CHAPTER 3

Evidence and the Theory of Confirmation

In this chapter, we shall explore the types of evidences that are adduced for scientific theories. It would explore Hempel’s classification of evidences and then proceed to examine how evidences are understood in contemporary physics and other human and natural sciences. This would be done in order to generate a theoretical argument about the role of evidences in scientific inquiry. Further the chapter pursues the question, can evidence be good enough for confirming and disconfirming theories in science.

The role of evidence in confirmation theory can be understood in terms of explanan-explanandum relationship. This relationship, as it could be seen in the physical theory/explanation, according to Hempel and others, assumes only a certain degree of reliability making evidences fallible.

Universal generalization and the role of evidence

Deductive logic presupposes that scientific statement can be express in the form of universal generalization (UG). A statement like “all ravens are black” which is a universal generalization based on observation (evidences) presupposes a class of “black” object to which all “ravens” belong. In other words the class of “ravens” belongs to the class of object “black”. Therefore, using Hempel’s logic, anything that belongs to the class of “ravens” must also belong to the class of “black”.

Contrastingly, there can be two cases –
(i) Something that is not “raven” but belongs to a class of “black” object.

(ii) A raven which is “non-black” yet a raven.

The possibility (i) indicates that something that is not a “raven”, yet belong to a class of black cannot be distinguished from the class of “raven”.

This can be understood by following the rules of ‘obversion’;

I. All ravens are black

II. All things that are non-black are not ravens

III. A white shoe is not a raven

IV. A white shoe is a non-human (assumed)

This shows that universal generalization’s statement cannot withstand the consequence of the “rules of obversion”. This is what makes the Hempel’s paradox

**Universal generalization statement**

Consider the following statement;

I. If all (x) is hit H, then all (x) break

\[(x) (Hx \supset Bx)\]

II. If all “x” is hit and all “x” breaks, then something else also breaks.

The above premise explains the other kind of universal generalization and is express as follow;
UG 1 – For any “x”, x is hit implies that x break

UG 2 – Then if all “x” is hit and if all x break, then something else “A” also breaks.

The class “H” and the class “A” are two different classes sharing a common element “x”. But the consequence is that if “x” is hit then “A” breaks although the class “A” has had other elements. This shows that universal generalization statement (I) established a strange connection between two distinct class in terms of the property of either “H” or “A”.

Further the connection is such that the two classes get affected by single instance. The implication of this model is that, to disjoin that classes may get connected by shared property; while the class together may not instantiate the same shared property.

The systematic inter-relatedness of properties arises from the relationship establish to universal generalization. Such universal generalization relationship takes the form of simple mathematical equation such as;

\[ P = mf \]  
(Newton’s second law of motion i.e. the rate of change of linear momentum is proportional to the force applied, and take place in the straight line in which that force acts).

But the question is whether such equation was valid in all cases. The only metaphysical implication that can be drawn from such generalization is that the relationship is “universal” if and only if it can be validate with equal probability.

Hempel’s paradox and this subsequent classification can be derived as follows;
(i) All ravens are back

(ii) All non-black things are non-raven.

Using universal generalization, in claiming “all ravens are black”, the following paradoxes arise;

Paradox 1 – Non-ravens can also be black

Paradox 2 – Non-ravens can also be non-black (say a red pencil)

Hempel assume that scientific statements are necessarily deductive in nature. In a statement “all ravens are black” implies that if there is a “raven”, then it is necessarily “black”. In other words, Hempel identify the class of object (namely raven) with the class of property (black). He deduces the object from the property. This create the so called the paradox of material implication;

1) The same property i.e. black can be shared by many different objects

2) The same object i.e. raven can have different property shared with other objects.

In a sense, the property “black” can be shared by both “raven” and “non-raven”. Look at it in another way, both “raven” and “non-raven” may shared some non-black properties. In the case of (1) it would be difficult to distinguish between raven and non-raven sharing common property “black”, where as in case of (2) it would be difficult to distinguish between raven and non-raven sharing some non-black property.
Now a cursory look at Einsteinian relativity, once comes across an idea of space-time curvature as an effect of gravity that violates Newton’s laws of motion by bringing in position and velocity in relation to time that slows down or goes faster, depending on the speed of light in the universe. How depending on inertial frame of reference Newton’s laws are violated is described like this,

Zoe throws a ball from the centre of the merry-go-round. To Zoe, turning clockwise with the merry-go-round, the ball seems to curve to the left - it travels anti-clockwise. To an observer who is not rotating (e.g. someone in a helicopter above, picture at right, or to Jasper, sitting on the ground), the merry-go-round turns clockwise and the ball travels in a vertical plane (and thus a straight line, seen from above).

If you forget the outside world and refer everything to the frame of the merry-go-round, then you need to invent other fictitious forces which make moving objects turn. Newton's laws work in systems that are not spinning with respect to the distant galaxies. In frames of reference which spin, the 'extra forces’ that have to be invoked to retain Newton's laws are fictitious forces called centrifugal forces and Coriolis forces.\(^1\)

It turns out that centrifugal force and Coriolis forces are both non-inertial forces, looked from outside the reference frame and hence violates laws of motion with reference to an inertial frame.

\(^1\) https://newt.phys.unsw.edu.au/einsteinlight/jw/module1_Inertial.htm, accessed on 3.4.2015
What comes out from here is that, the law of deduction cannot apply to the case of object belonging to different inertial frame, i.e., an altogether class, and further it cannot apply to different classes sharing some common object. If we inertialize objects in motion and further quantize the general relativity of ‘speed’ of photon, then it turns out that ‘general relativity’ includes space-time itself, on the basis of which motion is determined. Quantizing general relativity create a theory within which mass moves and events happen and such a theory remains independent of the background of general relativity and Newton’s laws of motion.

In other words, law of deduction can apply only in a strict logical sense where one can establish the specific limit of various classes in terms of a relationship of “belonging”. But “belonging” involves the law of complementarity. Whether gravity as a force applies to Quantum particles and whether it can apply when light beams speed up or down can be a complementary situation of collapsing a massive object under its own gravity into a black hole and adding Quantum uncertainty to space-time itself turning it into quantum fluctuations and chaos. The certitude of Newtonian non-inertial frame gets substituted by Einsteinian co-variance between time and event in a moving inertial frame, to be replaced by singularity of collapse of gravity and workings of various weak forces in it leading to further fission.

Law of complementarity and law of deduction most often come in conflict. The reason being the logical fact that assignment of values to a singular statement, which is singular and affirmative, is always from the class of which it belong and this values are mutually substituted in the class of objects. The law of complementarity is such that the
substitutable value will have the same universal property, but the problem is how one distinguishes between one value and the other (a unique property that is in the object enables the object to distinguish itself from the other).

This result into what is called the “problem of demarcation”. Simply stated, the problem is that, can we ascribe the “properties” and “qualities” that are unique to an object? Properties that are necessary are necessary property because object cannot exist without property. Therefore, as and when an object comes into existence, those necessary properties will also occur. This gives us a criterion of necessity for demarcation. Necessary property are not shareable, they are strictly related to an individual object that belongs to a certain kind.

The problem of demarcation can be approach from two different ways;

1) Continuation of the same identity across different world with respect to necessary properties.

2) Change of identities on the basis of certain properties.

Both these criterions operate with a certain degree of belief and such belief is based on observable evidence. If the evidence is strong, the belief in persistence of a certain “identity” is also strong and strong belief depends on stronger possibility of evidences. For example if in a certain world there is nothing like “non-raven non-black” entity, then it confirms that “all ravens are black” and necessarily true. But if there are “non-raven” and “black object”, then this may disconfirm “all ravens are black”. Therefore degree of belief determines the extent to which demarcation is possible. The situation could be
compared with ‘moving charges’ creating their electromagnetic fields depending upon how they violated fixed laws of attraction and repulsion. Moving charges will experience contraction of distance by special relativity, that is, the charges will be affected by the extent to which time will slow down in a dynamic inertial frame. One should surmise about computational evidence for shifting charges, which does not happen except in an experimental set up. Clearly Maxwell’s equations specifying static charges cannot apply on Quantum particles, as these particles fluctuate in time-space under relativity. In no way such Quantum particles and the effect of gravity on them could be evidenced as a physical phenomenon.

**Hempel’s classification of evidences**

It seems that this mere observation of a ‘white shoe’ is enough to confirm the general accepted hypothesis ‘all ravens are black’. Further, if the observation of a white shoe provides enough evidence confirming the hypothesis then we have come to the situation where to claim that ‘all ravens are black’ using ‘white shoe’ as an evidence, we don’t need to observe any raven at all. More confusing follow as a white shoe continue to play an important role in confirming an unrelated hypothesis. When white shoe confirm such a vague hypothesis like ‘all ravens are black’ without observing any black raven, then it can also equally confirm a statement ‘all raven are pink’. Now, how can an evidence of a white shoe confirm ‘all ravens are black’ and ‘all ravens are pink’ simultaneously. But inductively, the observation of a white shoe i.e. non-black non-raven is entirely irrelevant to the refer hypothesis ‘all raven are black’. Thus, this very problem that we encounter
while confirming such a simple hypothesis led us to a paradoxical situation and a strange improper solution.

The problem is not in the entire generalization of a ravens, but in our effort to confirm a hypothesis that the problem arise. Hempel’s problem is thus a problem of Induction. The principle of Induction which is supposed to be an instrument in making a justified statement about the world become problematic and now it poses a serious problem in our study of generalization. In confirming any theories, what sort of evidence will give an absolute confirmation or if evidence seems so conflicting in our judgment, then is it not necessary at all to confirm any theories.

Hempel contributes immensely to the concept of ‘confirmation’ in scientific laws and theories. Confirmation is such a process that one can maintain the distinction between observable and non observable facts. This Hempel dilemma exposed the problem that not only observable facts and events alone can confirm a hypothesis. Now unobservable facts can also confirm the hypothesis. In other words, Hempel introduce to us the importance of ‘unobservable facts’ in our quest to confirm laws and theories. The situation could be better understood if we take a case like Heisenberg’s model of assignment of Quantum number to a Quantum orbit in such a way if a particle jumps from one orbit to another, Heisenberg calculated that ‘intensity of a spectral line resulting from any quantum jump is the sum of products of the amplitudes for all possible intermediate jumps’. This is not evidenced in actuality as there could be a situation in which a product of X multiplied by Y is not same as product Y multiplied by X- a potent non-commutative situation in which rules governed product of amplitudes is no answer in understanding Quantum jumps.
What changes the very nature of the phenomenon under consideration? What could be an evidence for justifying such a change? Heisenberg’s answer to the question in terms of product of multiplying matrices also could not be sustained, as ‘position-momentum commutation problem’ remains in place giving rise to fluctuating relations between ‘energies of stable orbits’ and ‘emitted radiation’.

Wherever an observed linear relationship is broken, giving way to indeterminism, it is possible to show that ‘unobservable’ have rules the scenarios. Changes in spectral lines due to external electromagnetic fields due to more complicated quantum principles interacting with electron spin and orbital magnetic fields can be an unobservable that could only be mathematically calculated without a corresponding physical reality. In a multi-electron atom, energy levels cannot be predicted at all and in case of neutral atom of Helium, the linear relationship of matrix multiplication is directly violated as it happens with Helium atom. Many states of energy with splitting spectral lines will appear in case of multi-electron atoms and in case of Helium too.

Hempel’s problems are one such classic example of the problem of confirmation. In our attempts to confirm a particular hypothesis we encountered certain problems and difficulties which requires serious attention. In the events of confirming a hypothesis “all ravens are black”, we employed a number of evidences that we collected through our observation. Using certain condition (equivalence condition) an evidence of a white shoe

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can confirm the very hypothesis. As a cluster of evidences are brought about, certain number of observation and another irrelevant evidence like a white shoe are equally playing a key role in confirming such a vague hypothesis like ‘all ravens are black’. This is the case of certain number of evidences that are conflicting against each other. This is one such problem involved in the problem of confirmation.

**Evidence and confirmation**

As is discussed in both Chapters One and Two, it is better to single out a few problems in the relationship between evidence and confirmation in the larger context of violation of standard model. These examples would problematize the very notion of evidence and it would add up new dimensions to theories of confirmation.

A mathematical object of 10-dimensional perfect fluid in which ratio of viscosity to entropy density of the fluid is a constant that ‘could be expressed as a mixture of fundamental constants from the quantum world’ is found out at the Brookhaven physical laboratory by Dam Thanh Son, a leading scientist. The implication of this finding is that Heisenberg’s uncertainty principle that predicted there will be lower limit to such a constant and fluids that could approach such a limit would have supercooled atoms or plasmas created at the particle colliders. Even the ratio of viscosity to entropy for water is 400 times higher than 10 dimension supercooled fluid. What the Scientist Son has stated is that lower limit for the ration of viscosity to entropy in real fluids exists, but it cannot be proven. A universal constant in terms of which giant black holes can be described is an

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abstract mathematical entity that can be applied in real fluids, but it cannot be proven to exist in real black holes, except mathematically. The import of such a situation in natural sciences is that physical laws underlying a mathematical formulation are often unverifiable and unobservable, as they act as self-evident. But self-evident laws are not sufficient to empirically prove a hypothesis and without empirical proof such a hypothesis has not much experimental application.

Similarly a set of new laws of physics that are violative of established physical laws is experimentally proven. For example, in the Brookhaven laboratory, in the Relativistic Heavy Ion Collider (RHIC), the scientist accelerated gold nuclei in a path of 2.4 mile underground ring with almost 100 times velocity of light and collided its protons, neutron and free constituents of these particles such as Gluons and Muons. The idea was to melt them into particles called quark gluon plasma, which exited only for microsecond at the beginning of the universe. This violates law of parity, which is, if we mirror the laws of nature, it must remain the same. In case of RHIC collision experiment of quark gluon plasma, it violates the black hole structure of protons and neutrions and relegate itself to plasma state. This relapse into plasma state is also a symmetry breaking phenomenon of mutual contraposition between matter and antimatter by violating the law of parity.

Apart from violation of law of parity, certain reactions are prevented by the chirality, or handedness, from taking place in chemistry and biophysics such that emerging forms of organic life is not disturbed. In such cases evidences weigh against existing laws of nature. In a state of supercooling, laws of irreversible entropy fail to work. Such a phenomenon is explained in this way,
Physicists suspect that the left-handedness of neutrinos might have contributed to the most lopsided feature of the universe of all, the fact that it is composed of matter and not antimatter, even though the present-day laws do not discriminate. The amount of parity violation that physicists have measured in experiments, however, is not enough to explain how the universe got so unbalanced today. We like symmetry, Dr. Kharzeev, of Brookhaven, noted, but if the symmetry between matter and antimatter had not been broken long ago, “the universe would be a very desolate place.”

When the charges gold ions blast at each other, a tremendously intense magnetic field is produced, roughly 100 Gauss that turns plasma into a liquid, a highly improbable feat to achieve. Such plasma turns into 14 billion bubbles, compounded with corkscrew effect of the collider that mirrors birth of a neutrino star in billionth of a second time with symmetry violating bubbles. In case of other such experiments of accelerating sub-atomic particles in colliders made to test physical laws of symmetry and antisymmetry. In such experiments, basic material indices of black hole such as ‘viscous density’ of the liquid surface and its internal disorder measured in terms of ‘entropy density’ of a mathematically described ‘black hole’ of 10-dimensions can only be expressed in terms of mixtures of fundamental constants from quantum world.

The question is. Is there any role of evidence in confirmation? In terms of Quantum reality, it is subjective evidences, more than the causal and objective that collapses from

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multiple simultaneous states to a single actuality. A collapse is an observer’s measurement of certain wavefunction that collapses another wavefunction at a distance, had the observer come in contact with that wavefunction. This is how an act of observation cum measurement effects an action at a distance and the valuation that an observer ascribes to a measurement situation are all the personal judgments of an agent. One of the ways that the agent can bring in some certainty in her measure is to adhere to a certain relation that yields a definite probability with respect to a certain quantum state assignment. Further a measuring instrument is an extension of agent’s own act of observation.

The knowledge of a quantum state within ‘degrees of belief’ to which the subject as an agent confers upon it, but the physical state or information about the world that subsists with it cannot be characterized as informational with positive operator-valued measures. In other words, a quantum state represents the information that a hypothetical observer can possess optimally, while at the same time, an informed agent can formulate a state to encode her probabilistic measure of information contained therein. For example, suppose one observes an electron with the probability to measure its spin up is 50% along an axis and then one finds that indeed it is 50%. So the measure becomes 100%. It means that we have updated the prior probability of the “up” spin after obtaining it in the new situation of measure. This is how an observer can update prior information by obtaining new and then calculating the new probability, which is a collapse into a singular state. It implies that ‘wavefunction’ of a specific electron is a sum total of ‘prior’ and ‘actual’ probabilities and thereby simultaneously calculating probability of the event of collapse under the condition that one has a chance to observe how it collapses.
In the process of calculating probability of the collapsed wavefunction, Bayesian interpretations of the quantum state tend to suggest using novel quantum measurements to represent them (for instance, the symmetric informationally complete positive-operator-valued measures and complete sets of mutually unbiased measures). They also suggest interesting operational interpretations of the quantum-state and quantum tomography via the use of the pure-state informationally complete measurements and the quantum de Finetti representation theorems. The conditional probability that wavefunction will collapse will accommodate assignment of a Bayesian measure to a state. Such an assignment overcomes classical noncommutativity, as the underlying physical reality of ‘action at a distance’ could be made commutative under a certain degree of belief. The multiplicity of decomposition of pure states into entangled and mixed states mark noncommutativity of measurement displaying nonlocality assumes newer entanglements. This would allow assignment of probabilities to statements about the probabilities of other statements about collapse.

**A possible confirmation theory**

Using statistical method, we arrive at certain conclusion about certain events by approximating the data we considered. In quantum world, a particular outcome or a result can be drawn taking into consideration the frequency of occurrence in that particular event. Particles therefore can be describe and determine by statistical tools provided for making probabilistic conclusion. By taking the frequency of occurrence out the number of examined facts in any particular events can we approximately defined the nature of reality in that very event.
What brings us here is the foundation of mathematical reality. Probability theory becomes an important instrument for describing reality in mathematics. Yet this can also lead one to an abstract mathematical concept. If probability theory of reality can be account for in mathematics then what will be the implication of that mathematical reality in the actual world. Does it make the world or external reality more probable and uncertain? And what is more important is its consequence on the nature of reality depicted in Quantum mechanics. Reality become probability and probability become reality and we are lead to the most startling facts: We are thrown into a kind of world where there is full of possibility.

Using Bayesian model one can think of the universal agreement is that E provided strong support for H. However, since E is part of the background then known to a foundation theory such as Einstein’s, we have E&B = B so that P(H|E&B) =P(H|B) which shows that E is evidentially inert. If this objection is sustained, it means that a confirmation theory employing only the quantities P(H|E) and P(H|E&B) cannot support the judgment that E is good evidence for H. The obvious escape is to replace the prior P(H|B) with an adjusted prior P(H|B’), where B’ is the background B with E somehow excised.5 This would allow us to consider degrees of belief attributed to certain prior states of supersposition to support a specific calculation of collapsed state.

Particles’ behavior and the double slit experiment

Newton described light as a stream of particles. Einstein found that light particles consist of photons. In the famous double slit experiments, charged light beams passing through two slits positioned one after the other in a an angle and collected on a photographic plate at the back show an intense polarization and superposition that the initial light rays do not have.

An experiment where a particle changes from one state to another, and in the process become inconsistent: What it becomes instead of what it is which could be called “the law of becoming.” In the double slit experiment, it is seen that superposed states of particles can be known using prior probability, but such prior assignment of probability does not create evidences that could assure consistency in the larger body of evidence related to superposition. The phenomenological turn in confirmation is to ground evidences in physical realities that create them.

Reality, as explained in the double slit experiment, is not what it is i.e. the actual state, but is solely but what it becomes at the later stage. Reality is, therefore, not a fixed entity but something that changes. The double slit experiment constructs an idea of reality by observation.

Phenomenologically speaking, fundamental forces and the possible mathematical objects of more than 3-dimensions can be treated within a certain kind of symmetry, but the question of unphysical entities such as negative time and other such inconceivable
mathematical abstractions lead us to mere abductive inferences from explanations with the highest likelihood.

The question arises, can physical reality be necessarily a bedrock for quantum phenomena of superposition, or is it a mathematical structure? Plurality of mathematical explanations, mainly based on overcoming the limitations of an earlier version is directed at finding out empirical adequacy and predictive efficacy in the realm of phenomena. An emergent dynamic correlational structure of evidence and its attendant physical reality mark contemporaneous parts of a global process independent of local states.

A possible phenomenological critique of confirmation

As subjective degrees of belief and choice of a certain stage of dynamic co-emergence has a non-linear dynamics of an autocatalytic kind and it assumes a global to local transition of phenomena under consideration. Both these aspects of dynamic co-emergence have an implicate consequence of ‘constraining’ the local by the global as well as constraining constituent elements by the downward causal limitations. In superpositions, collapse into a singular state gets a physical description only post-hoc, as the physical reality in the stage of dynamic co-emergence is deferred or delayed only to be enacted by a certain kind of intervention from outside. Seemingly, there is a computational subjectivity that transforms the physical basis of dynamic co-emergence into a causally excluded ground.
The causally excluded objective grounds of dynamic co-emergence between evidence and a phenomenon leads us to something like a representationally closed descriptions, as it happens in a theoretical explanation of confirmation of a physical phenomena.

Deconstructibility of Infinite as a phenomenal challenge to a phenomena into finite spaces with limits to its computability is a recent work by Yokoyama and Patey on Ramsey’s Theorem for n-tuples and k-colours admits possible infintite monochromatic subset. The implication is that an infinite algebra on metric spaces can be finitistivally reduced with certain constraints within a proof-theoretic system. Yokoyama and Patey have further showed that finitistic consequences are true with or without infinity. This comes close to an ontological model of denumeration of a set that is present in a situation of infinitistic subsets, which has an extension that is generically indiscernible. Denumeration creates conditions of indiscernibility. This allows us to bring in how language separates the indiscernible and such a language provides the reason for existence of the indiscernible. Denumeration comes close to a potential realization of Hilbert’s theorem that wanted to create conditions of finite closure of mathematical objects for the sake of ‘deductive consistency’. But superposed states undermine the idea of consistency by turning closure into an abstract multiple that fits into the generic extension of a denumerated formula, within which statements of set theory would become

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undecidable. For anti-realists, undecidability is an outcome of set theory itself, while in Ramsey type cases of finitistic reduction, there is a void of excess and an opening toward the impossible. In theories of Ontology, for example, Charles Chihara’s ‘surrogate natural number open system’ is an opening toward such an impossibility of a first-order language of description of the world. Such context dependency of symbol manipulation in terms of an unalterable signifier-signified relationship that makes reprogramming subject to laws of *eigenstates*.

What denumeration attains is much more than this model or proof-theoretic explications. It attains the most significant mark of finitization, namely, explicit maximal clique embeddings that ensure triangulation of optimum or the minimal closure. This minimal closure has a metaphysically anti-realist consequence of a ‘more twisted and devious limit that is invaginated’ in language of Quantum physics that goes towards an apparent dichotomy of decoherence and coherence. This also marks a truth asymmetric situation of denumerated part of the expression determining the form of expression in finitized subsets as true and predictable, while the mix of both remains independent of such coherence. Claims of correspondence and extensional equivalence between denumerated set expression and quantified version of the same arise without any interdefinibility between the denumerated and the numerated.\(^8\) An example of this interdefinibility arises in eigenstates that *represent* the externally observable manifestations of the phenomenally accessible cognitive states. Continuous time-evolution of wave function

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\(^8\) In high energy physics, non-relativistic constituent Quark model, denumerated energy levels of Quark gives rise to anti-quarks, but again succumbs to impossibility of free Quark and no predictive success in multi-quark system.
and generation of discrete line spectra from superpositions of eigenstates with different energies combines phenomenally accessible Quantum states with manifestation of eigenstates, but such measurements will require completely incompatible measuring devices, which mean that possible interdefinibility between incompatible states can happen due to non-locality. Such non-locality is expressed in different eigenstates of incompatible Quantum states.\(^9\)

Such eigenstates, in case of material symbol system (MSS) in biological-genic organisms turn out to be fuzzy that takes care of emergent causal networks between internal-external environments, in which biophotons and other such bioparticles display quantum states.\(^{10}\)DNAs emitting photon particles violate gene copying in mRNAs in order to encode biophotons and break the usual protein sequence. For example, rhythmic localization of Kai-proteins could be affected by phase interactions of dispersed biophotons. It is known that synthesis of proteins in DNA pairing happens through transport of electrons and photons, many of which create their own dispersion laws and processes.\(^{11}\)

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\(^9\) The Quantum state of the system and the classical state of the measurer creates an ontological problem of contrasting interference patterns in a ‘spontaneous symmetry breaking’ as manipulation of wavefunction could be worked out by electromagnetic fields.


In other words, a phenomenological description of non-ideal and non-normative type of interactions in the material and symbolic structures of an assumed phenomenon may not always be recursive and repetitive, rather they remain open to several exogenous processes of interference and thereby refuses closure and open themselves up to noncyclical behavior, a form of non-locality overshadows at the micro and macro level of phenomena and in the due course of micro-macro interaction. So the explanan-explanandum relationship in contemporary practices of Science cannot be accessed following deductive-nomological models, as such linerality would unnecessarily curb the continuous process of emergent phenomena. So a model of explanation parasitic upon the phenomena, as originally thought by scientist and philosophers is now substituted by an increasingly uncertain and denumerated domain of particles, vacuum and other such highly intuitive substances. Time-reversing any physical objects, or subjecting them to sub-atomic collisions keep challenging existing mathematic structures and ‘reverse mathematics’ takes over to switch over to another possibility of non-deterministic universe, in which our line art thoughts also would be completely altered. The simple question that haunts us, can we measure and predict Quantum jumps and can we predict outcome of reverse mathematics? As we are increasingly facing such indeterministic universes opened up by natural sciences before us, can theories of confirmation now blink?