

# Matter is Consciousness

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Page | 1

*A human being is a part of this whole, called by us 'Universe', a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest — a kind of optical delusion of consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to apporportion for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty. — Albert Einstein*

Traditional Western thought has consistently modelled those world-views which have generated ontological gaps that runs across the whole domain of existence. For example, human and other organisms, in spite of the fact that they share the same cosmic niche, are considered to be literally worlds apart. This dualism is one of the fundamental, often, tacit tenets of Western metaphysics, epistemology and ethics. Dualist conceptions of human beings themselves are rooted in this deep-seated anthropocentrism. This dominant world-view has assimilated evolutionary theory and historicised this ontological gap.

All — religious or secular — teleological perspectives construe the variety of life-forms as the result of a process leading to the advent of humankind. *Homo sapiens* is not seen as a stage in an indefinite flux of change, but as an end, the glorious result of a history of trial and error. Is there any difference between this view and that of creationism? This dichotomy between human and non-humans was extended often to other races, often treated as slaves and even women were not exactly placed in the same category as evolved humans — this was especially the case with many nineteenth century Darwinians. Social differences within Europe itself were classified in this line of thought. (Bouissac:1991).

In the context of a discussion on Matter, it is important to note the specific historical-philosophical climate of Europe during the sixteenth-seventeenth centuries, within which the Scientific Revolution took place. It is also worth our while to recall some basic presuppositions, essentially Western, which dominate our times, summarised as follows:

## **The Universe**

1. A mechanical machine, with no intention or purpose; not an organism having consciousness. In being so, it is indifferent to man — hence it needs to be conquered.
2. It is real to the extent it can be externalised, quantified, measured in terms of mass, dimensions of size, colour, taste, etc., characteristics that are ultimately not real.
3. The internal nature of man is subjective and different to the external which alone can be objective and true.
4. Matter precedes intelligence; the latter must be explained in terms of the former which may be dead, though subject to purposeless forces.
5. Time is linear, sequential; and space essentially uniform. Energy is basically the same, not gross or subtle — though it may be more or less in quantity. Time, space and energy are only externally real, and are independent at the level of perceiving consciousness.
6. Importance is given to the causal notion in terms of the evolution of complexity and intelligence.

## **Man**

1. Man is essentially a rational cognizer, a body with a mind localised in it or an "engine with a will" (Descartes and Behaviourism); he is an atomic being, an individual without any transpersonal spirit.
2. There is no essential hierarchy of being or consciousness among men or within man; even if so, it is irrelevant to knowledge and the organisation of society, governments, etc.
3. As he is, Man is an imperfect being, yet the measure of all things.

## **Knowledge-Truth**

1. Knowledge is an end in itself, except for the betterment of the estate of man.
2. There is one truth, if it was Christianity once, it is Science now.
3. Subject and Object can be completely separated, i.e., without a need for earlier studying oneself.
4. Reason is the only faculty by which knowledge may be obtained, even experiments are extensions of this faculty. But sensations and feelings are not true perceptions.
5. True knowledge is obtained by proceeding from the parts to the whole.
6. The importance of detaching oneself from the subject of study, rather

- than by participation and experiencing the object.
7. Reality is a mental construct; knowledge is abstract and general, not a vision or experience of particulars.
  8. True knowledge is quantitative, not qualitative — what can be quantified is independent of place and function.
  9. True knowledge leads to predictions of what is known, since it is based on external, repeatable perceptions; only that which is externalised is available to true knowledge.
  10. The truth and falsity of propositions is self-evident, irrespective of the person who says it.
  11. As knowledge has nothing to do with being-ness or consciousness, it is not esoteric, i.e., it requires no moral preparation to be discovered or to be understood.
  12. In principle, in the making of actual observations (not in the interpretation of data), the observer can always be replaced by scientific instruments.
  13. The dichotomy of faith-knowledge, is perhaps more a consequence of the Scientific Revolution rather than a presupposition that truth and knowledge reside in dimensions different from those in which religious considerations about God, etc. reside.

The point of the above summary is to indicate how these concepts, world-views and classifications have effected the understanding of the elements, of matter. But these issues do not merely rest at the theoretical level. They have had, and continue to have, pragmatic consequences. For example, the idea of slaves, racial inequalities, ethnic conflicts which one sees all around — even the exploitation of depressed classes — emerge from this higher and lower idea in the rung of the evolutionary ladder; the experiments on animals, and humans, that are treated as objects because they are known to be driven by blind instinct and hence are dispensable. The exploitation of the environment also follows from this world-view, since the non-human world is devoid of an autonomous agency and exhibits only passive resistance. This is due to the use of such metaphorical categories as mind, matter, conscious and unconscious life, blind instinct and clear-minded intentionality, automatism and free will, and objects and subjects. In such a conceptual framework animals are defined negatively as devoid of mind, plants as devoid of mobility, etc. Thus, philosophies and world-views, not always as abstract models, are powerful reinforcers with definite pragmatic consequences through their authoritative legitimisation.

In contemporary terms these systems may seem aberrant. Nevertheless, many of the biases continue covertly. For example, what is considered universal today usually implies a dominant Western world-view — whatever way one may

define it — and all other categories have to be subsumed within it in the name of universalism. In this one may include the idea of linear time and progress towards a certain state. But this makes these approaches less flexible, against those cultures which see evolutionary developments in terms of cyclical time wherein catastrophes are part of nature and reality and, further, encompassed within a larger context.

Of course, the notion of the earth as a complex system within which organisms interact with each other and with geophysical and chemical processes in a predictable manner is at the root of modern science. It permeates Western and Westernised cultures and prevails across the spectrum, beginning with elementary textbooks. But the interrelatedness is still in terms of a mechanical interpretation, as one to one cause-effect relationship. For instance, earthquakes have geophysical causes since we know that the earth is made of inert matter explainable locally and regionally rather than in any global systemic terms. No notion of an independent variable — say, a god in heaven — would suffice for an explanation of the earthquake (*Ibid.*).

The belief of inert components of the earth has also led to the passive exploitation of the resources. The belief of the Navaho, who treat the earth as mother and have sacred places, would consider coal mining as digging into mother's body — a heinous crime; or other groups of the non-Western world who apologise to the tree before cutting it. Both are equally compelling truths within the boundaries of their world-views. The holistic view perhaps helps in a sustainable development for a long time, while the exploitation of maximum resources for development and progress is a short time approach even in historical — evolutionary terms. No longer can one describe the earth and life merely in terms of the laws of physics and chemistry; that life just happened on earth by chance. Shifting world-views within the Western tradition is reflected by not only the developments in physics, chemistry and biology but also in the Gaia hypothesis (Lovelock:1979,1988); this particular world-view that is both holistic and multi-centered developed within the scientific tradition of the West — in the framework of evolutionary biology. It is congruent with many Eastern world-views and, if such convergences are possible, it is also imperative if humankind is to survive, provided that the idea of interrelatedness within the framework of Consciousness is taken seriously.

Based on the above assumptions, the prevailing world-view in terms of humanistic psychology, of modern man contrasts with the traditional world-views, all over the world, i.e., nature unfriendly and confrontational, so the need for control and, therefore, the feeling of alienation and separation. Hence, the necessity to provide orderliness, protection and predictability for its members through structure, property rights, laws, enforcement agencies and a central hierarchy of authority and so on.

The transformational world-view which the new science and ancient insight suggest, is that of a friendly universe, to be accepted, experienced and celebrated; space and time are relative-ininitely small or large units. Nature is an evolving eco-system of which you and me, the human species, are a part. Therefore by enhancing nature we enhance ourselves. Life is a matter of contributing through myself and others to the universe. The purpose of human society is to increase the service of its members to other human beings and to themselves. To do this, I must realise my fullest potential of body, mind, and spirit. To do this requires an environment that supports and encourages self-actualization and self-responsibility. I am unique, but I am also one with the human species.

Many a Western poet and mystic have felt at odds with the cultural implications of modern science and technology. Recent advances in science are ahead of these early assumptions, especially in physics. But in general there has been no serious challenge to these assumptions from many quarters and have a hegemony which remains unchallenged by and large. It has widely spread like a surgical transplant, such as in India, subverting all that is there in the indigenous and inherent to Indian traditions in a deep sense. No doubt one should be conversant with all that the West has to offer. But the quality of Being-Consciousness — a fundamental basis of Indian thought — needs to be taken into account in any discussion of Matter. But let us turn to contemporary developments in science for our purpose.

## **Physical Whole**

The Universe is everything that is and ever has or will be; there can be only one. To speak of many universes is therefore misuse of the term. If there could be many, they must somehow, in some sense, be mutually related; otherwise they could not be distinguished, or counted, or regarded as a many. They must constitute a single complex, within which there may be many distinguishable regions or epochs, but these would not be strictly be Universes, even if between them no communication of information could pass. If they exist they must have some kind of togetherness. So long as they can be at all conceived and postulated, they will all form part of the all-inclusive Universe.

But serious objections can be brought against the notion of an infinite universe, however subdivided. Infinity is a concept that has given cosmologists trouble ever since Newton, and physicists today do all they can to eliminate from their calculations. Contemporary quantum physicists have invented a method of removing it that they call 'renormalisation', and Einstein adopted a similar stratagem. Special Relativity establishes an equivalence between matter and energy, and general relativity identifies fields of force with space curvature.

Accordingly, matter introduces curvature into space and bends it round an hypersphere, so Einstein introduced the cosmic constant into his gravitational equation, which eliminates infinity from the resulting model of the universe.

The full spatio-temporal extent of the world is now described as finite but unbounded — like the surface of a Euclidean sphere but having three instead of two surfaces.

In thermodynamics, the random activity presumed is that of molecules dashing hither and thither in a volume of gas or liquid. But molecules are highly structured entities, as are also the atoms of which they are composed. Any random movement must presuppose the existence of some such entities (involving their own order) that can be shuffled around. Prior to such order, there is no discoverable chaos. Present-day particle physics discovers no hard, impenetrable granules. The elementary units are quantum entities that as much waves as particles, and have been called 'wavicles'. They are conceived as wave-packets, superposed waves, at once both energy and matter. Again waves have structure and are periodic, and prior to them there is nothing except time, the metrical field, which itself is an ordered manifold. If it were not ordered it could have no geometry. Where then are we to find the primary bodies that move randomly? But indeterminacy exists only at the particle level, or wave-packets, not at the macroscopic level in which they are embedded. One has therefore to conclude that random activity is always parasitic on some sort of order and cannot have ultimate priority. It is precisely in the primordial form of order that the conditions for the development of life and mind implicitly reside.

The idea of the unity and wholeness of the physical universe has received enthusiastic support from particle physicists in the last decade of this century. At the turn of the century, Planck's discovery of the quantum of action and Einstein's formulation first of Special and then of General Relativity immediately had revolutionary effects. Space and time ceased to be viewed as separable parameters, but were fused together as a single metrical field, and its organising structure provided principles of order governing all physical laws and events — particle and wave became complementary concepts. The energy system, taken as a whole, thus assumed priority over determination of the exact position, or the precise momentum, of particles within it, so that these properties along with others became conjugate. Pauli's principle of exclusion, and Heisenberg's indeterminacy laid the foundations as is well-known, as the latter said, "The world thus appears as a complicated tissue of events, in which connections of different kinds alternate or overlap or combine and thereby determine the texture of the whole".

Without going into the history of theoretical developments, more recently, David Bohm has maintained, by way of discovering a credible interpretation of the quantum theory, that the physical substance of the world is a dynamic

totality, which he calls ‘the holomovement’, in which a principle of order is implicated and expresses itself variously in the emergence of phenomena and entities (such as elementary particles), so that, on the analogy of the holograph, the whole is implicit in every part. This is an ontological interpretation of the quantum theory, consistent with experimental findings and conforms to Bell’s theorem, satisfies Schroedinger’s equation. In short, the theory is then able to account for the experimental facts, but requires us to regard what is measured and the measuring instrument as a single indivisible complex, within which what is measured comes to be. The theory has not been adopted by many physicists, but it illustrates afresh the contemporary trend to interpret physical facts holistically in terms of the field.

If dogmatic idealism fails to recognize the dialectical character of the whole immanent in finite experience, it commits the epistemologist to a subjectivism that is as disastrous as dogmatic realism. The first because it leads inevitably to self-contradiction in solipsism; the second because, by confining consciousness to an effect in the brain of an assumed (but ex-hypothesi unknowable) external cause, it excludes from knowledge the very object that the knowledge seeks and claims to embrace. The one feasible resolution of the contradictions involved is in the self-specification of the universal whole as a dialectical scale of forms, manifest in the physical universe and bringing itself to fruition through the organic world in the self-consciousness of intelligent life.

What, then, is to be taken as the criterion of truth? By what standard do we assess the validity of our knowledge of the world? It is the degree of coherent wholeness of the experience judged, both observation and theory together. When they do not agree, contradiction arises, due to some oversight or omission in one or the other, and corrections are needed, or presuppositions must be changed, in order to restore coherence and systematic wholeness.

### **Artificial Intelligence and Consciousness**

To speak of mentality in terms of sentience and consciousness is now-a-days anathema to many. A long history of materialism, mechanism, and behaviourism — largely a hangover from the Renaissance world-view — has resulted, more recently, in an enthusiasm for artificial intelligence and the opinion that the human brain is some kind of highly complex digital computer or general Turing Machine, to the functioning of which consciousness, if it exists at all, is irrelevant.

To deny the existence of consciousness is self-refuting. It is that of whose existence we are directly assured by its very occurrence, and without which we

could be assured of nothing. No theory of artificial intelligence, no opinion about the epiphenomenal character of awareness, could be entertained without it. Moreover, the behaviourist, demanding cognizance only of what can be "publicly observed", disregards the fact that such observation, so far as it is perception — as it must be, is the private experience of the observers, and that they can communicate it only on the assumption that others can become aware of their means of communication. All this, again, presumes the use of the senses and, therefore, the existence and presence of sentient experience. We ourselves are consciousness.

A general Turing Machine, the theoretical archetype of all computers, does no more than operate a mathematical algorithm; that is, a procedure in accordance with set rules — howsoever complex and sophisticated. But no algorithm can be devised except by a human mind — no Turing, no machine. So if we try to pretend that the human brain is no more than a complicated computer, we beg the question. Godel's Theorem proves that in any formal system whatsoever, a legitimate proposition can always be formulated that is unprovable in the system, and so it establishes that there is some mathematical thinking that is not formalizable and therefore cannot be computable. This statement seems to be true, because seeing it as true requires insight, which is not the product of this or any algorithm albeit the brain unconsciously in its operation acts like one for some functions.

That insight involves consciousness must be accepted if we recognize consciousness as the activity of organizing sentient presentation. In the first place, such organization is the establishment and comprehension of relationships within a whole, and the perception of relations precisely is what constitutes insight. In the second place, the relations are established between elements in the sentient field, and nascence is what characterizes all consciousness. Thinking, including mathematics, continues this activity at a high level of abstraction, but is never wholly devoid of sentient content.

But how, we may be asked, have we established the existence of sentience itself? To this the answer is: By the self-certainty of consciousness, the presence of which is undeniable without self-refutation — for one must be conscious to deny it, and could postulate it without having it. And consciousness is nothing other than the awareness of elements in the sentient field. Methods of investigation that ignore the occurrence of sentience and consciousness, or which refuse to make reference to it, may in some circumstances, and for acceptable reasons, be justified, but the pretense that sentience and consciousness do not exist can only be an affectation on the part of those who seek to deny what, by its very nature, is ineluctably manifest to themselves and to all other cognizant beings.



## Observation and Perception

Normally sentience has been compared to a camera, in which the entire surround is reflected through a single lens on to a screen within a limited space. But this analogy is limited as it tells of a clear articulated scene, where sentience is an indiscriminate mass of diverse feelings. But this has further disastrous epistemological results, as it eliminates the viewer from the scene, who sees, recognises, and interprets the reflected objects. We are lured into believing that perceiving is the result of the transmission of physical effects from the outside world, through our sense-organs, to create some kind of replica or model in the brain. Even neurophysiologically this is an unsupportable theory, since it is the mind set, or subset which is crucially involved in the act of perceiving the external world — that is why the world differs individually. May be in order to know the true nature of perception, one ought to say what it is not, first, and why.

As stated above, perception is not the end result of a causal chain of physical and physiological processes that converted into a psychical cognition. First, the causal relation between the object and the percept is excluded from this end result. The percipient is certainly never aware of any such causation. Second, it is usually assumed that the sensation caused from without is an indubitable datum. But perception cannot be such immediate acceptance of data, assumed to be indubitable, or hard. All that is undubitable about any experience is that it occurs when it does. The immediate sensum, moreover, is not and cannot be apprehended as such, unless it is distinguished from a background and identified as an object, an accomplishment requiring inchoate comparative judgment — some degree of discursive activity. Third, it is said that causal theory requires as its compliment the 'idea' — it should a copy or representation of the external thing taken to be its object. It means some archetype, to which we have no independent access, in order to make the necessary comparison. But we did know it then we would have no need to apprise us of it.

The sense-datum theories, the building blocks from percepts are constructed are erroneous, as unrevisable bases of all knowledge. Yet when we perceive objects, we seem to apprehend them as a whole, beyond mere sense-datum. Perhaps, language interferes here, since 'seeing' implies what is seen as an external object either perceived veridically, or 'seen as' what we take it to be. May be one can distinguish the two by using the word seeing for the former, and looking for the latter, to remove ambiguity. We need some valid criterion to judge between cases in which we actually see — veridically — and those in which we only think we see. But again this become a problem of the language and the theory of appearing. We need not go into the whole range of such philosophical discussions available in literature. The point is that whatever we perceive, the object of which we become aware is not what we directly sense.

Neurophysiologists and psychologist have demonstrated this for even simple perceptions, which are the products of quite complicated incipient thinking.

Sense-datum theories are the progeny of empiricism, which declares all knowledge to be derivative from sense and is then committed to discovering the sensuous data on which it is based. But it ignores the fact that all knowledge is organised experience, which is essential to cognition, without which there can be no perception. This is an analytic-synthetic activity, involving thought, attention, senses and a Gestalt, in accordance with the principles of organization essential to its nature. Perception is thus the activity of structuring the contents of primitive sentience — from the physical and biological levels as traced elsewhere — and at every stage, from the most elementary to the most complex, it is always the comprehension of a whole.

Cognition begins with perception, when the object — singled out from a whole background — by attention; and, by successive stages, objects are identified and distinguished and relations are established between them. The existence of the organism in the world, in its interaction in the world, is registered in sentience. Apprehending mutual relationships, identifying them, and distinguishing them is the thinking activity of the conscious subject thus awakened; each individual act being one of judging, initially implicit but, in the more developed phases, explicit and articulate. Perceiving and thinking can therefore not be separated. Or, concepts without intuition is hollow while intuition without concepts is blind. Massive experimental evidence shows that the perceived object is formed and conditioned by context, spatial and temporal, and by past experience. Thus no physical thing is presented ever as a whole to the senses, yet it is perceived, when at all, as a whole. But the cognitive result, the implicit judgment, implicit inference and interpretation — subject to the principle of ordering — arises in relation to the funded knowledge of the experienced world. The realisation comparatively recently by scientists and philosophers of science that all observation is theory-laden is therefore hardly surprising.

The experienced life-world, its experience and awareness and perception is a unified one in the ordinary sense also, its natural for it to be so; an integral whole, even if its intrinsic coherence varies in degree according to the extent to which the experience has developed and is systemised by the thinking activity of the subject. The unity is organic as consciousness; the experience of structured whole, of subject and object, could only be cognised as related to other presented objects if both or all were held together by the cognizant subject within its own consciousness. It is not as if it is brought from the outside; for the subject is nothing less than the universal principle of wholeness that has been immanent throughout the process of nature, and is intrinsic to the organic unity now come to consciousness through the sentience of the organism, operating throughout nature also. It is the same organising

principle that integrates the physical cosmos and unites the biosphere, which unifies conscious experience and ensures the integrity of the experienced world.

In practical terms the belief in the reality of the life-world is immediate and innate, its initial justification is primarily pragmatic. But as stated above, it is the coherence of the experience as a whole that is implicit even in pragmatism. The process of bringing the world to consciousness is, in the first place, the imposition of order and systematic relationships upon the sensory flux. In the life-world — physical and biotic — all are mutually continuous dialectical phases or specific forms in the necessary differentiation of the universal duality. Since the world is a whole it must, of necessity, be complete, both synchronically and diachronically. And as no whole can be complete unless brought to consciousness, the universal principle of structure comes to self-awareness in the consciousness of a cognizant subject, through the natural process that issues in human experience of a perceived world.

In the course of becoming organised, self is distinguished from not-self, and the spontaneous activity of thinking becomes aware of its own agency as subject concomitantly with its apprehension of its object, and that object is nothing other than its own self in process of generation. Throughout mental life, the object of awareness is always the prior phase of the dialectical process. This generates the perceptual world of spatio-temporal bodies and their properties; but, as accepted in the natural attitude or common sense, the life world is still far from being fully coherent; so that perceptual consciousness itself becomes an object to a further stage of conscious reflection. Admittedly, we cannot get outside our own consciousness, but consciousness is itself the activity of ordering the contents of sentience; and that is, as we have asserted, a unified whole of feeling which, in the very course of the process of organisation, is revealed as the focused registration of a world external to the sentient body.

The difference between common perception and scientific observation is not one of kind but only of degree of sophistication. Both are active efforts to discern presented objects by a subject framing hypotheses and trying to confirm them by correlating evidence for and against; in the first case the process is largely subconscious, or prejudicial, and in the second it is deliberate and explicit. But it is the paradigm that dictates in scientific advancement, and attention is selective — what guides it is interest, on the one hand, and previous knowledge, on the other. What is perceived is partly what is expected and partly what is sought; it is simply never what is there. A vast amount of material is therefore overlooked, and often in this lack of perception it is not credited as possible. In this sense scientific observation is continuous with common sense, in that it raises observation to a high degree of

systematisation what is already the experience of an ordered world. One may

thus say that it is the same totality throughout, in different phases of self-articulation.

## **Mentality and Sentience**

An organism, as organized being, involves a concept because it is a whole constituted by parts that are mutually adapted and are equally adjusted to the overall structure of the whole. Hence, in order to exist at all, such organism must be organized, and it can arise only out of what is already organized being. The very functioning of the parts and processes of the organism involves a concept — a principle of order and relationship. But a concept implies the existence and activity of a cognising mind, while the material existence and operation of the organic being is in space and time, dependent on physical laws and external causes that are antithetical to the purely ideal. This contradiction can be resolved only if, on the one hand, the concept immanent in the material system qua organized is somehow objectified or actualized in its practical functioning, and, on the other hand, the organizing principle in the organic system is brought to self-consciousness.

Sentience is not only the feeling of the integrated physiological whole of the body but is also the feeling of all these focused into a single complex whole. Hegel identified sentience with the soul, and Aristotle maintained that the soul was the form of the body. The soul is not a separate ‘thing’, attached to, or associated with, the body, acting upon it from the outside, or acted upon by it to generate sensation. It is the form of the body, the new quality evinced at a specific, critical threshold of intensity of integrated physiological activity. Feeling, the self-revelation of this new form, is not just something triggered in particulate flashes by special processes in the nervous system; it is basically bodily feeling, the body as felt — the ‘lived body’ is sentience.

From primitive forms to ourselves, the registration of the natural world in sentience is copiously exemplified in the felt response to the experience of seasonal changes, the weather, and climatic conditions. All this is related to the flow of energy into and through the organism from external physical sources, and to the felt needs of its body and the supply through its physiological and behavioural activities. It is believed that primitive sentience must be pre-conscious. But it is the material content of all consciousness and becomes its immediate object. How far down the evolutionary scale sentience occurs, and at what level consciousness proper emerges, is of necessity a matter of speculation and can only be inferred from the behaviour of the organic body. It is hard to believe that the behaviour of Paramecium and so on, is not prompted by sensibility to outside influences. How is the response to lack of oxygen possible unless it is somehow sensed? No inorganic reducing

substance can migrate to seek an oxygen supply, however we may imagine that it is some way sensitive to the presence of oxygen when that is available. Such imputation of sensitivity in physical bodies to physical forces is only metaphorically justifiable, except if one advocates panpsychism. But the hypothesis is not necessary if one regards holism as a matter of degree — a higher degree of wholeness than simple chemical combinations, for instance, or physical cohesion. The relation between sentience and consciousness, at any rate, is one of degree, if only of clarity and articulation, and that in the evolutionary scale the latter must have emerged out of the former gradually, and probably concomitantly with the development of brain capacity and organization.

In thus bringing itself to awareness, the universal principle of wholeness remains immanent, as subject, in the experience; and without such immanence the experience could not be true. The immanent universal is what Kant called the transcendental synthetic unity of apperception. It is what constitutes the self, as distinguished within the sentient and conscious whole, a transcendental ego, transcendently aware both of itself and its other, and cognizant of the whole immanent in its own experience of the world.

### **Attention, Consciousness and Cognition**

Attention selects an element within the felt whole, distinguishes it from the felt background, and creates a figure — and — ground structure within the psychical field, making it an object for consciousness, which is this way directed upon it. Consciousness thus varies in clarity and definition with the degree of sharpness and articulation of attention. There is no consciousness without an object which it is intentionally directed. Whereas sentience does not, consciousness does imply the distinction between subject and object. The object is, as it were, projected and held 'before' the subject, which contemplates it as a whole. Consciousness has been compared to a searchlight playing upon successive objects and illuminating the surrounding landscape; it is an activity. While it presents itself as hierarchical structure, it also has the capacity to extricate itself from it all and grasp the whole, the general form; in some way consciousness is also self-transcendent.

Attention, creating the object, by singling it out of the psychical field, is thus initiation of consciousness, the experience described as cognitive when perception is born. Concurrently, the various sense modalities are distinguished. As objects are related to one another and to the body in which sensation are felt, self becomes opposed to not-self, and an outer world is built in which the subject is conceived as one member and the organism that it inhabits is placed to its encompassing environment. It is in the virtue of the

self-transcendent character of consciousness that the mind reaches the point at which a fresh fresh transition, a further self-enfoldment, takes place: the stage at which self-reflection is achieved.

It is the crucial point at which the self becomes aware of its own identity and knows itself as 'I', at which it makes itself, along with its ideal content, object to itself as subject. Here the mind enters upon the stage of self-reflection; reflection upon the nature of its objects and its own relation to them. This is the dawn of intellect, the birth of wonder, and the awakening of self-criticism and self-appraisal. Reflection is the distinguishing mark of the human. Without it there can be no morality, no civil society, no science or philosophy, no art or religion, no materialism, no behaviourism, no scepticism, and no theoretical deconstruction; and the first fruit of reflection is the indefeasible revelation to the self of its own existence. Those who remember the traditional idealistic problematic will no doubt wish to challenge this account of the emergence of knowledge, to ask how, if the life-world is thus constructed from the contents of the sentient field, we can ever know whether anything in the outer world corresponds to our subjective construction. The question is however misplaced and misguided. Objective and subjective is a distinction made within the life-world, which the experience embraces as a whole. We can in no way get outside our own consciousness. There is no outside, if only because outer and inner is an opposition constituted within experience.

### **On Complementarity**

In modern scientific terms, the Principle of Complimentarity, based mainly on the work done by Neils Bohr, stresses the ancient viewpoint at least seemingly in essence at least. It states that the seemingly opposites or what one at present calls irreconcilable points of view need not be contradictory. In fact, on deeper analysis are mutually illuminating, i.e., these are part of the same totality, seen from different perspectives (Kothari: 1989). At the social, ethical level, like the uncertainty principle mentioned elsewhere, one is allowed for the possibility of accommodating widely divergent views and human experience. From the scientific viewpoint of the educational curricula, this needs to be emphasized. For example, thinking and thought, how they arise and how one gets an idea which have existed goes on infinitely; and this infinity is enclosed in an instant, moving yet not moving thoughts, like Zeno's paradox of an inexplicable contradiction. This is like matter (brain) and consciousness (mind) that are complementarities. This is what Pauli has stated in his Pauli's Extension Principle, the oneness of quality and quantity, matter and mind. Thus scientific principles are applicable to life too, we just have to look at these at the subatomic levels, of which we are made of too. It is easy to see how scientific knowledge has allowed for the possibility of giving new meaning to

words unlike those that exist in ordinary language. Even in mathematics, concepts like Infinity lead to contradictions, or what Godel's theorem tries to prove. Thus the ambiguity of ordinary language can further undergo changes to provide insights of greater understanding between human mind and reality. Not that this is not known in Buddhist, Jain, Upanisadic ethics and philosophy. But all this has to be relevant in our times by our own discoveries and perceptions, and in terms of scientific understanding and technological developments. A new vocabulary, a new language, a reinterpretation in terms of contemporary needs and society is essential. Insights (as ancient these might be) need to be experienced again and again and restated, afresh. As said earlier, truths have to be said anew for our own purposes albeit supported perhaps by earlier ideas (or *vice-versa*) which confirm our experiences and insights. Each age, generation has to do it over and over again, afresh. Each one has to stand on its own feet, breathe first hand and feel for itself whatever it is now; and be a lamp to one's self. And, this has to be manifested over and over again in its own unique yet universal way. In this way there is fresh creation, moment to moment, age after age. In an abstract sense, there is nothing new of course, unless it is experienced in that perception-action manner, in a timeless yet creative way. Yet this is not a paradox, i.e., I am the same yet I am different or *vice-versa*; I am moving yet am not also.

In an abstract sense, pain, hunger, feelings, and all that is the same for all of humankind. These experiential states are beyond any socio-cultural boundaries. Nevertheless, the universal nature is forgotten by narrow boundaries of conceptual notions; and also it must be remembered that each experience is unique even if its cultural manifestation is bound. Thus there are unique and universal states at the same time. Several such paradoxes may be mentioned; being and non-being, I am and I am not, etc. These pairs of the binary systems from the phenomenal world in Upanisadic sense has been stated by many, and some examples are given as:

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|----|-----------------------------------|-------------------|
| 1. | Noumenon and Phenomenon           | one is the other. |
| 2. | God and Nature                    | one is the other. |
| 3. | <i>Sansara</i> and <i>Nirvana</i> | one is the other. |
| 4. | <i>Brahman</i> and <i>Maya</i>    | one is the other. |
| 5. | Self and self                     | one is the other. |
| 6. | Thought and Time                  | one is the other. |
| 7. | Self and thought                  | one is the other. |
| 8. | Knower and Known                  | one is the other. |
| 9. | Renunciation and Enjoyment        | one is the other. |

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|-------------------------------------|-------------------|
| 10. Action and Non-action           | one is the other. |
| 11. Being and Becoming              | one is the other. |
| 12. <i>Vidya</i> and <i>Avidya</i>  | one is the other. |
| 13. Birth and Non-birth             | one is the other. |
| 14. Work and Knowledge              | one is the other. |
| 15. Spiritual and Phenomenal Nature | one is the other. |
| 16. Subjective and Objective        | one is the other. |
| 17. Actor and Spectator             | one is the other. |
| 18. Future and Past                 | one is the other. |
| 19. A and not-A                     | one is the other. |

etc. etc. etc.

The problem asked, the questions that arise are in themselves having the answer, since the two levels are not distinct and contradictory except from the purely limited phenomenal viewpoint. How is one to make a jump, a quantum jump which is required of one to the other, since it is a continuous transition, a gradual movement up the ladder. But this is not the way, i.e., from the finite self to the infinite self is not possible, through time-thought. If the latter was possible it would have happened again and again in these 5000 years. But it has become worse with repeated attempts. Of course there are complementarities of higher and lower levels when one conceptualises the issue. But the simplest and best understood complementarities is that of the wave-particle duality in physics. In brief, in ordinary language it means simultaneity, coupling of past and future, in every observation which implies freedom of choice and objectivity, i.e., free will between mutually exclusive alternatives, is in a sense a participation in genesis, i.e., actor and the spectator.

The observer and the observed are not two separate entities as was revealed by the discoveries of quantum mechanics in 1920s. It was assumed until then that such objectivity was possible, as the world of matter consisted of discrete entities and man was a distinct entity, at least in principle. But this picture has changed, of the self and the other which are part of the whole, if one were to project to the human world this subatomic reality. At the subatomic level, the interaction is not predictable, and therefore the unpredictable nature of things is inherent in their very nature, according also to Plank's constant. This is to say not only atoms, their physics and chemistry is what humans are also made up of. We all thus function in a unified system, for anything to happen at one, everything in the universe has to participate for it to happen and unless



this is so, nothing will actually happen at the conceptual level. Hence all the suffering we see all around where one sees one's self as a separate entity unrelated to all else. The words perhaps cause the problem. In physics things can no longer be explained simply and be describable so easily. This is not to say that all the work done in physics is not objective and scientific. But it provides an insight into the working of all of nature, of which man is an essential part.

Thus, scientific truths and ethical truths are not contradictory but complementary.<sup>1</sup> There can be no advancement in science without some measure of ethics in society. Equally, on the other hand, in the modern world there is not much room for the practice of ethics without science and technology. In other words, the quest is for seeking a unified field in science and in other areas, of a unity in nature and man. But it all begins with a personal yearning. Throughout human history, in every endeavour, human beings have searched for connections, for ways to make a harmonious whole out of the parts. Today, the Holy Grail of modern physics is the Grand Unified Theory.

To be asked is the question, is there a unity, in fact, say in the brain or the interpreter sitting in it, since the unity of thought is an illusion? The brain has a multiplicity of functions and voices that speak independently. But despite the fact that the brain is multipartite, it represents itself to the mind as unified. Were conscious selves fully unified, we would feel justified in concluding that for all the disparity of its parts the brain is in truth a fully unified system. But, instead, we find that our sense of the personal unity and command over the brain is something of an illusion.<sup>2</sup>

So, is the idea of unity and its quest a mere assumption, does unity really exist? In the world of art this assumption may depend only on aesthetics but in science, it would seem some concrete forms have to be taken into account. The assumption of Lovelock, for instance is that there is probably a mechanism that will reduce the carbon dioxide in the atmosphere when it is too low for trees; and particle physicists assume a single force that produces electromagnetic forces, gravitational forces, and nuclear forces. Nature may, or may not accommodate these assumptions. Paradoxically, as science digs deeper into nature, it uncovers alternating layers of unity and variety, simplicity and complexity. Copernicus's sun-centered cosmos was simpler than Ptolemy's earth-centered universe, but twentieth century astronomers found that the sun is merely a resident in the suburbs of the Milky Way galaxy. The atom was once the indivisible unit of matter; then hundreds of subatomic particles such as neutrons and protons were found; then the genealogy of this multitude was simplified by tracing their lineage to three constituent particles called quarks; now the number of quarks has grown to six or more.<sup>3</sup>

Twentieth century has thus exploded a metaphysical bomb, namely, quantum physics. It shows that the scientist is inextricably tangled with the objects she observes, as no longer is she a passive observer as it was believed one could observe the pendulum swing without changing its motion. Chemists believed they could measure the rate at which coal burned in air without altering that rate; naturalists believed they could quietly listen to a sparrow without dictating its song; and scientists assumed they could put a box around their subject and peer into that box. Quantum physics has shown that scientist are always inside the box. The answers scientists get to their questions depend on the way they ask the questions. Thus, the enigma of whether unity exists outside the mind of the scientist and dissolves in a mist of ambiguity and meaninglessness. A baffling experiment in quantum physics, called the double-slit experiment, demonstrates how 'the observer' finds that he is not really an observer but part of the experiment. Without going into details of it the baffling part is: How does each electron know in advance whether there are additional detectors behind the openings? How does each electron know whether to remain whole like a golf ball or to subdivide and spread like a ripple on a pond? Somehow, the properties of the electron depend on the mind asking the questions.<sup>4</sup>

### **Physics and Biology**

Ernst Mayr in his *Towards a New Philosophy of Biology* (1991) asks the question, Is evolutionary biology a science? If so, what kind of a science is it? His central theme is that the concepts which underlie evolutionary biology, make it an autonomous science, and not merely a subbranch of physics. Not that he does not believe in the unity of science; in particular he believes that the law of physics and chemistry are the same in living and inanimate matter. The claim for autonomy rests on the existence of concepts — for example, natural selection, genetic programme, species — that are needed if we are to understand biology. These concepts are consistent with physical laws but could not be deduced from them.

In distinguishing between physics and biology, he points to the different role of laws in the two sciences. In physics, laws are intended to be universal. Such laws do exist in some branches of biology. For example, the "central dogma of molecular biology" that information can pass from nucleic acid to protein, but not from protein to nucleic acid, is intended to be such a law, universal as far as life on earth is concerned. As yet, there is no convincing falsifying evidence. The law is important for evolutionary biology, because it provides one explanation for the non-inheritance of acquired characters. In evolution such laws are hard to come by. Even the law that acquired characters are not inherited has exceptions, because not all heredity depends on the sequence of

bases in nucleic acids.

The message is that evolution is contingent. It is not the case that, initially, there were a few simple organisms, and that, as time passed, there was a steady increase in diversity and complexity, leading inevitably to the emergence of an intelligent, tool-using, talking animal-ourselves. If there was a replay of it all again, there may not be chance for the same to be repeated since it is a matter of chance which body, phyla, survive; no guarantee or likelihood of the emergence of vertebrates, or mammals. Evolution is not a stately law-governed progression leading inevitably to human intelligence.

Throughout evolution function has preceded the organ through which it is to be exercised; the organ developed in response to a need. So why should the brain be any exception? In other words Intelligence came first, quite able to function in its own realm. Working from such a premise, is it not true that life, intelligence, and consciousness are primal realities? Is it scientific heresy to suggest that biological forms are secondary events, to the primary substratum? It is somewhat ridiculous to maintain the position of a mechanistic, chance creation which insists that thought originates and depends upon the physical brain. For example, with regard to the brain, no special 'box' equivalent to the computer's 'memory' store has been identified; nor is memory to be found in a particular cell, synapse, or chemical molecule. All experience is not stored in the brain (Smith:1975). Today, physics and other allied disciplines are clear that there is a non-mechanical reality more like a great thought rather than like a machine-mind is no longer an accident of matter but the creator and governor in the realm of matter.<sup>5</sup>

## **On Consciousness**

In the modern world most explanations are mechanistic interpretations of the processes of life, such as, that it is in the brain that consciousness appeared as an epiphenomenal process occurring in evolution. But this is like a dreamer explaining a dream while asleep. It is explaining consciousness through the mechanism of the brain, which itself is the product of the mind — Universal Mind or Consciousness. It is like looking for the programmer in a television set, or a radio set, in its tubes or circuits, etc. which when taken out would cause some disturbance of the audio-visual programme; and this would then be attributed to a part of the set as if something was located in that part of the set (brain). But all the while forgetting that apparently there is some logical connection between the part and the dislocation, nevertheless this is only a receiving set, since the broadcast is being transmitted from elsewhere. All the problems, conflicts about the brain, soul, existence and so on are part of the individual mind's own firmament and have no existence apart from

Consciousness or Intelligence. Those who try to prove that the mind begins and ends with the brain, can only testify it or not with the mind alone.

It appears falsely so, that the mind is a mere bio-chemical activity. But this has never been proved, shown or analysed. The linguistic and languaging powers located and residing in the brain is not the mind, i.e., the tape or commentary, and the audio-visual apparatus is not the mind or its dynamics. The enterprise of social sciences and sciences is based on this notion of the mind — again a statement of the mind, counteracted in the mind itself by an opposite statement! This is the game a language plays, as mentioned elsewhere as the dual nature of thought (Malik:1989,1993). In any case, consciousness cannot be known through rational language left-brain activity, nor can it make it to the ineffable and indescribable through all its striving. This is not possible by the intellect any way; it can only deal with matters agreed upon by the social set up and thus must realise its limitations. Nevertheless, many of us desire to know or have an experiential state. This is only possible through an intuitive mystical knowing and not by the left-brain language categories. But is this knowing located in the individual brain or the mind? The brain-body mechanism is an instrument, a very sophisticated one at that but, self-referentially, like a computer it cannot know about these intimations which are beyond its limited sphere. The issue at the moment is not the functioning of the brain, at any rate.

The essence is thus missing, an aspect that many today long for; it is a consequence of the agnostic intellect that feels essenceless and dry and hence is having a dream of itself. There is a possibility of these brain activities being connected to biochemical workings. But is it all the by-product of such mechanical activities? If so, who or what is the knower? Surely, it cannot be a transient derivative, arising out of the atoms or molecules of lesser known matter. If so, how can it answer questions regarding creation and existence, or what is real or unreal? All this occurs in whatever this mind or no-mind maybe; the questions and answers in the mind-stuff itself, its debates, the arguments, the verdict and those against it. There are in this sense no others actually, it's all **Me**, the Self or Consciousness; being the sceptic, the judge, the opponent, the believer, the non-believer; and all our hopes, ideas, theories, doctrines, concepts, etc. arise in the mind and subside in it only. It is like lines drawn on water, and vanishing as soon as they are drawn. All the stuff going on is the universal stuff itself — the rays of sun is the sun. Is not matter then nothing but the Universal Mind or Consciousness ?

And, what is the mind, without Consciousness, and that too in the shoreless, measureless ocean on whose surface it arises like foam. And from the mind arise various universes that appear very tangible, which they are not except to be seen as metaphors of another dimension, another reality. Both the universe and our personal observing minds would not exist but for an omnipresent

Intelligence. But all modern goals run counter to this embellishment of the brain's desire for spiritual needs; it craves merely of food for the body and bodily comforts and material wants. Even the atoms and the subatomic particles are not everlasting, albeit they are part of the universal energy present everywhere; even protons consist of jumping up and down quarks that are omnipresent in and out of the body. Thus, the two clash. The current trends thwart the opening of supersensory channels, and this course of collision is malevolent functioning, not the benevolent plan of nature to move to the Omega point of Chardin (1959).

Consciousness may be seen as transcendental and immanent from the human viewpoint, but this is not so by itself; like air, it is everywhere and where is it not? Is the space inside and outside the building different, except until the time the building is there and the moment it falls off, the space is once again one — it appeared like two, inside and outside, only because of the building being the focus of attention.

This knowledge of Consciousness is known by Consciousness (the mind-stuff); it partakes of itself through various ways in the functioning of the brain-mind's confluence. It itself is the knower, the known and the knowing, of its significance. It is known or seen when the general facilities are open in the brain-body mechanism that is a vehicular instrument — an instrumentality. For example, the occurrence of paranormal telepathic communication, etc. for which there are many examples ( the photographer who got lost in the jungles of the Amazon and began to communicate with the Shaman of a tribe non-verbally and he communicating among other things that the tribe is moving away from civilization since the more it contacts it the less its ability to communicate non-verbally!) But much the same fate awaits them, as it has been the case with other non-Western cultures in America, Africa and Australia. Contemporary science, despite evidence to the contrary in even one's personal life, is ignoring it. Perhaps, because it has neither the tools or means to verify it and it is so, since the rational-theoretical models are limited by their own frameworks of scientific instruments, which are extensions of the five senses only and cannot detect the sixth sense areas, an atomic reactor would be the wrong laboratory for it. The laboratory and its verifiability would come from another area or dimension, beyond current scientific vision at the moment, i.e., its assumptions do not take these areas into account at all. This is another kind of dogmatism and fundamentalism. The essence of Knowledge, of Mind and Consciousness, and of the notion of Self, when absent from the entire universe of discourse, can one really get at any other actuality, a dimension of reality and leave aside Truth?

Of course, if such extra-sensory perception was amenable to empirical scientific verification, especially moments of personal-impersonal existential-experiential states that are taken to have some validity, this would become a

fearful threat to all that has been invested all these years into the current state of knowledge — theoretical and practical — in the world. Such a state would shake the foundations not only of social sciences and anthropology, but even one's own life at all — individual and collective — levels especially one's relationships. To point out the reality behind our obvious phenomenal world, would be to create a void; one would be in a limbo, a transitional state between the known and the unknown. One is referring simply at the moment to the mystical dimension — not the mysterious — that is known and knowable but not by any so-called concrete means. These are areas which are governed by laws beyond those of space, time and causality, states which one may call meditative ones. These are therefore not beyond anyone's means, or beyond directions of research separate from the 'material' empirical one of science and social science — beyond one's scope as one may imagine. The primary aspect of consciousness is of crucial importance. This is part of a human-being's mental-experiential aesthetic-states which were as much familiar to the pre-industrial man as a way of life, as today's non-industrial communities. These are states expressed in their life-styles, states of mind that manifest the grand creations and expressions seen in all civilizations. All this is beyond the rational-empirical methodology of a positivistic and reductionistic philosophy that has so determined modern life, to its own detriment.

Obviously, Consciousness exists in all states, during wakefulness, dreams and in sleep — since there is a knowing even while dreaming, even in dreamless states when one gets feeling so fresh, not remembering one's name or problems about the body. If this was not so, one would not know that one slept well and it would all switch off if it were only an epiphenomenon of brain's activity. It would seem as if there is a kind of Witnessing to various activities by Consciousness. But we dismiss all this since we have separated the observer from the observed. The external evidence of the study of societies may not indicate all this, since one has eliminated consciousness and mind as the subject of study, how can one show this dimension by gross tools of measurement? It implies that the sense of history will also be different, since the past, present and the future becomes an awareness of the **now**, the *bindu* of Now, the big-bang is happening Now. The Now, Now, Now is all a Presence! How does one know anything, without taking into account Consciousness or Intelligence, one may ask?

Science is irresistibly coming to the conclusion that there is no separation between the observer and the observed; that matter by itself cannot observe itself. It is awareness — Consciousness — that creates this division; how this mysterious division, this separateness takes place — of the drop thinking it is separate from the ocean — forgetting its primary existence; this perhaps is the veil of *maya*, or *mahamaya*. The awareness to see this screen created by the ego which believes it is the supreme entity to do so is to identify with the Being of a human being. It is to know that the One becomes the many and the latter

also being the One. But the discovery of this universal has to be discovered uniquely in each experience, paradoxically, at each moment by an personal-impersonal state, over and over again newly every Now, in the Now. That is the game.<sup>6</sup>

As the basal substance of the universe, how can Consciousness cease to be or die? Consciousness, to use an old analogy or even in terms of physics, that there is an infinite ocean of energy in which matter, condenses in many forms without any diminishing of the energy which is prevalent everywhere 'within and without'. This is the boundless ocean, void which is full, which is dotted with globular icebergs of colossal proportions floating in it, of matter. Our senses know only the tip of the iceberg, they cannot feel the imperceptible oceanic waters of Consciousness which includes space, time, etc. albeit it is beyond all of its contents, i.e., the Context of all contexts is a limitless, infinite creative energy of a universal order which is beyond even any conceptions of the brilliance of a thousand suns. Normally one sees merely the ice-formations and that conceptually and intellectually one imagines or believes, or does not, the rest. But in a silent state, beyond words or chatters, in a purified mind-state without the 'me', it is possible to catch a glimpse of that state of eternity, the eternal moment of Now or Presence, of *Samadhi*, of a union or *Yoga* beyond duality or multiplicity. In these states the ice-formations, the tips or gross matter vanishes as one knows its superficialness and ephemeral nature. One knows the boundless energy, the ocean of pure effulgent light. It is now all '**me**', as Sri Krsna says in the *Gita*, either in the pure state, or in its multiple states like seeing light through a prism (the mind-brain complex) which is still the same light — just like the often stated jewel-gold metaphor. Thus is Immanence and Transcendence One, as it always was, is; it is one in all and all in one, witnessed in mystical experience, in the moments of Now, when the 'me' vanishes — states of ecstasy and bliss knowable in everyday mundane life, not as something exclusive. It is the '**me**' experiencing itself in all its activities through its creations of the so-called other which is itself, for what is it that it is not?

Thus, this is the only conceivable theory of creation one can frame being consistent with the latest trends in physics and the mounting evidence posited by the study of extra-sensory perceptions. Call it soul, spirit, or whatever, it is that, and sees its own glory unhampered by the senses perceived by the 'me'. Is this not Saivite, Vedantin, Sakti, Vajrayana Buddhist or Tantra philosophies too? These *turya* and *turyatitta* states are knowable and experienceable by one and all, we are told, as it is the self-reflection and self-perceptive powers of that which **is**. What clouds it all is the dust gathered in the mirror of the mind — the memories of pleasures, pains, regrets, resentments — which distorts that One. It needs cleaning every time, not any different to breathing that must be done every moment afresh; or that dusting of the house has to be done every day and not once for all, in order for it to reflect truly. This is the awakening of

the mind, created by the mind itself, for a new transformation, a vision of the discovery of the **being** for this is who one is, always was — not who one thinks one was, is.

As indicated above, we understand the world in a topsy-turvy manner, i.e., the world seen by the senses is real while that which allows this to happen is unreal or abstract. But the opposite is true, i.e., the world of senses is governed by a mind-set socially conditioned through concepts and images represented symbolically and is therefore abstract in fact. This is the commentary which one takes to be real, whereas the action is at the experiential level that is indescribable beyond words — even like the taste of water. To know this, one has to wake up from the conditioning. Then one knows that it was always available, it is, provided one stops clinging and hanging on to the known.

Contemplating in this manner creates problems since the social system one lives in feels threatened by these manifest expressions and statements, for these go against the old generalisations of mostly the nineteenth century notions, ideas to which most of social sciences and even science in many parts of the world where it is equated to technology and scientism, continue to cling to. Not all of the current states of science perhaps accepts this notion of an ocean of Intelligence, of a universal energy or a unified field. If it is so, it has not penetrated to the larger society of scientists or society at large. It also speaks of an attributeless, nameless and formless energy; all name and form fixed in any way will limit it. How does one know it, then? It is like light or electricity which is known by its effects in a cognisable form as such by our senses. The infinite is present in the finite albeit often in a diluted form, as it is often clouded and limited but reveals itself when awakened and purified, this body-brain instrument which in its subtler aspects is light and sound vibrations speaking in material terms. The universe is a Play of Consciousness, *Krsna-Leela*; it is the clouds that hide the sun which is always there; it was not so that it never was, it is.

## **Mysticism and Science**

The movement from a religious metaphor guiding the ancient past to a scientific metaphor of modern times continues to go further ahead, since the latter is increasingly being recognised as incomplete for telling us about the various contemporary issues, the crisis, such as environmental pollution, ecological imbalances, and so on. The modern movement marked a departure from the old dynamics of life when humankind lived closer to nature, sustained and motivated by an understanding of our higher nature — an understanding that came easily and naturally to them; as against the confidence of the modern era to achieve better living conditions, through progress in terms of conquest of nature — introducing both physical and psychological new



parameters, separating man from nature, from the universe and hence not being responsible for an overall harmony by being subservient to the cosmos, but pretending to be the dominant force himself. Thus being good and bad became mere matters of technical feasibility, since moral, spiritual and other dimensions had little to do with material solid practicality of material comforts. Now, all this is outdated in view of some developments in Science which are ahead of the times, ahead of this reductionistic paradigm which alienated man from the cosmos. It is in this context that scientists are moving in both the inner and outer dimensions, science and religion, between matter and consciousness even if physics and chemistry are inadequate to deal with such problems since so far science has no moral dimensions to it (Weber:1986).

Physics has developed wonderfully and become very important, interesting and a useful science. But it is not very self-consistent, and it does not even try to cover the existence of consciousness or life. Also quantum theory and relativity are not really reconciled with each other. More investigations are necessary. The description of the world and its unity by quantum theory is very different from that of old-fashioned physics, that is macroscopic physics and also that of general relativity. But contradictions in physics are noticed in a particular theory or system of logic only when we apply it to a new situation and the theory predicts results that are not compatible with the observed phenomena. And, this may be understood in terms of quantum mechanics that describes probabilities — probability connections between subsequent observations. Sciences thus speak in terms of approximations, and this is good since physics deals with inanimate nature. It has not gone into the study of Consciousness, just like at one time it did not consider itself ready to study microstructures, as atoms and molecules. Earlier physics dealt with magnetism, electricity and mechanics, etc. So today, while it deals with atoms and molecules, nevertheless human beings are more than just that. Yet, sciences do not yet consider consciousness to be part of their study — no more than the social sciences and humanities unfortunately do. Perhaps because consciousness is considered something non-physical, since the definition of physical is restricted just as Newtonian physics considered atomic physics outside physics. Today, even chemistry and physics is incorporated within each other, if not biology or microbiology.

Perhaps new tools and language is necessary to understand consciousness, just as it was necessary to develop a new tool to understand chemistry, i.e., quantum theory. The questions then raised would be different, does self-identity demand consciousness, or does the latter create identity, viz., I know that I am I because consciousness tells me so; is it a product of something, as an emergence of evolution more or less accepted by everyone, or is the quantum of consciousness in every living entity the same in its nature or ability? The mechanical nature of each body may be different. Maybe just as atoms are not products of something, but are certainly state of matter by transformations, so is consciousness a state of being. Maybe it is either a

transformation of matter or it is totally a non-material principle. At any rate, in terms of present science of physics and chemistry, a definition and description of matter will not tell us about consciousness; just as one could say that Newton's theory did not describe the emission of energy, heat and light by the sun — maybe it was not expected to, even though the sun was always there. Today one speaks of heat and light as transformations of material energy. Maybe a basic ground work of theories will have to be changed to include a study of consciousness — something new has to be introduced, a new art and laboratory of observation, i.e., consciousness itself becomes a baseline for the art of observation — it is observing itself ! It involves a shift from particular entities, atoms and the rest as discrete entities to relational phenomena of events as Alfred Whitehead suggested. Physics and mathematics is no longer unidirectional in characterising things, these are processes and probabilities. Maybe this is more akin to the processual idea of Buddhists, rather than that of individual *jivas* as living beings as entities, existing separately (Weber: *Ibid.*).

The suggestion is that it is important to live in an open-ended system, as a human-being and not merely as a good scientist; for example, molecular biologists think that the whole of nature of life can be comprehended in terms of molecular biology — this is a mechanistic way of thinking, this is what science is about and that is all that matters. Thus, the open-mindedness of science is limited within established ideas or paradigms — just as many religions also say the same thing, or social scientists who think that the framework or content one is examining is the whole thing itself. Although the rational approach is very useful in many productive ways, it has ignored psychological and spiritual dimensions, especially the area of consciousness — areas often relegated to a waste of time, or stupidity. This narrow vision, extreme specialisation — while at the same time claiming open-endedness — is very neurotic and hence destructive, consequences that are very much upon us in this century. For example, even the role of intuition is not recognised in the work of the scientist himself, or his own creative process of which little is known — not to speak of knowing himself before knowing the universe.

The unity of things, man and nature, consciousness and matter, inner and outer, subject and object — these can only be reconciled not only when there is no separation between one's personal and professional life but also when exploring their unity, and seen as a spiritual odyssey — no separation between creative scientists, artists, humanists and the Sufis, saints, sages and mystics — no reference to conventional scientists and religious figures and institutions. This struggle for harmony, for integration and a search for wholeness is a priority with which nothing else can compare. A coherent vision is possible by searching for deep structures, whether in nature, the area of brain-mind, or mystic realms — this is not possible through contemporary analytical philosophy which has become merely intellectual, ignoring simplicity and unity. The move towards metaphysics from physics, or towards unity, has as yet penetrated only a minority of the researchers in all disciplines. The search

for wisdom is as yet suspect, if not outrightly ridiculed. For any search for a holistic perspective, rigorous examination is necessary both in science and the study of consciousness. This is said emphatically since it is erroneously thought that methodology may be dispensed with in this search for wisdom; the objection is to all isms.

The philosophy of science rests largely on empirical methodology; involves formulating one's hypothesis, subjecting it to empirical experiment via carefully collected data that verify or falsify the hypothesis, in order to draw conclusions that will become a theory or perhaps a law — using equation and mathematics which is its handmaiden. Science is thus concerned with concrete details and abstract reasoning, between inductive and deductive ways; it has a very sophisticated structure. However, unless the thing at hand under study is both itself and something beyond itself, it loses meaning or becomes destructive in the long run — as we see science and technology turning into scientism and empiricism. Scientific details only acquire meaning when they glow with another metascientific reality. The collections of sense data about data is not a mere collection but depicts not describes, like poetry and art does a single reality of grandeur and beauty, which may be experienced on multiple levels — only a handful of scientists like Einstein express it publicly. Feeling and experiencing this oneness is, if it must be defined, mysticism. Science, originating from philosophical searches, also arises from the idea of wonder and awe; there is both an ethical and aesthetic side to it. Perhaps now it explains the mystery of being, while mysticism experiences it; the former is limited while the latter is unbounded. Nevertheless, both seek unity, a unified field of existence which forms the link, the substratum. What is this, and how is it tied to the existence of the scientist itself? It is possible that now one is speaking of a realm that is beyond language, schema-symbols too feeble to translate that ineffable domain, of Silence. Nevertheless, it is knowable, communicable even if whatever one says about it becomes an untruth. Like in physics, there can only be approximations of the statements one makes.

Perhaps, one may call science outer empiricism and the inner exploration as inner empiricism, then the common ground is unity, linking the microcosm and the macrocosm, nature and man, the observer and the observed. Max Planck acknowledged it well, "Science cannot solve the ultimate mystery of nature . . . because in the last analysis we are ourselves part of nature, and, therefore, part of the mystery that we are trying to solve." Man, however, is the crucial clue to the mystery himself. From time to time some scientists have realised this, and the relationship between mysticism and science is re-emerging in a modern form of the ancient relationship between the two approaches. But are these two reconcilable: one is quantitative, the other is qualitative; one's methodology is rigorous formalisation, the other's meditation; one's mastery is over gross matter, the other is over subtle matter (of inner bodies and so on) which has its own laws, logic, insight and workings analogous to science. In the latter too subtle matter has begun to appear in the

theories of the twentieth-century physicist; it is no longer value-free even if it is cognitive in nature and understands phenomena by piece-meal analysis — precisely its weakness. The mystic's laboratory is the inner one, and of course in this quest he may equally be lost, forgetting the outer particular things. There is thus a relationship between simplicity and multiplicity, the universal and the particular. Viewing it like this, for instance in chemistry in a homogenous solution chromium stays invisible until it is coaxed to reveal itself through some appropriate steps; similarly there is the enigmatic metaphor of creation in the *Svetasvatara Upanisad*, " Like butter hidden in cream is the (pure consciousness) source which pervades all things."

In short, in Indian cosmology, the phenomenal world is the solid, the precipitate which becomes crystallised in space and time by cosmic consciousness in which it floats. David Bohm speaks of the implicate order cosmology, with its schema of dense and subtle matter, referring to a single source underlying the universe. Immanence and transcendence becomes one — divinity in everything — in this model where the finite unites with the infinite. The universe is materialised *Brahman*. Such a reversible equation recalls Einstein's equivalence of matter and energy, and the particle and wave identity of quantum mechanics. One may even go to the extent of saying that it — mysticism — that is pursuing with ruthless logic the Grand Unified Theory — the one that includes the questioner in its answer. Science wants to leave the scientist outside this search.

Perhaps, the dilemma that while it is easier to deconstruct nature and the other exoteric stuff by the mind, the latter as ego finds it difficult to deconstruct and reconstruct itself. For, in both cases in doing this that an enormous amount of energy is released. The binding power which keeps the atom together and the ego in another sense, will only reveal that energy and dimension hitherto undreamt of, so to speak. Like there is no ultimate building block, only transformational energy, so there is no fixed entity as the personality, independent and free. Once this is clear through different methodologies, techniques, the resultant staggering energy is a channel to limitless universal energy — Cosmic Consciousness. In both cases, it is the unfoldment of immense energy — potential in nature and the human realm through the substratum which one was seldom aware of experientially. This is not hair-splitting but atom-splitting and ego-splitting ! Both are arduous paths that cannot be treaded lightly, since both require an attitude of sacredness — otherwise it becomes negative, pathological and destructive as we all well know by now both in physical and psychological contexts.

These states of the release of energy are quantum transformational jumps with all kinds of possibilities; the mystic altered states of consciousness, harmonise the awareness of that individual, as in some ways his awareness alters the subatomic structure of which he is made up of to the deep structures we referred to above. In this sense, the mystic is a true alchemist since he brings

the micro and macro levels together; he lives psychologically in the mode of creation, manifestation, dissolution of every particle of subtle matter and energy — he can let go and dies to each moment so that the next moment is afresh and a rebirth. In short, he lives in the timeless present, the **now** — the **presence**.

Scientists too talk of beauty, elegance, the good and true of reality, in this search for the Unity; it is not merely a mechanical search of an equation, or a single comprehensive law, in a conventional sense, bereft of aesthetics. In this sense its search is also spiritual, since behind the intellectual drive of the great creators of science, a deeper force is at work. Without this idea or something like that, if one hesitates calling it consciousness or intelligence, it is difficult to account for the way scientific genius operates, as behind the multiplicity of appearances lies the unity of an intrinsic reality.<sup>7</sup>

All this is not to devalue science, but it cannot answer questions as, what happened before the Big-Bang, what lies beyond the edge of the universe, what started it and why? Mysticism at least points to a direction, i.e., universe originates in consciousness as subtle matter which gives rise to dense matter, but all matter forms a continuum. The subtler the matter — purer the mind — the closer it gets to consciousness and ultimately cannot be distinguishable. But neither matter nor consciousness, even if they form one continuum are, according to the mystics, the ultimate. Both have a source in something which is beyond themselves, and cannot become an object of knowledge — not even in non-ordinary states of altered consciousness when there is unity of space, matter and consciousness, minus the person, or the ego.

In these ontological-experiential states, the distinction between inner and outer space, nature and self, consciousness and matter are lost. If science produces pure energy from dense matter, the mystic way transforms the dancer as the dance itself, as Consciousness is aware of consciousness itself. As is the Zen saying, "The eye which I see is the very eye which sees me". The participatory universe, however, demands a dialogue, in terms of the I-Thou experience of Martin Buber. Dialogue reflects the insights of each partner at this moment in time, and does not negate the fact that another moment may call forth another response. In this sense, dialogue is creativity, exchanging energies and insights, adding something afresh to the happenings of the universe in this encounter. Scientists like John Wheeler, Prigogine, Heisenberg, and others support this view and advocate it. Bohm goes even further to state that meaning is a form of being. In the very act of interpreting the universe we are creating the universe. Through our meanings we change nature's being. What the cosmos is doing as dialogue is to change its idea of itself in its questions and answers, its struggling to decipher its own being (Weber:*Ibid.*).

## Conclusion

Correlating matter with consciousness in science, has been a long-standing puzzle. Recent developments since 1970 in cognitive science has attempted to unravel this puzzle somewhat. Especially the developments of quantum physics and chaos theory have shown us that in any strict sense, science cannot predict and control always. Some say that after a certain point in time, in evolution, consciousness comes into play which is qualitatively different than reductionist causes of science. Maybe the hypothesis of an all-pervasive energetic field of quantum zero-point energy is the all-pervasive field, which Consciousness of the esoteric traditions talks about too.

However, all recent attempts basically retain the old tested approach of science, which wants to understand it from down-upwards causation. First one must understand this, and then reverse this approach; direct it towards an all-inclusive holistic one, an up-downwards causation. Implying thereby that the basic stuff of the universe to study is the physical energy, matter, even if it is terms of fundamental particles and their associated interrelationships. It has been a mistake of modern science to assume that ultimately reductionistic scientific causes are explanations of everything. It is not an adequate world-view, since it has resulted in gaining control through manipulation of the physical — and the psychological-cultural implications thereby — environment albeit within that context everything seems to work well. It leading to conflicts, confrontational dualities between science and religion, free will versus determinism, you versus me, and so on.

Of course, these foundational assumptions have been modified with the advent of quantum physics, particularly by the indeterminacy principle and the inherent statistical nature of measurement of the very small. Agreement is spreading among the few that science must develop the ability to look at things, particularly living things, more holistically. There is evidence that everything physical and mental that is experienced is part of an intercommunicating unity, a oneness, and there is no justification of the assumption of separateness. However, within specific contexts, isolating parts from the whole the ordinary concepts of scientific causation do also apply.

In other words, if we include both ways, inner and outer, into account then we know that one reality is to known in two ways that are not separate but interlinked. The epistemological issue involved is our encountering of reality limited to being aware of, and giving meaning to the messages from our physical senses (objective), or does it not also include a subjective aspect in an intuitive, aesthetic, spiritual, noetic and mystical sense? In any case, in normal science ethics and aesthetics (elegance) enters in various ways. In a restructuring of our view of science, of matter, inner explorers may be included. In doing so, science would be more inclusive and this is not to

invalidate any of the physical and biological sciences. One may thus be both distancing oneself and be also participatory, in being one with the subject.

The goal of the above discussion is to point out new directions of holistic science, of oneness — Consciousness — as the new foundations and metaphysics, then whole new vistas are open before us. Many anomalies, paranormal phenomena, will begin to fit in this framework, that does not insist on fitting everything into a reductionistic science and that we humans are here solely through random causes, in a meaningless universe; nor that our consciousness is merely the chemical and physical processes of the brain.

Few scientists are willing to question the philosophical issues underlying their work; that they are part of the underlying definition of science — say the objectivist, positivistic, determinist, and reductionist assumptions of logical empiricism. Not that these have not served science and technological development well, less so in biology even though the new gospel is molecular biology; but when the social scientist have aped these approaches it has been a disaster.

Most scientists would assert that science has moved away from all this for over half a century ago. But it is not clear, towards what; and consciousness has not come into the picture yet even though major paradoxes are facing science today, namely:

1. The fundamental nature of things does not appear to be convergent — more and more of fundamental particles are appearing — reductionism is in fact pointing to a wholeness, in their separation these are connected.
2. The fundamental organising force in living systems, from the largest to the smallest, is unexplained by physical principles (homeostasis; intricate flower patterns, butterfly wings, etc., healing, regeneration, ontogenesis, etc.)
3. The problem of action at a distance, or non-local causality, appearing in the far reaches of quantum physics; meaningful coincidences or connections, or Jungian Synchronicity — called paranormal, telepathic, clairvoyant communication; a host of others.
4. The knowledge of the universe is incomplete since there is no place for the consciousness of the observer, as if he is not in it; the notion of free will, volition and other characteristics of consciousness. Going from physiochemical to the consciousness does not work; it is the movement from higher, subtle, to the lower or gross which will take many of these aspects into account.
5. The notion of the self, the concept is not clear and not taken into account even though it is involved in the act of observation.
6. What are altered states of consciousness, which mystics and others know of, but are indicated in ordinary mundane lives also and are sought after by one and all — in aesthetic experience and so on? If atom, and

other splitting causes the release of unforeseen energy, the splitting of the ego releases another dimension of consciousness little known in everyday living in a sleep-dream like state.

Given the above puzzles, researchers are moving into new areas to understand matter and consciousness, unthinkable a couple of decades ago. It requires a restructuring of the approach towards a oneness picture, a wholeness science as some would like to call it. This is to say one experiences the world from inside as consciousness, which is the whole also since the outside experienced by the senses is its external manifestation. Evolutionary speaking, evolution is the manifestation of consciousness, not just a single track of separate evolution from times immemorial. Consciousness, thus becomes an agency, in the relevant data which we desire to create for our images and pictures of reality.

This approach thus implies a sensitisation of the observer, whereby he/she is altered and is willing to be transformed in an ongoing dialogue — with whatever — which is the essence of creation and not any rigid stand of authority, expertise that leads to entropy. This transformation happens, if it is true for the anthropologist, psychotherapist and so it would be true for the scientist who wishes to study meditation and altered states of consciousness. Maybe the movement is up and down, like an hour glass or a spiral. This process of conscious awareness, involves unconscious processes, volition and the concept of the self and so on. In scale, depending on the level — where one is placed — that matter becomes consciousness and consciousness, matter. It all is real or unreal — whatever suits one's terminology.

Naturally, in the new approach (e.g., not that bodies have consciousness, but consciousness has bodies) the questions asked will radically change; how does separateness arise, if all is one; does the brain act as a filtering and reductive mechanism? No longer will one ask questions of how to integrate the universe but how does it feel separate; how to explain the interconnections — not through linear processes of the big-bang; of seeking a unified theory involving many different fields (gravitational, electromagnetic, morphogenetic, string theory, etc.) the various energies. Once, following Einstein who took light's velocity to be basic, consciousness becomes the base line and different explanations will follow — a quantum jump ! It will serve us well in individual and societal development as well. Openness to alternative theories in this scheme, explanations and healthy scepticism remains a part and parcel of it. In brief, the new approach of research scientific endeavours include both direct experience of the inner senses and the outer physical ones as a unity of consciousness; and is not based on any principle of exclusion of any human experience.



In short, the view of this paper has been to emphasise the fact that there is an urgent need to change the basic paradigm globally from a mechanistic one to holistic one in the physio-psychic realm. The split-dualistic is built into the very texture of the scientific study of matter, of thought, in all walks of life. Its limitations have to be seen in order that a unified mode is available as has been shown by particle physics, extra-galactic cosmology, through post-Einsteinian physics, and by Heisenberg and others — in the dissolution of solid matter into waves of probability. The shift indicates that Consciousness is not an epi-phenomenon of matter but the very matrix and the Context of all contexts within which everything functions, i.e., it is the way of perception itself.

When one considers the brain-body system separate from the external circumstances, then it is the old approach to considering oneself outside the picture, a mere observer. The mental setup is made up of the socio-cultural world and the individual personality is not a free independent unit with its own will to play as it wishes; this is the belief one works in the world to solve any crisis. It is like repairing a motor vehicle which is constantly involved in accidents without taking into account the fact that the driver is constantly drunk and that is where the problem ought to be looked into. If one leaves the brain-body system out of reckoning in this attempt to rectify matters, then the most important variable is left out. But one plods along as if the individual, this unit, the brain is all right and all one has to do is to cure the socio-economic conditions for the utopia to come into existence.

Now, the organism, the body-brain mechanism itself, is being hard put to understand all these goings on; it is struggling to know this state of affairs of utter conflict and contradiction since in its very depth of being it knows it is made up of all the elements of the universe. It is in fact in all of its activities trying to relate and communicate by its surroundings, the environment. But this conditioning is so deep rooted, as a separate self, as an identity that obviously it causes agony and alienation as well since it seems to give an empty feeling about one's identity. This so-called separate self unconsciously cannot really discover any solid, stable 'me' or an answer to , who am I? In normal life, all one does is to play the various social roles that are based on a reaction-reaction system within the relatedness to the other functionally given. Without the other, there is no separate identity even at the social level.

Nevertheless, since the conditioning is so strong, the brain struggles to search for its real identity and not finding one in what it has learnt within that limited dimension, it is thoroughly exasperated; it goes *berserk* despite trying to maintain some semblance to sanity, it becomes frantic, and it is in despair and totally alienated both within and without. One may ask, since the separate self has always been there, why is the turmoil so great today? Earlier, perhaps by and large individuals functioned within certain stable social setups that were not governed by rapid changes and one's position in society was relatively

secure in terms of who's who and what was one's position. This gave a certain kind of stability within the given world-views which were accepted as one's context of existence in the universe. The same has no longer been true, with the beginning of the modern era in the seventeenth century and the rapid growth of industrialization, urbanization and the philosophy of cross consumerism that has become the global way of life, barring some minor exceptions. All socio-cultural boundaries have been eroded, quickly and there is no certitude even in any world-views, unless it is a reversion to fundamentalism as a last ditch battle. The brain has no time to adjust to changes occurring externally in walks of life, not excluding the environmental changes. A new order based on intrinsic equality is a long way off, just like is the case in terms of socio-political and economic equality. The different parts are not co-ordinated, especially psychologically since thought itself is based, as yet, on hierarchy and domination and subordination principles.

Thus nothing is clear even externally, in this age of transition when even the views of the cosmos are far from clear and the old ones no longer provide any adequate answers. Perhaps, these are phase-changes, like what Prigogine (Artigiani:1990) speaks of the time of dissipative structures. One can imagine the state of affairs in the brain, given the enormity of the problem briefly stated above. This is the uncertainty, and the cause of violence, upheavals since every aspects of life is destabilised into several contending problems, their solutions, theories, etc. But the more weight one gives to creating artificial identities, old or new formulations, these are still not one's natural or spontaneous creations. These formulations are made more out of a sense of insecurity, clinging to a so-called reinterpreted past. These are reactive attempts which do not create security since it is a reaction to the others who also are against it as mutually dependent enemies.

The inner psyche is still looking for 'who am I?', who one is, and no amount of external solutions, in the absence of the overarching umbrella of Consciousness, will bring about any lasting peace or contentment. The organism somehow knows its true nature, or at least that what is given is not so. But in the present trance-like conditioning one continues to grope in the hope of 'tomorrow and tomorrow' little realising that mirages continuously recede and will never materialise. The first signs of the awakening of Consciousness is to be aware of this false image, the false changes, this hope against hope, this untruth. This is the first step towards a new dimension which without being stated may bring about the 18010 degrees transformation that is so imperative in bringing about the shift in Global Consciousness in all walks of life.

*Om*  
*That is Whole*  
*This is the Whole*  
*From Wholeness emerges Wholeness*

*Wholeness coming from Wholeness  
Wholeness still remains.*

## Notes

Page | 35

1. The richest and most fundamental of all complementarities is of course that of matter and Consciousness (mind). Perhaps, Wolfgang Pauli (of the Pauli Exclusion Principle) has stated the matter most clearly and succinctly. "To us . . . the only acceptable point of view appears to be one that recognized both sides of reality — the quantitative and the qualitative, the physical and the psychical — as compatible with each other, and can embrace them simultaneously . . . . It would be most satisfactory of all if physis and psyche (i.e., matter and mind) could be seen as complementary aspects of reality."(1955; pp.208-10); quoted by Kothari (1986).

2. The quest for unity has taken on new poignancy in recent years, as the unstoppable sledgehammer of specialization pounds the world into smaller and smaller pieces and as humankind grows more estranged from nature. For example, the Gaia hypothesis, which proposes that the Earth is a single organism, has attracted a devout following far beyond the scientific community. Introduced in its modern version by James Lovelock (1979; 1988), who claims that the earth's atmosphere, oceans, climate, land, and living creatures are part of a giant feedback loop, which attempts to maintain conditions suitable for life (Myers: 1985).

Timothy Ferris (1991) is concerned with cosmic unity since he believes that our true connectedness lies far beyond Earth, with the cosmos. Ferris envisions our relationship to the universe as hour-glass shaped. On the bottom side is the inner realm of the mind; on the top is the outer realm of animals, stars, galaxies. His work encompasses brain studies, astronomy, physics, mysticism, the "near death experience", environmentalism, information theory and so on, all in the context of mind's search for unity and cosmic connection.

3. Does unity have a reality beyond its conception? Is it that the mind must impose unity on the inner world of itself? Could the same be true of the outer world beyond the mind? Could the unity scientists seek exist mainly in their minds? Perhaps, the unity of science consists alone in its method, not its material, as it is not the facts themselves which form science, but the method in which they are dealt with. Order, and reason, beauty and benevolence are characteristics and conceptions which we find solely associated with the mind of man, wrote Karl Pearson (1892), the founder of twentieth-century statistics, in his influential book, *The Grammar of Science*. This is much the same as Einstein said in the journal of Science(1940), "Science is the attempt to make the chaotic diversity of our sense experience correspond to a logically uniform system of thought" (Ferris, *Ibid.*).

4. The theory of quantum physics was worked out in the first three decades of the century by Max Planck, Werner Heisenberg, Erwin Schroedinger and Louis de Broglie, and that theory has been confirmed with great precision by many experiments, including the double-slit one. But no one understands the meaning of quantum physics. If it has not made the new man of science jump from his chair, it has certainly made him wonder what he was sitting on! We have learned that there is no clear line between the observer and the observed. We are connected to nature. We are part of a whole. The physicist John Archibald Wheeler calls the world as we now understand it as a "participatory universe"; i.e., that we shape the properties of the universe by our very observation of it. Not long ago, such a notion would have been dismissed out of hand by every *bona fide* scientist and many philosophers. We are not mere bystanders who probe electrons to see how they move, or who record the level of carbon dioxide in the air, or who build radio receivers to point up instead of sideways. We are part of it (Ferris, *Ibid.*).

5. Another message is that science is done by individuals who bring with them, and are influenced by beliefs. Chance events can lead to predictable outcomes. For example, the decay of a single radioactive atom is the paradigm of randomness, but the behaviour of a large lump of radioactive material can be accurately predicted. Hence, the contingency of evolution does not depend merely on the random nature of genetic mutation. It arises because mutations have qualitative different effects, and because these effects can be amplified. This amplification of quantum events, combined with the unpredictability of the environment, makes it impossible to foretell the long-term future, although it may still be possible to explain evolution in retrospect. There is no stately Victorian notion of inevitable progress toward the Omega point. Empirically, individual lineages do not necessarily progress: they are as likely to lead to tapeworms, or to nothing at all, as to lead to man. There is no such thing as global progress; only a tendency to get better and better at whatever you happen to be doing, i.e., increasing information transmitted from generation to generation — from RNA molecules duplicating themselves to social animals and animals with language (Mayr: 1990).

6. Cassidy (1990) writes that at the age of 23, in 1925, Heisenberg laid the foundations of quantum mechanics on which all subsequent generations have built. It abandoned the basic notions of the old classic physics, such as that of electrons moving in orbits, replacing them by a much more abstract description. It is true that a year later Erwin Schroedinger published his theory of wave mechanics, which turned out to be identical in content to Heisenberg's quantum mechanics. But we needed both points of view to develop a real understanding of the physical world.

The Bohm-Sommerfield theory, accepted before Heisenberg's paper, described electrons in the atom as revolving around the nucleus in orbits, like planets around the sun, as in classical mechanics, but only certain selected orbits were

allowed. Radiation was emitted when an electron jumped from one orbit to another, and the energy loss of the electron determined the frequency (colour) of the radiation. Heisenberg discarded the concept of orbits which not in principle be observed, this was made more precise later through his uncertainty principle, and he proposed that the physicist should only deal with observable things. This meant concentrating not on single orbits, but on the emitted radiation, which comes from a jump between two orbits, so that talks of two states of the atom at a time.

Schrodinger's wave mechanics started from a very different approach, but it also gave correct results and appeared at first to be an alternative theory. It soon proved to be the same as Heisenberg's, although expressed in a different language. After a heated discussion the correct view was expressed by Max Born that the intensity of the waves determines the probability with which the electron will be found at a given point in space. Thus physics cannot specify the position of a particle; its position is a matter of chance, with only probabilities being the subject of the physicist's description. This conclusion led Heisenberg to his "uncertainty principle", which has to do with the accuracy with which different attributes of a physical object can be known; the more precisely we want to know the position of a particle, the more uncertain must be its velocity, because the act of observation causes an unknown change in the velocity. (Gandhi: 1990).

7. Science has undergone radical revolutionary changes in its connections not only of nature but also of its own workings. It has come a long way not only from a Newtonian universe, left far behind, but even in terms of Relativity and Quantum theory with the development of "Copenhagen Interpretation". For example: 1. Planck's constant "now renders description of nature inherently stochastic". 2. Heisenberg's principle of Indeterminacy shows the impossibility of a full and complete mnemonic picture of nature". A combination of both these produces a radically new epistemology in which the scientist participates unavoidably in the picture of nature that he produces. 3. Neils Bohr's Principle of Complementarity recognizes the fundamental complexity of nature, "Forever repudiating any monolithic reduction of nature to a single level of reality describable in a single language. At the same time, application of these ideas to chemistry and biology have revealed the importance of non-material realities, like order and structure".

In short, all these new areas in science, or a new science, talks of randomness rather determinism, complexity replaces simplicity, mind replaces matter, and aesthetic principles replace mechanical impacts. If the old goals of sciences were antithetical to the humanities or for predicting human behaviour, the new scientific "cannons respect the same values as do the humanities, while its descriptive laws may make possible an organizational paradigm that will allow history to rise to significant levels of theoretical generalities". 4. One such example is Ilya Prigogine's thermodynamics, wherein he talks of 'dissipative

structures', open systems far from any equilibrium states, as earlier thought. Such a model may apply to the study of history and civilizations. Prigogine argues that dissipative structure's model the process by which matter organises itself into higher and more complex systems. The self-organization of matter, "explains the origin and evolution of living forms and also the emergence and development of the systems in which living forms are organised. The latter is said to include the course of development of eco-systems and even civilizations. The potential of Prigogine's thermodynamics for historian is immense. A science that could track the development of civilization would give us a model for the organization of our data, a way to extract meaning from the cacophony of events, and a device for explaining history". (Artigiani: 1990).

Science has been governed by Newtonian systems and Gallileo's knowledge, i.e., gathering facts to make it a whole which rested on a timeless idealization. It posited a nature made up entirely of matter and forces, forces which act on matter but do not change it, i.e., it is a static concept that does not allow nature to other qualitatively, not dynamic. In other words it was a mechanical model (as followed in history and social sciences) of nature that is indifferent to time, where potential and kinetic energy is constant so that any strictly mechanical alteration is wholly reversible. Thus Newtonian forces leave dead matter substantially the same although the positions may have changed. Newtonian sciences cannot explain the existence of scientists who create it!

Irreversibility is the key to Prigogine's revolution. If nature is irreversible then it is not indifferent to time. Time is a fundamental part of nature, not just a device for measuring nature. This means that with time built into it, a historical nature would be one in which new forms of existence could develop as a result of concrete experiences. These new forms in turn, could constitute wholly new levels of phenomena, dependent in their antecedents but not reducible to them. Dynamics would then become profound, for movement would result in qualitative change leading to increased complexity and new laws of behaviour. This like a science of systematics theory, for it would be the very evolution of a structure over time through experiences that defined the structure. The structure would be self-referential, like a work of art. Science thus absorbs the epistemology of history, for it describes nature existentially as the narrative sum of its experiences. This, in short, is Prigogine's science, rejecting monolithic idealization of nature, but embracing Bohr's Complementarity and develops different languages to describe nature in its several stages.(Aritgiani: *Ibid.*).

Dissipative structures are often thus systems exchanging matter and energy with its environment. " Because it can draw upon environmental resources it can maintain its internal order even though that order is far from equilibrium, therefore it is open to variations in environmental inputs, a dissipative structures is always vulnerable to evolutionary developments . . . .Thus structures follow function and is dependent on environmental fluctuations". In

summary, dissipative structures combines freedom with order, stability with change, internal with external factors. Its self-consciously Aristotelian character describes a nature in which dynamics is significant, for now nature not only moves, it changes. Change, growth, and development are now fundamental to nature, like time. But change takes place through a process of evolution punctuated by non-linear departures occurring when a system is driven through a stage of complexity which exceeds its organizational capacities. Further, this leads to bifurcation points — catastrophes endured — continuity and discontinuity, order and transition succeed each other in ways which can never be predicted. All structures are the result of wholly random occurrences, but structures once in existence are far from a state of equilibrium, these can govern their internal behaviour and thereby sustain themselves. All these laws could be applicable to the study of history and social sciences. Prigogine's science is what matter thinks about itself, once matter gets complex enough to think, in the sense what history has not done in the very narration of it!

Prigogine's Bernard instability, of replication, all at the molecular level, all this suggests that the emergence of civilization, like a phase change, is wholly unpredictable event caused by free and creative people as they react to environmental factors. In other words, suggesting that a new civilizational structure would demand greater environmental resources than the simpler organization preceding it. In open systems many variables are involved; in this way boundary-structures being defined by the system itself and thus be defined into higher forms or be crystallised. Details of such aspects will have to be worked out in details. It is therefore a mind-effected, mind-affected world — a snake eating its tail symbol. In many in which mind transforms matter, leaving behind a template that reconstructs the creating mind in any succeeding intelligence encountering it. Works of art are obvious examples of how artist effects his work, the media; the latter effecting the artist too and the viewer as well. One could say in a similar way how technology has effected humankind albeit it was created by it, e.g., cars taking over man's organisation.

In this way a physical record of historical experience survives to program future actions, in a manner quite like the DNA molecule which is also a system of organisation. In humanity's case, its capacity to record and communicate experience symbolically that most affects behaviour. Recent social theorists have developed the idea of a cognitive map to explain the process by which environments and experience are encoded to orient behaviour. The cognitive map is a set of symbols held in the mind that represents the environment and preserves the record of ancestral experiences to deal with environmental challenges, i.e., a data bank and programme constituting the cultural complex relating to one another and their world. The maps are meant to match the environment, and like a thermostat maintains homeostasis; often the map is clumsy and seldom recognized and aware of it, i.e., people are unconscious of

it, of how to use it and read it. It is only when systems of values in it are most important like the hexagons of Bernard's instability, then only transformations become possible, i.e., when knowledge and experience fuse into values they undergo phase change. If this does not happen, civilization is unable to match internal changes, and environmental changes, then do enter catastrophe phases. Being conscious of these, one can play the game or be overcome by reactions and chain of events including ways of explaining one's self. There is no meaning of history; there is meaning in history, the meaning people give to their own experiences when they map and thereby order it, i.e., it is not deterministic but self-referential, in order to test their validity. This, in order to create non-linear departures or psychologically quantum jumps which this civilization requires at this crucial juncture both historically and in terms of evolutionary goals. It may be done by self-organization, self-definition, re-definition of cultural values that are not antithetical to nature. This would bring about the necessary radical revolution so necessary for humankind today (Aritgiani: 1990).

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