

Article

Physics & Cosmic Order I: A New Prospectus, an Ancient Theme

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ABSTRACT

A review of historical theories about the nature of phenomenal experience reveals a pattern that shifted, in the west, toward an externalized causal view in linear time, with Aristotle's rejection of Plato's Theory of Forms. This introduced a bottom up approach that focused on particulars distinct from the predominately top down approach of Plato and the pre-Socratic philosophers that regarded universals as primary. When modern science began it was suited to Aristotle's view of local causal influences in an assumed context of space and time. In the twentieth century quantum and relativity theories have developed as often contradictory solutions to universals that keep intruding into the landscape. A new methodology that bridges universal and particulars complements traditional approaches to science and offers a coherent assimilation of the empirical evidence. The result is a synchronous *quantum relativity* integrating universal and particular elements of phenomena at all levels of experience from the atom to the cosmos—a new view of the *cosmic order*. In the process a new class of *quantum forces* becomes apparent that integrates history by maintaining a preponderance of synchronicity in the primary projection of matter on a cosmic scale. This timeless universe addresses many questions associated with the quantum of action, light transmission, relative motion, missing mass, gravitation, electromagnetism, red shift, background radiation, quasars, and other phenomena. This universal methodology for the sciences is the picture on the cover of box that can guide the assimilation of the jigsaw pieces of empirical evidence into a coherent living whole.

Key Words: Cosmic Order, physics, new prospectus, history of thought, Vedas, ancient Egypt, Plato, Theory of Forms, Aristotle, universal and particular, Newton, Einstein, de Broglie.

In the last few generations we have been encouraged to take smug satisfaction in the frantic pace of our scientific achievements. There is little need to elaborate. From the first motor car to the moon in a living memory! From the first feeble wireless to global satellite communication! We are probing the heavens, the atom, and the mind to the very frontiers of creation itself, at least so we tell ourselves.

If we step back for a broader view of the canvas, however, a strangely inconsistent perspective emerges. Different patches of the landscape clash grotesquely. Some gaping holes have been left untouched, some remain in a state of confusion. Other scenes have been painted over so many times that the history of development has been lost under layer upon layer going back to antiquity. From our involvement close up we are prone to believe that the incongruities can be glossed over in the

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modern idiom, a grand unified view emerging in triumph, once and for all. Praise be to man! Is science becoming a religion? Or can the one exist without the other?

Our myopic fixation obscures a fundamental reality. Our collective knowledge, however immense, is utterly dependent upon a few fragile principles of understanding, very tenuously rooted in our cultural ancestry, and in good measure lost in the misty dawn of recorded history. Moreover, our capacity to alter, develop, create, or discover such underlying precepts is extremely limited. They change only with the tide of history, for they determine the plot as the human story evolves.

These precepts concern the structure of phenomenal experience itself—the *cosmic order*. Our power to cope with experience derives from them, to the extent that they are consistent with the cosmic order. But the cosmic order cannot be deduced through logic or reason, for these qualities themselves depend upon it. The organization of the human nervous system must reflect the organization of phenomena in general if our responses are to be appropriate to circumstance.

Glimpses of the cosmic order are revealed by experience itself through insight into its nature. Logic and reason follow on a leash of language to fill out the story accordingly. It is a ponderous path that we tread through time, for the steps that we take span millennia.

We are accustomed to think that the roots of western philosophy, science and mathematics lie nourished in the golden age of Greece. While this may be a milestone in the story, the Greeks in turn found inspiration in cultural developments that had bloomed over two thousand years prior.

The Indus Valley, Mesopotamia, and Egypt were linked by the Persian Empire to the shores of Greece in the mid sixth century BC, bringing these influences into focus.¹ Early Greek thought was very much in accord with earlier “top down”² insights into the cosmic order and related questions that had already been entertained elsewhere for centuries.³

Plato’s *Theory of Forms*,⁴ for example, generally centered around the relationships of universals to particular manifestations of them, as in the case where the leaves in the forest are all representatives of a transcendental thing known as an archetypal leaf. We see here the familiar “unity in diversity” theme that pervades so much of Vedic thought, the universal and particular aspect of things being perceived as mutually interdependent.⁵

¹ West ML. *Early Greek Philosophy and the Orient*. Oxford: Clarendon Press, 1971.

² McDaniel CN, Gowdy CN. *Paradise for Sale: A Parable of Nature*. Berkeley: U of California Press, 2000:16-17

³ Lomperis TJ. *Hindu Influence on Greek Philosophy*. Calcutta: Minerva Associates, 1984.

⁴ Ryle G. Plato. In: Edwards P, ed. *The Encyclopedia of Philosophy*: Vol. 7, p. 321 London: Macmillan, 1967.

⁵ Gilbert Ryle, then Waynflete Professor of Metaphysical Philosophy at Oxford, reports that Plato’s elenctic dialogues were abruptly terminated with the *Gorgias* or the unfinished *Thrasymachus*, with a drastic change of direction. Whatever crisis this may have entailed, succeeding dialogues are almost devoid of his previous argumentative checkmating, and concentrate on presenting constructive philosophical doctrines, the *Theory of Forms* being the most famous by far. The theory is treated in the *Symposium*, the *Phaedo*, the *Republic* and the *Timaeus*, and it comes up again in the *Philibus*, the *Sophist*, and the *Parmenides*. Of thirteen letters reputedly written by Plato, there are four which are accepted as authentic by most scholars, including Letter VII, which is a piece of Plato’s autobiography. This letter also contains an excursus on the *Theory of Forms*, and if authentic, shows that Plato held to this theory at least until his mid-seventies.

There are anomalies in the pattern of course, even where connections between Greece and India seem obvious. For instance early non-Vedic Indian materialism, in rejecting that nature reveals any transcendental power working behind it, declared: “*Fire is hot; water, cold; and the air is temperate to the touch. Who could have brought such distinctions into being, if they were not of the very essence of those objects.*”

Although Aristotle was not a materialist in the same sense, this view is strikingly similar to his position that the essence is what a thing is by its very nature, what gives it its identity, thus identifying the essence with substance.

Yet Aristotle didn't extend his position to embrace atomic theory as proposed by Leucippus and Democritus in the late fifth century BC, a development that was similar to the appearance of atomism in both the Vedic and non-Vedic systems of India. The Nyaya-Vaisesika, for example, postulates indivisible and super-sensuous particles as the ultimate cause of all the material products found in the universe.⁶

In 325 BC, the Persian Empire fell to Alexander the Great, an event that signaled a turn in the tide of history. Alexander's teacher, Aristotle, was instrumental in reformulating Greek thought and the shape of things to come. He set aside the vagaries of mystical insight into the creative order in favor of deduced conclusions based on assumptions about the nature of phenomena. He granted objective analysis ascendancy over intuitive insight. Through his treatment of syllogistic argument, experience became externalized, although this momentous step was to take more than two thousand years to mature. By identifying essence with the concrete individual object, Aristotle atomized the universe more surely and permanently than Democritus ever could have done, although it is unlikely that he intended the course that ensued. His nexus of four causes, operative through an assumed linear flow of time, completed a general framework for linking up an atomized universe in its all pervasive vessel of space. Together with subsequent and consistent contributions from Euclid of Alexandria, Archimedes of Syracuse, and Apollonius of Perga, the door was closed on the sacred geometries that had preceded them for two thousand years. The plot for events far in the future was outlined in their place. This is not to reduce Aristotle's contribution to this framework alone, for this was not his conscious intention and the breadth of his work is well known.⁷

In the East, a causal principle had long since become firmly established, however it bears little resemblance to causality as it developed in the west. The law of *karma*, as a causal principle, derived from the cosmic order. The latter was first expressed as the *rta* very early in the Vedic period, later reappearing as the *dharmā*.⁸ A distinguishing characteristic of the law of *karma* is that it is operative in a way that both transcends and subsumes events in the whole of space and time, and yet is related to them also. It is not operative through linear connections in an assumed flow of time. It is cyclic. It concerns a transcendent reality that is manifest in the cosmic order as the interdependence between the universal and particular aspects of being. The cosmic order was known with equal clarity as *maat* in ancient Egypt and as such it was essential to all value judgments. *Maat* was in fact represented as the fulcrum of the balance that weighed the human heart against the feather of *maat* in the Hall of

⁶ Hiriyanna M. *Outlines of Indian Philosophy*. Delhi: Motilal Banarsidass, 2000

⁷ Barnes I. *Roman Aristotle*. In: Nagy G, ed. *Greek Literature*. London: Routledge, 2001; 8:174-240.

⁸ Hiriyana M. *Essentials of Indian Philosophy*. London: Unwin Paperbacks, 1978:13.

Two Truths.⁹ The cosmic order, being both immanent and transcendent, thus constituted the basis of the final judgment of the dead before the resurrected Osiris.

In the west, the Romans transported the essentials of the plot throughout Europe, where the ideas incubated in the western mind for more than a thousand years. Aristotelian thought, with all its divergences from the work of Aristotle, gained a firm footing, alongside Plato's perennial influence. With the coming of the renaissance, many of the works ascribed to Aristotle and misplaced for centuries, were reintroduced from Arabic sources in the twelfth and thirteenth centuries. While this may have served as much to muddy the waters as to clarify them, it did refocus attention on the issues underlying the development of the western plot.

Events had only to wait for Galileo, Copernicus, Kepler, Descartes, then Newton, first to determine empirical relationships, then to formalize into explicit laws the precepts that already rested comfortably in the bed of western culture.¹⁰ Modern science was born after a very long gestation period. And if Aristotle did not completely discard the spiritual inclinations of his teacher Plato, his modern descendants have surely done their best to lay them to rest forever.

Nevertheless, there are many enigmas in the story. For instance, Newton's interest in physics waned in his fifties when he began to devote much of his time to theological pursuits, including an intense interest in the Hermetic tradition. From our current cynicism, one might be inclined to dismiss this in association with a reported nervous breakdown. However his interest in the magical realm of alchemy had influenced his thought in his younger days when he was developing the theories to which we are so indebted, and which appear altogether antithetical.

It is a very long way from the cosmic order, known to the ancients as the *rta* and *maat*, to the physical mechanistic world that Newton unwittingly launched in full fury. The former was an intrinsically moral order. The latter is lacking in human values whatever. Anthropomorphism became seen as a violation of Aristotelian identity, there being no underlying unity implicit in the diversity of phenomena. All things are objective isolates and man is the law maker charged with the need to bind them together with causal chains. But men have not been the conscious authors of the plot. It seems that for some reason, during this period, in this remote workshop of the universe, a job has simply needed doing.

It took two centuries for Newtonian physics to stretch to the point where holes began to appear in the fabric. Universals began creeping out from under the Aristotelian carpet and new and better brooms were needed. It is true that universal gravitation had finally been accepted over protests about action at a distance, but one universal is tolerable if a broom may one day be found to manage it. However

⁹ Campbell J. *The Masks of God: Oriental Mythology*. London: Penguin 1976. The two accounts of the creative acts of the sun-god *Atum*, of the ancient city of Heliopolis, both from the *Pyramid Texts* inscribed on the walls of nine tombs (c. 2350 to 2175 BC.) in the necropolis of Memphis at Saqqara are lacking in psychological depth. They describe the creation of the divine *Ennead* which includes the husband/wife pairs *Osiris/Isis* and *Seth/Nephthys*. However a stone, Stela no. 797 in the British Museum, its message dating from the beginning of the Old Kingdom (c. 2850 BC.), makes *Atum* and his *Ennead* the mere agents of an antecedent spiritual force, the supreme deity *Ptah*. *Ptah* was thus understood by the priesthood as both immanent and transcendent, but also to function through *maat*, the goddess representing the cosmic order.

¹⁰ Koestler A. *The Sleepwalkers; A History of Man's Changing Vision of the Universe*. London: Penguin, 1989.

others began creeping out, unsightly things, and embarrassing. Electromagnetic forces began acting at a distance all over the place. Faraday, being unburdened by a higher education, introduced the idea of the field as a carrier between bodies.¹¹ Then Maxwell exploited the field to incorporate light as an electromagnetic phenomenon with wave characteristics.¹² It was a neat solution for electromagnetism, but then, alas, the speed of light turned out to be universally constant. In the name of Zeus why?

Fortunately Einstein proved to be a pretty good broom maker. Impressed with Maxwell's success, he turned the whole of space and time into a field,¹³ and in the process turned another ugly pariah into a boon. It was a brilliant solution. The intermediary field curved to finally bridge gravitational action at a distance. But is acceleration through space and time really the same as gravity? Can they be judged equivalent solely on their apparent subjective effect? Could there be another explanation?

In the meantime Planck had pulled another universal out of black body radiation, like a rabbit out of a hat.¹⁴ This was a monster of such proportions that the normally sober minded establishment was reluctant to look it in the face. Why in the name of Zeus should the entire electromagnetic spectrum be quantized? It is a continuous spectrum. Why should radiation come like a series of discrete pulses according to a universal quantum of action? Planck was disturbed by his magic too, called it an act of desperation.¹⁵

Then Louis de Broglie came along with his quantization of matter, in waves no less, according to the same universal quantum of action. The idea came to him as an intuition that matter was like a little clock in motion. He was "greatly smitten" by the fact that the transformation formula for a wave, in special relativity, is the reciprocal of that for the frequency of a clock.¹⁶ Aristotle would have been smitten as well. How is it that the internal frequency of a thing translates as the reciprocal of its external appearance? Where does this place Aristotle's identity of essence with substance? And what about cause and effect? Not only has matter become both wave and particle, but one can't be sure about both position and momentum. And how does an electron jump from one atomic orbit to another without traversing the space between?

This was a nasty set of horrors indeed, and the best that could be done was to speculate with chagrin on the probable outcome. But does one allow a place of honor to the laws of roulette in the hallowed halls of science? Can a group of men of the Copenhagen School decide for us all that we exist as probability waves? De Broglie didn't like it. Neither did Einstein, and no doubt a good many others lost some sleep, or flinched in their graves. We are talking about the stuff of our bodies. But that is only an anthropomorphic concern. There are no universal aspects implicit in the particular aspects of being. Or are there? The quarks, of course, are another Part in the story.

¹¹ Faraday M. *Experimental Researches in Electricity: Series 15-18*, Philosophical transactions, 1838-1843. Harvard, 1844

¹² Maxwell JC. *On Faraday's Lines of Force (1856); On Physical Lines of Force (1861); A Dynamical Theory of the Electromagnetic Field (1864)*, in Niven WD, Ed., *Scientific Papers*, Vol. 1, Cambridge, 1890

¹³ Einstein A. *On the Generalized Theory of Gravitation*. *Scientific American*, April, 1950.

¹⁴ Planck M. *Eight Lectures on Theoretical Physics*. Columbia University Press, NY, 1915.

¹⁵ Heilbron JL. *The dilemmas of an upright man: Max Planck and the fortunes of German science*. Cambridge: Harvard U Press, 2000:8.

¹⁶ De Broglie L. *In Wave Mechanics, The First Fifty Years*. London: Butterworths, 1975.

Although Heisenberg might have liked to discard the idea of particulate matter altogether, his uncertainty principle deals, among other things, with the problem of being unable to accurately know both the position and momentum of a particle at the same time.¹⁷ This uncertainty, it is claimed, is a function of $h/2\pi$, as if Planck's constant, h , is the circumference of a circle, or a cycle of time generated by energy, and the uncertainty is roughly the radius or amplitude.

A universal cycle of time? What is that? Although the connotation is obvious, there is a taboo against expressing it as such. It would shatter the whole concept of space-time as a continuous field and Einstein's best broom would lie broken. Big bang cosmology would undergo gravitational collapse, unable to sustain that everything has evolved through local influences from a singular event, at some incredible time when the entire universe was unimaginably smaller than a single proton. Not even the discovery of mountains of dark matter could hold it up. Those nasty universals keep getting in the way, in spite of our wildest inventions.

At this point we may leave the historical tale incomplete, for it is not intended as an exhaustive account, nor is it intended to treat our difficult and faltering steps lightly. Our progress through the ages has been earned through enormous commitment, no less for the pyramid builders than for the great numbers of scientists working today. This brief review is intended to emphasize a very fundamental theme in the drama that dates back at least five thousand years.^{18, 19} The cosmic order is very much a matter of the mutual interdependence of both the universal and particular aspects of experience.²⁰ Neither can be known to the exclusion of the other, for they are mutually defined by their mutual relationship. This is a profoundly fundamental relativity principle.

It was twenty-three centuries from the pyramid of Zoser, at Saqqara, to Alexander's conquest, twenty-three centuries ago. It seems that we are due for another turn in the tide of history, for we have exhausted the precepts underlying the development of science since the time of Aristotle. Although they have allowed us to accumulate immense knowledge, they are no longer adequate to cope with the ominous social and environmental circumstances that face us. The kind of physical mechanisms that we have grown accustomed to think in terms of simply do not allow us to take the first step in understanding the organization of living processes. We now stand thwarted by the very precepts that allowed us to reach for the moon.

There has been great resistance to allowing universals into the realm of science, perhaps partly because of religious overtones and the fear that we will regress into another dark age of oppressive dogma. But science can only avoid considering this alternative at the risk of becoming an oppressive religion itself, every bit as mindless as a pack of witch hunting saints gone mad. There is a middle road, where new insights into the cosmic order can offer solutions to the enigmas that face us, in a manner fully consistent with the factual evidence, and in a creative and constructive way. If the cosmic order turns out to be an intelligent order in the process, that should be no reason to recoil, for we will have gained further posts by which to better understand how intelligence works.

¹⁷ Cassidy DC. *Uncertainty: the Life and Science of Werner Heisenberg*. New York: Freeman HW, 1991.

¹⁸ Mahadevan TMP. *Upaniṣads*. Bangalore: Motilal Banarsidass, 2000

¹⁹ Breasted JH. Philosophy of a memphite priest. In: *The Monist* 1903; 8:2. Chicago: The Open Court

²⁰ Russell B. On the Relation of Universals and Particulars. *PAS:New Series*, Vol XII, p.1-24, 1912

Opportunities are provided by circumstance. Only recently has sufficient evidence accumulated to allow us to make a comprehensive attempt at formulating a more fundamental set of precepts more closely attuned with the cosmic order. Key pieces of the puzzle, presented above, suggest a scenario very different from the one that we presently imagine to reflect reality. The main points can be summarized as follows:

1) Planck's constant clearly points to two alternate modes for what we perceive as the material content of the universe. The one mode is fixed as particulate atomic matter and is specifically determined in spatially complete form. The alternate mode, although quantized as bundles of energy that correspond to particulate matter, is non-specific and cannot be spatially identified. This requires that the material content of the universe is involved in a very rapid and universally synchronous oscillation between the two modes. One mode is spatially complete with electromagnetic phenomena the only activity. The other mode is spatially indeterminate and timeless. This requires that events are prescribed by sequential still frames in a holographic movie of cosmic proportions. The spatially complete still frames will be called *space frames*. The timeless spatially indeterminate frames will be called *quantum frames*.

2) What we know as the wave character of matter is associated with the synchronous oscillation back and forth between the two modes. This means that the entire universe is vanishing and recurring very rapidly with and before our eyes, the continuity of events being provided by quantum jumps in position from one space frame to the next, through the agency of the timeless and boundless quantum frames. This is analogous to an ordinary movie where the blank screen facilitates the projection of successive frames to lend the illusion of continuous action. The blank screen in this case is the spatially and temporally indeterminate quantum frames that are integrated as a boundless orthogonal field that is called the Void. The Void allows an ever changing assimilation and configuration of particulate matter in a series of space frames. There is thus a dynamic identity between spatial form and quantized energy as non-specific emptiness, the Void. The Void acts as a *master sensorium* or memory bank. It is a repository of experience from which space frames are synchronously recalled. Because experience is in reflux and renewal, the sensorium also spans and integrates history. It regulates non-synchronous elements that arise due to relative motions.

3) The quantization of the electromagnetic spectrum, as it projects through space, is a universal measure of this fundamental oscillating action, hence Planck's relation $E=hf$. The quantization of energy, E , is a function of the frequency, f , because the universal action, h , is synchronous for all frequencies. The electromagnetic spectrum is being interrupted across its entire breadth by the successive disappearance and recurrence of space frames, thus requiring light to project as a series of discrete pulses.

4) The speed of light as measured in vacuum is universally constant because the recurrence of atomic space frames is universally synchronous irrespective of relative motions. Relative motions can only be known between relative positions in successive space frames. Light derives from atomic processes so that it can only move a specific distance with respect to each atom in each successive space frame. It must close the space in the integrated fabric of space-time by linking up all atoms of particulate matter. Light defines space relative to each atom. Space and time are quantized.

5) Time, as we are able to measure it as a linear phenomenon, is associated with the recurrence of space frames. We measure time by regular cyclic motions, such as the rotation of the earth, and these motions reflect a series of quantum jumps in position through successive space frames. Each successive frame thus specifies a universal primary interval of time. It is possible to measure the length of this interval in terms of classical units of time because each space frame recurs for a specific duration relative to the transmission of light.

6) Although a common simultaneity for separate bodies, in relative motion through space, may not be established through direct measurements with clocks, as relativity theory maintains,²¹ we may nevertheless attach a universal significance to the concept of synchronicity. Since there is sound evidence to clearly indicate that matter is inherently intermittent, it in fact must be synchronous if we are to perceive the material surroundings with any degree of integrity at all. Although synchronous distortions may be introduced through relative motions that affect spatial perceptions and our ability to make measurements, this does not discredit the fact that a preponderance of synchronous events still prevail. Even in extreme cases where synchronous distortions may be so severe as to result in black holes, these can only manifest relative to a preponderance of synchronous events.

7) Gravity is universally operative independent of transmission through space and time, since it is associated with the universally synchronous projection of the movie. It is an expression of an underlying unity implicit in all particulate matter. The attractive force of gravity resides in the universal aspect common to atomic matter separated in space. It works via the timeless quantum mode. The tendency to come together is an expression of the oneness of physical being, a oneness that is manifest in the boundless Void. In this respect the unity of the quantum Void is the conjugate inverse of space frames where atomic matter is separate and distinct. Since atomic matter oscillates between form and Void to define a primary interval of time what we see as separate matter is both One and Many at the same time.

8) Relative motions tend to distort the perception of space and time because light is unable to fully bridge the quantum jumps in position between successive synchronous frames, and yet the movie must cohere as a whole. In Newtonian physics this tendency manifests as a force required to accelerate one body with respect to another. This shows up as a discrepancy of units in the familiar relation $F=ma$. The units of force and mass are essentially the same, leaving a discrepancy in distance per second per second. This is a discrepancy of change in position through successive frames that represents a relative skipping of space frames associated with Force. This distortion in the uniform perception of space and time is balanced by an external expenditure of energy as work. This is the inverse of gravity as an attractive force that is implicit in the projection of atomic matter. We shall see that gravity belongs to a class of forces that function via the quantum mode.

9) When relative velocities approach the speed of light a more severe kind of distortion becomes apparent because relative space frame sequences are perceived out of synchronization. There is a

²¹ Einstein, A., On The Electrodynamics of Moving Bodies. In *The Principle of Relativity: A Collection of Original Memoirs on the Special and General Theory of Relativity*. Lorentz HA., Einstein A, Minkowski H, Weyl H. (with notes by A. Sommerfeld). London: Methuen & Co., 1924.

relative skipping of space frames balanced by a relative accumulation of quantum frames between different inertial systems, because light cannot otherwise bridge the jumps in position. The quantum sensorium, the Void, spans the relative history. This shows up as the familiar relativistic discrepancies indicated by the Lorentz transformations of special relativity. There is still no sound reason to believe that these transformations “...do away with the absolute character of the concept of simultaneity,” as Einstein stated. They merely account for synchronous distortions between inertial systems.

10) Space frames are skipped in the inertial system of the *observer* with respect to the moving body. This is balanced by a relative accumulation of quantum frames with respect to the observed body in motion. There is no compelling reason to suggest that the position of a so-called stationary observer is necessarily an arbitrary matter and that we must accordingly seek out mathematically covariant laws with respect to continuous transformations of space-time coordinates. This principle of general relativity does not take cognizance of the fact that experience is not presented to us in this way. Uniform patterns of cyclic motions dominate the heavens in a highly organized hierarchical manner, cascading down from galaxies to suns to planets and moons. When we speak of inertial systems as resisting acceleration we must therefore see it within the context of the theater in which we are observing the movie. Acceleration is always relative to the preponderance of synchronous patterns of momentum that prevail, for it both conforms to and disturbs those established patterns as they exist hierarchically. A classic example is Foucault’s pendulum.²² The arc of its swings is constant with respect to the fixed stars thousands of light years distant while the earth rotates under it. The gravitational pull between the pendulum’s bob and the Earth is distinct from the inertial rotational velocity of the Earth. The frictionless pendulum bob is synchronous with the frame by frame projection of the universe at large

11) Momentum is a quantization of uniform relative motion. This is inferred by de Broglie’s wave equation, where the quantum of action, h , is equivalent to the product of the relativistic momentum of a particle, p , and its wave length λ . If the wave motion of matter is a result of the oscillation between quantum and space frames, then it follows that the wave length assigned to a particle should be associated with the quantum jumps in position from one space frame to the next, relative to its stationary frame of reference in the projection of the movie. The product of the momentum and wavelength is equivalent to the universal constant, h . There is again a dimensional discrepancy of unit distance per second per second, which is associated with a synchronous distortion between the observer and the particle. The uniform motion of the particle is offset by a relative skipping of observer space frames. The observer in the relatively stationary frame of reference is also synchronous with the Earth in the movie production, moving with it in its orbs within orbs. A relative skipping of observer space frames thus has the effect of increasing the apparent frequency of particle space frames and reducing its relative wavelength accordingly. This is consistent with the alternate formulation of de Broglie’s equation, where the momentum of the particle increases with the apparent frequency.

12) Uniform velocities may be considered inertial because particulate masses are independently assimilated in the movie. The duration of each space frame is sufficient to allow light to

²² Baker GP. *Seven Tales of the Pendulum*. New York: Oxford University Press, 2011:388.

circumscribe any typical atom, but not larger conglomerates of atoms as molecules in concentrations of matter. The latter are assimilated through atomic characteristics that allow them to mutually relate collectively through interfaces of interaction. Within each space frame, however, activity is restricted to electromagnetic phenomena. The uniform motion of an atom, or a unified collection of atoms, is a quantized event, occurring from one space frame to the next, along with the preponderance of other synchronous events. If there is no change in the degree of synchronous relationships from space frame to space frame, then no forces are introduced associated with further synchronous distortions. Velocity, or the relative lack of it, is therefore inertial so long as the relative shifts in position from space frame to space frame are uniform. It should be noted here that this requires another kind of time, or rather timelessness, that is distinct from linear time as defined above in point 5.²³ There is a kind of duration that spans successive space frames to historically integrate the synchronization of events. This underlying timeless duration is a property of the Void, also referred to here as the *quantum sensorium*. For instance, there is a relative timeless accumulation of quantized energy associated with moving particles to balance the *relative* skipping of observer space frames. This is essentially a quantization of experience that does not actualize to the observer in spatially explicit form, although it remains associated with the moving particle as an increase in its relativistic mass, a physical contraction in the direction of motion, and a dilation of time.

13) A complete atom is a closed and spatially distinct entity. The photon energy level of the atom defines a closed spherical shell that constitutes the inner space of the atom as orthogonal and distinct from the external linear space between atoms. The relationship of photon to electron and proton therein is a closed electrically neutral relationship. If, however, an electron becomes excited beyond the ionization limit for an atom, then light is unable to bridge the distance within one space frame. The electron is said to be a free electron. Photon energy must span two or more space frames to close the relationship between electron and proton, and it is this spanning of space frames by photon energy that gives rise to electromagnetic fields. This also serves to integrate history over a succession of space frames, that is to say, light must link events over a period of linear time. Transmission of physical effects through the integrated fabric of space-time cannot exceed the speed of light because light defines space and time.

14) In the organization of moons, planets, suns and galaxies, there is a wide variety of phenomena that necessarily follow according to the above scenario, some of them well known. For example we know that somehow, since the consolidation of our solar system, that about 98% of the angular momentum has come to reside in the planets, even though 99% of the total mass resides in the sun. The rotational motion of the solar system introduces synchronous distortions with respect to the galaxy that are associated with angular velocity, although the mass of the solar system must be generally synchronous with the galaxy at large. This angular tendency to synchronous distortions manifests as a relative skipping of space frames in the center of the sun with respect to its own periphery and the peripheral planets. Although this is largely accounted for by fusion processes in the center of the sun that effectively contract space they can not account for the whole discrepancy. There is a corresponding accumulation of quantized momentum associated with the planets that cannot actualize, and yet it must manifest itself in some way, if it is not to build to unlimited

²³ Hanna T. Ed., *The Bergsonian Heritage*, NY: Columbia Univ. Press, 1962.

extremes. Since we observe a differential rotation between the center of the sun and its own periphery, it is reasonable to conclude that the accumulated momentum becomes translated as a force of retardation operative at the center of the sun. (The poles rotate in 33 days, the equator in 25 days.) This force is not transmitted externally through space, but rather internally via the quantum mode, as an internal winding down to preserve synchronicity. It is a force hitherto unidentified, and one of a small family of quantum forces operative on a cosmic scale.

15) The differential rotation of the sun accounts for the spiral wrapping of the sun's electromagnetic field around its girth, a portion of the field being swept out with the solar wind into the planetary disc and beyond. The great electromagnetic arches that pop out from the sun's surface, associated with sun spots and solar flares, appear as direct evidence of an electromagnetic bridging of discrepancies in angular synchronicity within the sun.²⁴ The sun's magnetic pole reversals, that occur approximately every eleven years, are also essential to balance synchronous distortions that would otherwise accumulate to unmanageable proportions. The earth's pole reversals are much less frequent and have a different focus.

16) When we turn our attention to the galaxy, we find that the focus shifts to the regulation of its material content, as distinct from the angular distortions within solar systems. The material content of the entire galaxy must be preponderantly synchronous, both with itself and with other galaxies, even though it is in rotation with respect to other galaxies in the universe at large. In galaxies that tend to rotate as a unit, there will be a skipping of space frames in their centers with respect to their peripheries that will tend to accumulate to cosmic extremes. At the limit this manifests as black holes in their centers, with a relative enormous accumulation of quantized energy with respect to their peripheral rotation. But we can also see that black holes in the centers of any number of galaxies represent one, common, singular condition, with respect to the universal cosmic projection of atomic matter. The physical universe, as we see it, is one synchronous event. There may also be black holes in the centers of globular star clusters, where stars move independently in elliptical orbits about a common center, and similar patterns may be expected in elliptical galaxies.

17) Because galaxies must be preponderantly synchronous, quantum forces may come into play in a variety of ways. Angular synchronous distortions in solar systems, place them in immediate communication with the preponderance of synchronicity in the universe at large. Discrepancies between the external space frame skipping associated with the angular velocity of stellar populations around the galactic center seek a balance with fusion processes that contract internal space-time in stellar centers. The relative imbalance between internal and external space-time is translated to the galaxy's stellar population as a regulatory force governing stellar migrations within the revolving disc. The entire stellar population of the galaxy becomes tensionally coupled within. It becomes one coherent whole. Stars must behave themselves within moderate limits and cannot go racing off without restraint at the beck and call of gravity, disturbing the synchronous integrity of the whole. Tendencies to excessive motions find a ready resistance. The apparent deficiencies in gravitational mass in current theories about galactic organization thus find new avenues of explanation that apply to many other phenomena as well.

²⁴ Glanz, J., Does Magnetic Twist Crank Up the Sun's Outbursts? *Science*: 269, 1517, 1995.

18) There is a growing body of evidence to indicate that there is reflux of the material content of a galaxy through the galactic center. In this scenario, old heavy stars that have contracted internal space-time through fusion processes tend to migrate toward the center, where the integrated fabric of external space-time is contracted with respect to the periphery. They are drawn into an accretion disc and torn apart as they spiral in toward a black hole at the center.

19) Bart Bok speculated on evidence that had accumulated as early as 1981.²⁵ The central bulge is known to contain a dense concentration of old stars. Within it, four concentric rotating rings of hydrogen have been identified expanding radially away from the center of the galaxy, the outermost, at 3000 parsecs from the center, being discovered in 1964 by Jan H. Oort and G. W Roogoor of the Leiden Observatory. Bart Bok comments, “*Perhaps the ring is a new spiral arm unfurling. One is equally tempted, however, to speculate that the center of the galaxy expelled a kind of smoke ring some 30 million years ago.*” At 1500 parsecs, Butler Burton of the University of Minnesota and Harvey S. Liszt of the National Radio Astronomy Observatory, identified another rotating expanding ring of atomic and molecular hydrogen. Another ring, some 300 parsecs from the center, has regions of hot atomic hydrogen containing newly formed blue-white super-giant stars. Another cooler and more dense ring exists only 10 parsecs from the center. It thus appears that huge amounts of material are being emitted periodically from the center of the galaxy, which is feedstock for new generations of stars. The central three parsecs contains the highest concentration of stars in the galaxy. Star sized clouds of ionized gas are speeding around the center at high velocities, their velocities increasing with their proximity to the center. This suggests old stars being torn apart as they are being drawn into a super massive region at the galactic center, presumably a black hole. The pattern of creative reflux is thus suggested by radio and infrared observations. The pattern is generally consistent, even required, by a synchronous universe. The creative reflux of experience is a phenomenon that we see all around us in nature, something that we do ourselves every day. We should have good reason to expect to find it a common feature of galaxies also.

20) Starburst galaxies exhibit high star formation rates 10 to 100 times greater than quiescent galaxies. Many galaxies emit strongly in the infrared region indicating high rates of star formation. In some cases the rate is so high that the entire galactic mass would be recycled in several hundred million years if the rate was sustained. Active periods lasting some ten million years are believed to be interspersed with quiet periods.²⁶ In a synchronous universe, galaxies function as cells that creatively renew their stellar populations. The heavy elements, created through fusion processes in stars are recycled back into hydrogen in the galactic core.

19) When we look through our largest telescopes at the distant quasars, some of them emitting more energy than a thousand galaxies like our own, from a core only a light year or so in diameter, what are we seeing? When we see them oscillate with bursts of energy equivalent to the creation of millions of suns over a period days, even hours or seconds, what are we seeing?²⁷ The light from a galaxy a few billion light years distant can be older than our solar system by the time it reaches us. We have circumscribed our galaxy a couple of dozen times, and the distant galaxies may be turning somewhat slower or faster, the rate of stellar reflux being adjusted accordingly. Yet we share the

²⁵ Bok J. The Milky Way Galaxy. Scientific American. March, 1981.

²⁶ Habing HJ, Neugebauer G. The Infrared Sky, Scientific American, Vol. 251, Nov., 1984.

²⁷ Thierry J, Courvoisier L, Robson EI, The Quasar 3C 273. Scientific American. v 264: June 1991, p. 50-57.

same synchronous present with that galaxy as it exists today. In the projection of the cosmic movie, light must bridge the intervening discrepancies in linear time due to relative rates of space frame skipping. The light that comes to us from distant galaxies spans the integrated history of change relative to us, since we are still synchronously projected from the Void as things are today. A number of effects are to be expected. For instance synchronous discrepancies alone can red shift the light that we see, and this is not necessarily associated with recessional velocity at all. It may only be associated with great distance. The associated history of relative space frame skipping shifts the frequency of the light toward the red end of the spectrum. Synchronous discrepancies accumulated over such a time can also greatly accelerate the apparent relative frequency of distant events, similar to de Broglie's moving particles but on a grand scale. Synchronous distortions may contract the history of stellar reflux in distant galaxies in the way that we perceive them, creating an illusion of highly exaggerated violent eruptions where none existed in reality. Such phenomena might be expected as observational homologues to real ejections of matter from galactic centers. Alternatively distant galaxies that have lower rates of relative space frame skipping may appear to be fragmented. There is no compelling reason to suggest that we are looking back in time toward the original creation of the entire universe. In view of the above, there are more compelling reasons to suggest that the universe never had an origin, that the creative process transcends events in linear time, that its history of change is eternally organized via the quantum sensorium.

20) The background microwave radiation is there, of course, and real. But is it really a remnant of the separation of matter and radiation during the early epochs of a supposed big bang? Given the current state of our understanding, there may easily be other explanations. This single wisp of evidence is hardly sufficient to support the theory in the face of mounting contradictions. To begin with, any theory of a universal physical origin at some primordial point in linear time must face formidable philosophical problems, fundamental contradictions of logic, reason, and self consistency, as is well known yet set aside. Such an origin negates any concept of natural order on which the theory may itself be based, placing us outside the whole of creation, divorced from our own experience. This renders the theory devoid of pragmatic value, for we find ourselves faced with a need to integrate history in order to cope with experience accordingly in an ongoing context. This problem aside, we can hardly extrapolate experience with confidence many orders of magnitude beyond what we can ever hope to verify by observations or experiments of any kind.

21) Even in the observations available to us there are serious problems. Some globular clusters in the Milky Way and some galaxies appear to be about 15 billion years old,²⁸ perhaps more, which stretches the upper limit for a big bang thesis. For example, radio galaxy 4C41.17 was found by Kenneth Chambers, George Miley, and Wil van Breugel to have a Doppler shift of 3.8, corresponding to 15 billion light years. A detailed study of seventeen of the oldest globular clusters in our galaxy places a median age in the distribution at 14.56 billion years.²⁹ Some globular clusters have been shown to have ages of about sixteen billion years, twice that allowed by some values proposed for the Hubble constant, which keeps being adjusted to suit.^{30, 31, 32} We are surely advised

²⁸ Waldrop, M.M., *The Farthest Galaxies: A New Champion*. Science, 241; 905, 1988.

²⁹ Chaboyer B, Demarque P, Kernan PJ, Krauss LM. A Lower Limit on the Age of the Universe, Science 271; 957, 1996

³⁰ Van den Bergh S. Ages of the Oldest Clusters and the Age of the Universe, Science: 270:1943, 1995

³¹ Bolte M, and C. J. Hogan, Conflict over the age of the Universe. Nature; 376:399, 2002.

to look for more realistic alternatives to the clumpiness of the universe and the missing mass than to undertake the invention of dark matter. Attempts at the computer modeling of cosmic evolution using various starting mixtures of dark matter are problematic even if it did exist.³³ The missing mass is not a problem in a synchronous universe where galaxies are eternal cells of creatively regenerating their stellar populations. The mass missing is accounted for by the contraction of space-time in fusion processes and by quantum events in the centers of galaxies with respect to their peripheries, integrating their dynamic integrity and their eternal regeneration. The universe may be clumpy. The age of stars does not have to be confined within an acceptable birth date for the entire universe. Galaxies may exhibit different characteristics, migrate, form loose associations, evolve and change, all within synchronous constraints. The background microwave radiation is related to the primary interval of time with respect to the preponderance of synchronicity in the universe at large.

22) A synchronous universe introduces limitations in the application of mathematical methods currently available, because the properties of space and time, as we measure them, are not continuous. There is thus a minimum limit to the increment of the differential in the calculus that becomes very significant in quantum events. The uncertainty principle is related. The relative position of a moving particle can only be known precisely within a single space frame, whereas the relative momentum can only be determined over a succession of space frames. These characteristics are implicit in the nature of phenomena whether our measurements interfere with them or not.

* * *

The list could go on indefinitely, for we have only begun a review of the evidence, and haven't mentioned planetary processes, biological or social evolution, neurological processes or the nature of the mind. The above points should nevertheless be sufficient to indicate a need for a more fundamental and comprehensive insight into the cosmic order. They also suggest some clues as to what we require, and the general pattern of what we might expect, as follows:

i) We are concerned with the historic integration of the whole of experience and thus with the relationship of parts to the whole. This must allow for all possible variants of experience.

ii) There is an all pervasive dynamic interdependence between universal and particular aspects of experience that is fundamental to understanding the nature of phenomena of every kind. This is intimately associated with alternate modes in the cosmic projection of experience.

iii) The integration of experience displays hierarchical elements associated with degrees of universality subsumed in nested levels, as in the synchronous relationship of galaxies to suns to planets and moons. These hierarchies, as they are spatially perceived, are specific manifestations of a transcendent universal order.

These few points will suffice to sum up general objectives and guide lines to be pursued as a starting point in subsequent Parts.

³² Travis J. Hubble War Moves to High Ground. *Science*; 266:539, 1994.

³³ Jayawardhana R. A Dark Matter Recipe is Tested and Found Wanting. *Science*; 264:1845, 1994.