dissection.

In the case of the particle theory versus the wave theory alternative in interpreting the mechanics of moving bodies, the mathematics involved created a stumbling block to the adoption of the fresh insights made available by the alternative. The two theories resulted in the same numerical configurations. To say the least, the situation was both curious and disconcerting. Here was matter with two different nuances installed over the same mathematics and the same set of experience. David Bohm and F. Peat (1987:30ff.) in their opus *Science, Order and Creativity*, call this phenomenon 'the metaphorical leap.' A wavicle is both a particle and a wave. Given the same entity under different conditions, two different behaviors are to be expected. Given more introspection and gestation on this scientific metaphor, the modern quantum theory would have been unearthed as early as the middle of the nineteenth century without additional experimental data.

What we have been discussing is the Hamilton-Jacobi equation. From the same equation were derived the implicit equations of both Einstein's relationship and de Broglie's relation which constitute the very foundation of the quantum theory. With some modifications, the Schroedinger equation is derivable too. Such depth took time to realize that the plain looking metaphor "a particle is a wave" was pregnant of more discoveries that was waiting for both the creative scientist and the creative moment to unleash the future that was hidden in the present.

These discoveries could only be made possible by substituting and changing 'centers.' The intense weight imposed by the Newtonian infrastructure made it extremely difficult to appreciate, or even to develop a wonder for what the wave represented. The bondage which the view of motion in terms of particles and trajectories had to be severed and replaced by that of a wave which certainly is still a body but of finer stuff.

Niels Bohr, in the same spirit of a scientific metaphor suggested that electrons in discrete orbits undergo change discontinuously. In a spirit altogether different from how Bohr spoke about his observation, his colleagues applied a literal interpretation. It took the triumvirate of de Broglie, Heisenberg and Schroedinger, to give a final blow to the hesitancy of giving up the classical notions altogether and assume a radical and a new twist and what turns out to be a more integral concept of the atom. As it turns out, a shorter route would have taken place via the wave metaphor of the Hamilton-Jacobi theory.

Now, it can be told too, that by treating the wave as a form, and by equating time and space, the wave forms undergo the 'canonical transformations' so called. The actual order of the motion remains unaffected while the wave forms undergo change.

Through the facility of scientific metaphors, scientific ideas such as force, gravitation, particles, electromagnetism, seemingly contrary entities are made to interact, cohere, and probably form an encompassing unified theory. The process of locating a functional proportion and correspondence involves the agency that goes beyond laboratory experience and expertise. The metaphorical leap this time involves a curious type of sensitive foresight to various divergencies and matching properties of different components that go into a construct. Clearly, this requires and involves a more focal perception which 'invisions' the unitary bonds of the theory. More emphatically, this suggests a radical displacement of mechanism as a mere tool and never as an end, a reaffirmation that a theory controls an experiment, the scientific spirit holds primacy over scientific method, and perception reigns over data. The last factor for example settled the score in favor of Schroedinger's wave functions over that of Heisenberg's intricate matrices despite the general 'mathematical' similarities of both approaches under certain assumptions.

IX. Science Forms its Community

Science as a rational enterprise is indeed a social and public responsibility. It is a communal resource for belief and action. Previous theories which affect to a very large measure the mental and social dispositions of scientists were illustrated to a certain extent by what we have addressed earlier. This tacit infrastructure of varying spectra of intentionalities resist completely objectified formulations. Barnes and Edge (1982:65ff.) note that "Recognition of the open-ended character of concept application (in science) is of major significance. Once it is admitted, it is necessary to discount any relationship of logical implication...betweeen, for example, laws, rules, theories, etc., on the one hand, and actions,beliefs, etc., on the other."

The mimetic art and the semiotic interpretative strategems do not connote a realism of direct imitation. Rather, this process occasions

certain cultural and phenomenological specificities. Heelan (1991:213ff.) describes this verbal or non-verbal interpretation as some function akin to an artistic performance. Inevitably, the assumption of an objective and neutral approach so called which are processed according to the rigors of rigid syllogisms appears to be a moot and academic affair.

Introspections and retrospections are theory-laden. They bear an inductive support which could be cognitive, affective and psychomotor. They are culture-based within a multihued larger framework of our experiences and 'delimited' by the necessity of what is to develop. This bifocal situation arrests our awareness to the cardinal importance of the 'scene', the 'settings', the intimate bonds which bind the speaker to what is spoken, and the evolving meaning that unfolds in the process-object.

The hybrid results from the interactive product between the 'mythos' (story) and 'logos' (rational argument), between the discourse and insight. Hence, it is fairly common that the fundamental historicity that takes place is one marked by an elenchus of both internal and external factors.

This is inevitable where two factors as seemingly distanced as reason and story complement each other as coprinciples like its 'what' and 'how' providing meaning and significance of an approximated integral reality.

In the Kantian spirit as noted quite aptly by Jaeger (1965), mythical thought without formative logos is blind, and logical theorizing without living mythical thought is empty.

In a community setting, more so in a scientific subculture, this mental infrastructure is concretized in versatile though almost unrecognizable nonlogical and nonmethodological forms. It is 'truth' coached in contextual human experience of a select community emphasized with a unique character intended for a wider audience. It then operates akin to the Heideggerian account of disclosure. The truth stands out by itself without needing the 'originary source' to vouch its validity. In this sense, a genuine scientific revolution has taken place because a radical significance has fortified. It is a unique form of understanding since it is a product inspired by an active status of participative reorientations and reconstructions.

This makes scientific jargon and its human historicity a class by itself. A scientific meaning is a product of a flux of both told and untold transformations. It is a continuing epistemic process of both deliberate and unconscious inputs. It is a communing activity in context. It was for this very important diction that we used the word *hybrid* in introducing this paper. It is our observation that the theory of meaning in scientific mental representations is fundamentally an accretion of varied eclectic factors. It is a hybrid of natural and artefactual components which

Stuart Silver (1991:49ff.) discussed in his article *"On Naturalizing the Semantics of Mental Representation."* He realizes the imminent frustration for researchers on this matter that will only accept a kind of positivism of the explicitly verifiable "well-lighted areas." The subject's intentional participation is highlighted through this anthropological factor's thumbmarks which is neither easily traceable nor is it feasibly deniable. Such view assumes the position that this enterprise ultimately resumes cross-cultural and anthropological groundings when the language of science starts to wean itself away from the contrived controls and artificial mimesis of an experiment.

We have mentioned the inevitable earlier. A culture within a culture is inevitable. A subculture within a larger framework obviously differentiates itself into its own specific gravities which is characterized by its own sanctums and privacies of life and style. This is the phenomenon known as the technosphere. It is catalyzed by an intense formation of a special ethos that orchestrates criteria of competences, policies, goals, institutions, authority and legitimations. But a contending wave known as the homosphere creates a 'crisis of self-awareness' of science which leads to an 'awakening' of accountabilities and consequences of the scientist's decisions and choices. It is a Socratic posturing for humanism without the radical uprooting of science and its pursuits. It is Science and Man, and hopefully, Man and Science. Artistic sensitivity in science is reclaimed and rendered its due. Both doing and thinking science can never survive without this element of artistry. This is the return of science to man.

Must the scientific hieroglyphic 'for its own sake' need be at odds with the science for all or for the many? Does a scientific truth by its very existence share the simultaneity of credibility and legitimation?

Fortunately for man's natural propensity for metaphorical usage, the scientist finds a convenient tool for bridging dissonance in meaning and focuses instead on its resonance qualities. We have seen this in the debates between the discrete and continuous nature of matter and light, between the particulate nature of matter and its existence in a continuous field, between the magnetic and the electrical interpretation of the electromagnetic phenomena, etc.

The challenge occasioned by the continuing and the dynamic use of language in science sees no end. Oftentimes, this situation is viewed as a case of an ordinary language acquiring an entirely different baggage of meanings that suits the qualified needs of its differentiated users. The situation becomes more complex when we realize that these meanings acquire currency in largely unconscious and tacit modes. While this phenomenon may not entirely be alien to the general mode of evolution of ordinary language, we are faced with a dilemma in science where the activity can be frenetic, specialized, and indeed more involved.

Take the classic case of the Bohr-Einstein dialogue over what could be viewed as the discontinuities arising from the use of formal and informal language in physics. While Bohr made use of informal terms with introduced scientific notions, Einstein insisted on the adoption of scientific terms which correspond with reality. The former use led to ambiguous situations while the latter use professed scientific correspondence with reality. It appears that the conflicting application of language with its reality devolved on issues more fundamental than the current problem. This involved the antecedent assumptions on the nature of theory, truth and reality of what should be a common ground between the two protagonists. We see here how conflicts in the more basic assumptions do lead to further sublevel differentiations.

Substitutionality in this context assumes a broader vista of method transference wherein scientific method is applied to other areas of specialization and science is no longer viewed as a closed system autonomous and self-contained in itself. Otherwise, the previous mode of 'thinking and doing' science would lead to a petrification of its resources into a level of classical mechanics or the periodic system of elements. But scientific method should not be viewed simply as a hypothetico-deductive tool. It is rather an art and discipline which breaks the contraptions contrived in an experiment into an extrapolation of the intellect.

The traditional concept of science gives way to a diversely intersecting mode which is no longer viewed as neutral and sterile fibers of autonomous structures. This affirms and reinforces the inevitable appropriateness of a functional interdependence of a variety of resonant interactions of societal factors. The change of metaphors is therefore a historicity of conceptual change in science within a greater framework of the theory of cognition.

Scientific truth as a metaphor operates on the demand of wholeness that a reduction to its literal parts immediately changes the thematic validity and certitude. This is to say that the metaphorical truth becomes a literal falsity, as a literal truth is a metaphorical falsehood. This is to say too, that the inherent dynamism contained in a scientific metaphor which features a shared world of people and events in an electrified whole is mortally threatened by a literal reduction to conventional staticity.

But how does the scientific metaphor gain acceptance? Briefly, how does the metaphor attain scientificity and legitimation? This is a question of expertise out of which all the other issues follow. Barnes and Edge (1982:233ff.) described the 'expert' as the representative of a trusted institution and/or the bearer of trusted knowledge and competence. Take note that the modifier 'trust' appears distinctively twice and must therefore bear the anchor of whole constitutional determination of whatever the 'expert' deserves or assumes to be. But such expertise is obviously

invested by a very specific community which thrives on icons of extraordinary forms of rationality. Scientific theories for example which constitute a classic case of science's verbal culture is doubtless a human invention most specially in the area which previews intangibles and deduced relations. In this sense, does a construct raise other issues even as it resolves. But the specific features of such a construct are canonized by the collective assent of the specific community which gestates an ongoing tradition.

No doubt, language use in science will have to be 'stretched' so to say, beyond the limits of primitive literalness. This is inevitable when science proceeds from the known to the unknown, from the observable to the unobservable, from the body to the theoretical entity. This is an objective admission of our subjective limitation that some forms of reality are beyond our ken. This means that while we cannot really posit the actual existence of an entity, we can translate such uncertainty to the 'calculated' risk of positing the possibility of the actuality of such entity. The scientific metaphor of viewing gas molecules as elastic balls, or atoms as miniature solar systems, or that some subatomic particles as being 'absorbed' by other particles, is a metaphorical remedy of a literal limitation. In the absence of a direct access to the entities or processes in question, an indirect, or even a circular mode of truth-approximation is implemented. The scientific metaphor is a species of its kind in the sense that its public and societal answerability in terms of praxis as evidenced by technological demands may appear more proximate than it is evidenced perhaps in other forms of metaphors.

In one way or another, we have seen how scientific ideas of an institutional magnitude intrude into cultural currency and assume broad contextual forms. How the intellectual forms of the empirical, the exact, and the technical nuances percolate and blend with the concrete social factors of political, economic, moral issues evolving a different form of scientific knowledge is a problem which is not easy to formulate. Contextual interactions are charged situations which seemingly are best dissected on the specificities of a mutually symmetrical approach. Here is another form of displacement which involves the necessity of postulating the impact of tacit meanings which constitute the inner core of an evolving usage, formulation and transmission. To describe the 'How this is done' function is perhaps more difficult than going through the rigors of experiencing the actual operation of the function. But this does not mean to say that going through the formative exercises to imbibe the knowledge or skill is an easy task. The personal character that such knowledge or skill assumes in the learner is another non-algorithmic issue. This involves the active transformation of the received meaning and significance into its contextual discourse of time and place. Obviously, this is a process which transcends mere information transfer. Tacit understandings involve entirely distinct considerations so that

a word, or a symbol, or even a piece of scientific apparatus may represent sufficient cause of legitimation. The historicity of the concept of ether is a classic example of this case.

If conventions mean what collective actions amount to, conventions serve as poor postulates to unfold the determinants of the interaction between laws and theories on one hand, and beliefs and norms on the other. Rather, conventions appear as a product more than a process. Formal systems of thought are therefore deemed as 'ex post facto' constructs and consensuals as a result of the adaptive processes between the deductive inferences and the informal inductive materials. The former systematizes the latter. The latter is legitemized by the former.

Apropos, it is obvious that the scientist is a storyteller in his own way. He tells the kind of stories he is best in telling: the journey of science in a specific community and the interactive growth and assimilation of this community in society. This makes his stories compellingly dynamic. He tells stories of insensuous thought by means of sensuous terms arranged according to the artistry learned from unique encounters with Nature. They are stories about how nature is enfleshed and clothed according to his humanity and context. It is the transfiguration of nature into its human form contextualized by the scientific community. As Peter Medawar footnotes, "a 'story' is more than a hypothesis: it is a theory, a hypothesis together with what follows from it and goes with it, and it has the clear connotation of completeness within its own limits." The production of such modes of language forms goes through the contingencies of the intricacies of the 'nomos' and 'ethos' of a communal assent of the scientific community and society at large which in turn serves as layers of a resonating body.

This is a determination which is occasioned by a presumed 'tradition' prevailing in the atmosphere of the mind so to say, and the act of sensitive reading done within a specific culture. It is a knowledge .pl62formation brought about by interactive forces both conscious and unconscious, making the alleged demarcations between objectivity and subjectivity fuzzier as before.

This makes scientific discourse and rhetorics peculiar in genesis and currency. It devolves on what Harre' (1991:82ff.) emphasizes as a question of trust symbolizing the intersubjective discipline that is borne on integrity and track record in research programs. But perhaps, more than an inventory of a series of 'confirmations', trust in this context refers to the role played in such an elitist community. When we mentioned the quality of 'expertise' in science, this conviction obviously encapsulated the forces of 'communal certification and personal demonstration of mastery' and installed as a canonical product.

The scientist as the actor of the story breeds his role on his character of credibility. He mediates between two concentric circles of discourse

the internal debate between the forces of nature so called, and his discourse regarding his insights with his audience. Harre' however does not equate reliability with truth. It is reliability which banks on character for its substance. Thus, while the 'bookkeeping' activity of the scientist such as reporting, recording, etc.,appears impersonal as a narrative convention, the 'indexical' quality of the scientists' work unmasks itself inviting active participation, judgement and acquiescence. In Poincare's (1913:387-394) opus *The Foundations of Science* for example, these two phases coexist.

This is however a limited picture of how knowledge in science grows. The greater reality involves scientific knowledge as both a social contract and construct which function in its most 'natural' mode in the form of an interrogative description or a descriptive interrogation. The fundamental open-endedness of the interrogative character of nature intimates a story with no conclusion to end with. It is a play with concatenated climaxes. Usage of terminologies of science begins to loosen and its terms' stiffness softens as they are transported into literary works of a particular context for example. Centric displacements of meaning contracts and paradoxical approximations are dislocated and rearranged, to suit the translations of the instinctive use of specific instances. This is known as asymmetry in the use of data.

This displacements of previous anchors should therefore remove any expectation of a thorough-going and sustained congruity. A transformation and not a simple transfer, is a fertile oasis of fugitive insights and worldview reception. This is all but a one-to-one systematization. Necessarily, such a stance requires more than the average knowledge and attention since the materials involve both the associated and the unsettled. This is the fate of privileged stories which involves and highlights the personal assessments of the scientist over methodological sophistication.

This being given, we cannot posit a linear relationship between the canonical product of science, the problematic, the community and the scientist himself. This overly simplistic representation of the communing relationship between these elements is nothing short of a fiction. Science is neither a product of human construction nor is it a faithful replicate of objective nature in exclusive demarcation. Science is an attempt at both of these. But science remains stunted without the epistemics of aesthetics which configure the form and reality into something which is both distinct and encompassing, from the universal of probables to the potential universality. This is to conceive science in its most sublime form, that of being an eternal relative. It is in this aesthetics that science becomes both, a social act and a social potentiality. It thus becomes an index of social differentiation and assimilation as nature is transposed to societal and historical dimensions. In this sense, the scientific language as an overarching complex form of verbal and nonverbal activities

constitutes a social metaphor which is a hybrid of reason and deeds. Contrasts give way to correspondences and displacements lead to transformations. This overall result is effected by what we now know as the aesthetic mediation.

Indeed, there is so much reason to the mimetic description of the subject's active state in the movement towards its 'telos' without end. Such activity involves some form of a compatible coherence which is an inexhaustible task owing to its 'oughtness' dimension. On this 'oughtness' intent lies the metaphysical resistance of a metaphor to be reduced to its sterile literalness where science does not exist at all. On this 'oughtness' intent lies the fundamental restlessness of science to rest on mere conventions and again, the literal.

Indeed too, this phenomenon breaks the univocality of matter as such through the processes of the scientific discourse into its more versatile form, v.g., the analogous frontiers. Taken as a circumscribed datum and statement, matter does not assume as yet the status of science. While such statement 'demands' belief, it does not as such provoke and instigate meaning. Meaningfulness occurs when the scientific statement and the story are contrasted against an implied prior and a prognostic demand. This is the substitutional strategy for wholeness.

With this development, the automony so called of scientific language and the alleged objectivity posed by scientific method experiences the 'hard questions' so to say. The broad model of interchange assumes a role which we find in the use of metaphors. In this shared tongue and context, the subculture of science participates and evolves. It participates in the general use and cultural contamination, but it maintains a degree and an intensity of understanding which is available only to a community which has delved on a unique determination of an 'implied prior' which we call the story of the scientific enterprise. This process of cultural association and recognition reconstructs the natural system of sign-vehicle and meaning.

In what appears to be a scientistic consciousness (Habermas, 1989), demarcations and conventional correspondences in method-subject matter operations are transgressed and transpositions experimented. With propensity and ingenuity to formulate unifying and unified theories, differences between sciences with avowed unrelatedness such as economics, psychology, sociology, etc., are deemed as related developmentally. Such experimental shiftings and displacements in both method or materials have been proven successful in no modest measure. There is no doubt that hypotheses regarding the interface between the strict empirical sciences and historico-hermeneutical sciences will be more than an exciting exploration if not encouraging from hereon. Such extensive reaches is possible for example with the language of symbolic forms of Cassirer which encompasses science, religion, myth and the arts, and

ultimately, the overall cultural phenomena. Since all reality is projected by mimetic and representational processes, all live by and through such representations. These representations are 'personally' aggrandized in a "particular ideational content." In this image-worlds which are transcendentalized in symbolic forms, man perceives himself and reality. Within culture is science born, within culture is science formed.

Science, art and myth would then orbit in the same set of categories of a transcendent cultural metatheory. Culture is tasked to dwell on the empirical analysis of the formal relationships of the symbolic forms. Science deduces statements within these symbolic forms as referents. Such referents operate with regard to phenomena as some form of a transcendental precondition which addresses the overall organizational matrix rather than the causal connection of events.

When the smoke of the stories settles, the embers of the reason of science will continue to flicker, radiating the warmth of hope that the untold stories just might be relayed. In all likelihood, such instantiation of the 'dramatis vitae' in the form of a story will project more than what the storyteller intends to say. Science is not a mere linguistic construction. It is a story of life orientation. ❑

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