

INVITED TALK

UNIFIED SCIENTIFIC THEORY BASED ON ORDER DISORDER CONCEPTS: APPLICATION TO SOCIO- ECONOMICAL DEVELOPMENTS OF INDIA

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ABSTRACT

Aim of this presentation is to discuss the Unified Scientific Theory based on order - disorder concepts developed in recent years (2012-2016) and its applications to different systems such as atomic systems, bio - radiation systems (Biological and Medical) and social systems (Humanities). For the first time the Unified Scientific theory has been applied for the case of social systems. In this regard we considered the case of developments of Indian society and Indian economy.

Nature (symmetry) and Universe (randomness) affect to every event. Natural order can be understood in terms of invisible parameter time 't'. Order – Disorder Transformations (ODTs) are relevant to understand it in form of an Action, which develops a Unified theory as advised by Lord Krishna in Bhagwadgita. A point of no difference in between such conjugate quantities as completeness and incompleteness, creation and destruction, happy and sorrow and life and death etc. attains the state of spirituality. Their workings are balanced and maintained by Nature.

The obtained results are encouraging and the presentation reveals that over all the development depends on the individual activity efforts and disorders minimization. Proper management of all the seven parameters considered is very essential. Population is the most affecting factor (maximum contributor of pollution) as well as agricultural growth also contributes a lot. Proper governance and corruption free environment are equally responsible for the developments of Indian society and Indian economy.

1. Introductory: The aim of my today's talk is to highlight about a new scientific theory based on order and disorder concepts and its applications to different systems of the Universe and Nature. Especially in today's talk for the first time the application of the theory will be discussed in case of Humanities, i.e., for the socio-economical developments of India.

Today's talk is based on my recent publications (2012 -2016) of a series of twelve research papers based on order disorder concepts. In first two papers ^{1,2} a new scientific theory has been propounded and Order Disorder Transformations (ODTs) has been described, which are responsible for the development of different characteristics. In next two papers ^{3,4}, the theory has been applied to the evolution of universe and evolution of life. A new theory of Action, based on the propounded scientific theory, has been established in fifth paper ⁵, which is analogous to the - Karma Theory of Bhagwadgita. Order Disorder Transformations (ODTs) are relevant to understand it in the form of an Action. Also in this paper the results of earlier, pioners, Planck, Einstein, Niels Bohr, Heisenberg Debroglie etc. of atomic systems have been reproduced by present Unified Scientific theory. A new theory for Geomagnetism has been developed by incorporating Unified Scientific theory in the sixth paper ⁶. In last three papers ⁷⁻⁹ the author and his coworkers have applied the scientific theory in case of bio-radiation to understand its dynamics, Cosmos energy / Soul and human's life and death systems. A new quantized energy

particle Lifton (life energy particle) has been proposed whose energy $E_{\text{Lifton}}(T,t)$ is double parameteric temperature, T and time, t dependent function. Lifton is the quantized energy particle of bio-radiation. A theory of bio-radiation has been also described.

2. Order – Disorder Concepts: Order and disorder are two conjugate physical quantities. Order refers to symmetry and disorder refers to randomness. Everybody and system of our universe and nature possess the characteristics of order as well as disorder, i.e., order within disorder and disorder within order is the nature of all systems and bodies. Nature and Universe are two different entities, which affect to every event. Nature follows a complete order behaviour while Universe follows random behaviour. Completeness refers to natural characteristics as it is associated to symmetry. Disorders refer to incompleteness- a quantity of the Universe as created by Nature. The law's of Nature can't exist without time. The existence of Nature (an ordered entity) is itself a manifestation of time. It can be believed that something exist beyond time, which has transformed itself periodically leading to the apparent creation and destruction. Time "t" is an invisible parameter, which describes natural order. The whole space is filled up by matter and radiation which have dual characteristics of particle and wave. The scientific theory describes that the dual characteristic develops due to ODTs. ODTs are responsible for producing particle and wave characteristics (dual nature) in matter and radiation both, which is supported by third law of thermodynamics.

In condensed matter sciences, superconducting state at 0°K is an example of complete ordered state- an ideal state of matter. However, as the temperature rises resulting in thermal agitation of the particles, the matter moves towards a disordered state. A gaseous state at its maximum temperature corresponds to a disordered state. A solid can't be considered a complete ordered state of matter. Generally, the metals at melting point and nearby this temperature are known as disordered solids. Fluids (liquid and gases) possess random behaviour; therefore we may consider them disordered state of matter. As one move from solid to liquid and liquid to gas the distance between neighboring atoms increases and that's why a gas is more disordered as compared to a solid.

The regular arrangements of points in space followed ordered arrangements. Similarly a class of children arranged for physical training purposes look like an ordered arrangements. The degree of an order in the material system may be judged from different points. Generally, solids show long range order while fluids show short range order. Inter-ionic potential energy curves show such differences very well.

3. Unified Scientific Theory: Heisenberg¹⁰ developed the uncertainty principle in year 1927. This principles describes that it is impossible to specify precisely and simultaneously the values of conjugate members of particular pairs of physical variables that describe the behaviour of an atomic system. According to Heisenberg, if 'E' is the value of energy measurement at time "t" of a system then in the terms of

uncertainties measureable (Δ : uncertainties symbol of the measuring variables) concept the product of uncertainties of these variables is given by

$$\Delta E. \Delta t \geq \hbar; \hbar = h / 2 \pi, h: \text{Planck's constant} = 6.55 \times 10^{-27} \text{ erg.sec} \quad (1)$$

Let us consider that measuring quantity 'O' as a symmetrical quantity for describing order of Nature and 'D' as an unsymmetrical quantity for describing disorder or randomness of Universe then if someone tries to measure the randomness quantity 'D' then Nature itself disturbs the system and alters its symmetry, which may be expressed as

$$\Delta D. \Delta O \geq \Delta \hbar \quad (2)$$

On introducing the concept of entropy (S) and probability distribution function (W) through Boltzmann relationship

$$S = k_B . \ell n W \quad (3)$$

, and entropy relationship $\Delta S = \Delta Q / T$, it follows that ΔD in terms of energy $\Delta E = k_B . \Delta T$ may be considered as³

$$\Delta D = \Delta W = f(k_B / \Delta S) \rightarrow \Delta E \quad (4)$$

If we consider Δt (time) as a small ordered quantity, then in uncertainty concept, we find that $\Delta D. \Delta O \rightarrow \Delta E. \Delta t \rightarrow \Delta \hbar$ (5)

Similarly, order and disorder, pair of conjugate quantities go together hand in hand. It is one of the beauties of Nature that some pairs of conjugate quantities such as completeness and incompleteness, creation and destruction, happiness and sorrow, life and death are similar to order and disorder. Their workings are maintained and balanced by NATURE. The moment one ceases to recognize such paired quantities, one becomes spiritual.

Sun is the main resource which supplies energy to each object in this Universe. The Sun has been orbiting around our Milky Way galaxy. - for 250 million years and controls the motion of the planets. Strictly speaking, within the context of celestial objects, the concept of temperature follows from the Sun's energy which is associated with random behaviour. The creation of universe is based on matter-energy equivalence phenomena, which follow random behavior and occur in multiple activities in form of quantum energy packets inside Sun with different radiation wave length λ , which is in turn related to energy E and temperature T as

$$E \rightarrow f(T) \rightarrow f(1/\lambda) \quad (6)$$

It is well known from the Sun's spectra that almost all of the existing elements on Earth can be identified in the Sun's atmosphere. Different atomic vibrations of these matter elements in their simplest possible form for Order-Disorder Transformations may be described by $\psi = \sin [(2 \pi / \lambda) vt] \rightarrow \Psi = \sin [(2 \pi f (T, t)]$, (7)

where $f(T,t)$ is a distribution function, which for quantum parity condition in integral space leads to Order Disorder Transformations (ODTs) equation⁴

$$\iint f(T, t) \Delta T \Delta t \approx \iint f(E, t) \Delta E \Delta t \approx (1/2 \pi) \approx \iint f(D,O) \Delta D \Delta O, \quad (8)$$

The Planck's constant 'h' denotes an elementary quantum / quantum of action, which has dimension of action (h= energy x time) . 'h' is responsible for the discrete individuality and develops dual characteristics, which is given by

$$h = [(\Delta D \Delta O) / (\iint f(D, O) \Delta D \Delta O)] = [(\Delta E \Delta t) / (\iint f(E, t) \Delta E \Delta t)] = [(h / 2 \pi) / (1 / 2 \pi)] \quad (9)$$

Many dimensional disordered /energy surface may be projected by subspace area $\Delta D \Delta O$. Thus, in certain equilibrium $h = \text{Differential area} / \text{Integral area}$, where these areas corresponds to differential and integral spaces. The probability distribution function for an atomic system may be given by

$$f(E, t) = \exp (E / \epsilon_D) \cdot \exp (- \epsilon_P / \epsilon_D) = \exp [(E - \epsilon_P) / \epsilon_D] \quad (10)$$

where according to Planck's quantum theory, photon energy $\epsilon_P = h / t$ (or $\epsilon_P \cdot t = h$). ϵ_D is disordered energy of concerning system.

4. Theory of Action: When there is continuity in the striking in forward direction and rebounding in the reverse direction of a ball from a wall under some natural laws of motion; this forms a cyclic order , i.e., the cyclic order of action or stability of Natural order develops through regularity or continuity of action, i.e., periodicity. Similarly, when there is stable mind then only state of yoga, i.e. spirituality (union of Soul with God) may be attained or one can understand Brahm [Brah (God) + Oam (Soul)], as told by Lord Krishna in Bhagwadgita. The occurrence of an Action 'A' arises from the union of energy 'E' and time 't' , i.e., the true meaning of an Action is given by $A = E \cdot t = D \cdot O$ (11)

Action in any system is an interplay between the component of Universe characteristics of random parameter 'D' and Natural characteristics of order parameter 'O' . For atomic systems, the product of energy and time has the dimensions of Planck's constant 'h'. Every small or big physical reality is complex by nature and independent from the aspect of determinism or in-determinacy. The Action occurrence and results of many renowned scientists have been visualized and reproduced earlier^{1,5}. Actions in many cases have been described here in brief.

(A) Atomic Systems:

(i) Hamilton principle of Least Action and Fermat's Principle of Least time: It is seen that humans may take risk in completing a work in less time by the use of less energy. The short cut tendencies of doing a work in humans is basically due to following two principles concerning to matter and radiation behaviour :

These two principles (a) Hamilton's Least Action Principle:

$$\delta \int p \cdot ds = 0 ; p \text{ (momentum); [least action by a body in minimum time]} \quad (12)$$

(b) Fermat's Principle of least Time:

$$\delta \int \mu \cdot ds = 0 ; \mu = c_{\text{air}} / m_{\text{medium}}; [\text{light cover minimum distance in least time}] \quad (13)$$

$$\text{Their combined form may be represented by } \delta \int f(p, \mu) \cdot ds = 0 \quad (14)$$

$$\text{This leads to uncertainty concepts } \delta \iint f(E, t) \Delta E \cdot \Delta t = 0 = \delta \iint f(D, O) \Delta D \cdot \Delta O \quad (15)$$

(ii) Bohr's Atomic Theory: Bohr considered that an electron remains in a particular orbit of definite size for a particular time without radiating energy. Breaking it, there is jumping of electrons from one orbit to other and radiating energy follows some quantum rules: Angular momentum = $I \omega = mvr = n \hbar$, i.e.,

$$\text{Rotating energy} = E_r = \frac{1}{2} I \omega^2 = \pi mvr/t \quad (16)$$

Here I is moment of inertia of moving electron in a circular orbit of radius r , n is quantum number. Photon energy $E_p = h / t$ along with above rotational energy $E_r = E_D$ by using eqs. (8) and (10) under ODTs provides the energy corresponding to n^{th} orbit, i.e., orbital energy E_o as

$$E_o = m E_n^2 e^2 / 2 \hbar^2 n^2 = ; \text{ nuclear charge } E_n = Ze \quad ; Z : \text{ Atomic no.} \quad (17)$$

$$\text{Thus for Hydrogen } (E_o)_H = (me^2 / 2 \hbar^2 n^2) \quad (18)$$

(iii) De Broglie Matter Waves: There is an intimate connection between waves and corpuscles in matter and radiation both. A moving particle of matter has always got a wave associated with it. The quantum condition of the photon radiant energy E_{pR} is described by $E_{pR} = cp = mc^2$, (19)

which is equivalent to the energy of De Broglie matter waves, E_D . Here momentum $p = mc$. c is velocity of light. By using the two energies (i) photon energy $E_p = h / t$ and (ii) De Broglie matter waves, E_D in eqs. (8) and (10), finally ODTs provides the eq. of De Broglie matter wave length.

$$\lambda = h / p \quad (20)$$

(iv) Heisenberg Uncertainty Principle: For atomic systems the minimum energy E_m ($= E'$) for the Bohr circular quantized orbital system of unit radii is the quantized energy per unit area E' . Such notion along with the energy (photon energy) of an oscillator $E_p = h / t$ and ODTs eqs. (8) and (10) establishes uncertainty equation of the form $\Delta E' \Delta t \geq \hbar$ (21)

(v) Einstein Photo- electric Effect: When radiation falls on a polished metallic surface then the ejection of photoelectrons from the metallic surface is known as Einstein Photo- electric effect. The spectrum arising from the polished surface of a metal may be understood in the terms of emission and absorption of quantum radiation in discrete quanta, each of which contains amount of energy E ($E = h \nu = p^2 / 2m$) and momentum p ($p = h \nu / c = mv$). A photon radiator produces De Broglie radiating energy E_B , as given by⁶

$$\epsilon_B = h^2 / (2 m c^2 t^2) \quad (22)$$

Photon energy ϵ_p and De Broglie radiating energy ϵ_B along with eqs. (8) and (10) under ODTs finally provides

$$h \nu = E_{\text{kinetic}} + W_f \quad (23)$$

where E_{kinetic} denotes the kinetic energy of photo- electrons and W_f is a quantity to represent the Work function. Above equation represent the Einstein Photo- electric effect.

(vi) Electromagnetic Field Conservation: In quantum field theory during the destruction and creation processes, the action occurrence of a photon of energy ϵ_p ($\epsilon_p = h / t$) and a relativistic particle of energy ϵ_o ($\epsilon_o = m_o c^2$) takes place. These two energies ϵ_p and ϵ_o along with ODTs eqs. (8) and (10) under electromagnetic approximation provides the following quantized energy conservation in an electromagnetic field¹¹

$$a_{k\lambda}^\dagger \cdot a_{k\lambda} = \hbar \quad (24)$$

where $a_{k\lambda}^\dagger$ (creation operator) and $a_{k\lambda}$ (destruction operator) correspond to the emission of a photon of energy $E - m_o c^2 = E - \hbar \omega$ and the destruction of a photon of energy $E + m_o c^2 = E + \hbar \omega$, respectively.

(vii) Planck's Quantum radiation: Action ' \dot{A} ' is a very important physical quantity as represented by

$$\text{Action} \rightarrow E \cdot t \rightarrow \dot{A} \quad (25)$$

The action occurrence of a photon in atomic systems may be represented by

$$(\text{Action})_{\text{photon}} = \epsilon_p \cdot t = \dot{A}_{\text{photon}} \rightarrow h \quad (26)$$

The photon is the quantized energy particle of light radiation and its quanta of energy may be described by

$$\epsilon_{\text{quanta}} = c p = \lambda p / t \quad (27)$$

where λ is wavelength, p is momentum and c is velocity of light. Also the average energy E average per oscillator⁸ is given by

$$E_{\text{average}} = k_B T \quad (28)$$

These two energies ϵ_{quanta} and E_{average} along with eqs. (8) and (10) under ODTs give following Planck's quantum theory of radiation

$$E = h / t = h \nu, \quad (29)$$

where ν is the frequency of radiation.

The Kinetic theory of gases and specific heats of solids were two basic phenomena which could not be explained by statistical mechanics and due to them Quantum mechanical concepts were developed. I will like to mention here that the Unified scientific theory discussed here could also explain these two aspects and which have

been discussed in the recently published book¹². Also a new theory for Geomagnetism, Evolution of Universe and Evolution of Life are not considered here.

(B) Bio- Radiation Systems (Biological and Medical Systems): Bio- systems are quite different than atomic or molecular systems. Temperature ‘T’ and time ‘t’ both governs to a Bio- system or life system. Here a human life system has been discussed. A bio-molecule and non-living material molecule differ in respect that former possess growth and consciousness. They also differ in the effects of external realities. There exist bio-radiations inside a human body system. For such a system, we considered that the quantization of bio-radiation takes place through a new quantized energy particle called as —Lifton^{8,9}- Life particle, whose energy E_q is given by:

$$E_q = E_q (T, t) = (k_B / c) (\lambda T / t) = (k_B / v) (T / t) = (e_T / t), \quad (30)$$

which possess order and disorder characteristics both. ‘ e_T ’ [$e_T = (\lambda / c) (k_B \cdot T)$] is pronounced as SYA constant. λ is wave length of radiation, k_B is Boltzmann constant. The dimension of e_T and ‘h’ is same. A theory of bio -radiation and its application have been discussed^{9,12} elsewhere. It is observed that the life particle energy, E_q is the product of the quantization factor QF ($Q_F = \lambda / c t$, say) and the average energy for each vibrational degree of freedom, $k_B T$. Theory has given good results in case of Human’s life and death systems⁷.

The mother’s womb is the natural site where a fetus develops. Fetus is the developing embryo which is formed when an ovum is fertilized by a sperm. It is likely to be mentioned that during fertilization bio-radiation develops, whose content is ‘Lifton’ – life particle. Their multiplying characteristics provide growth, which spreads in the whole body.

All living beings on earth possess same physical principles of conservation and transformation of matter and energy. The existence of earth and living things on earth depend on sun as the well known different constituents (soil, water, energy, space and air) of life have been made up largely from elements carbon, oxygen, hydrogen, nitrogen, sulphur, phosphorous, calcium, sodium, potassium and iron. Photon and lifton play dominant roles in life and death systems⁷ of living organisms. Its union with super natural power energy provides order and disorder characteristics both to a life system and death system. Life develops in a disordered state. The state of death of a life system is an ordered state, as entropy of a dead body is 0.

Bio-quantized energy particle, Lifton (Life particle) together with quantum radiation particle photon through Order – Disorder Transformations (ODTs) generates Cosmos energy E_C of the value¹²

$$E_C = (e_T / 2 \pi t) \cdot \exp (h / e_T) ; e_T = (\lambda / c) (k_B \cdot T) \quad (31)$$

where h and e_T are Planck’s and SYA constants, respectively as described above. This Cosmos energy in form of Consciousness exists in human body system. Consciousness guides human actions. All human negative activities are the

performance due to killing of Consciousness, which is generally against Nature and the cause of human's sufferings.

(C) Application of ODTs to Social Systems (Humanities): Social system (Humanities) is a very complicated system. For the first time Unified Scientific Theory is going to be applied to Social Systems (Humanities). The behaviour, mentality and thinking process of Indian people basically are responsible for set up of the Indian social system. A simple change in human mindset may bring a lot of change in society set ups. Dynamism brings changes which concerns to improvement. When something is not up to the mark it means there is need of improvement. India is a developing largest democratic country, which needs more and more improvements through its development.

(i) Disorders of Indian Social System: Some of the basic disorders which are working as constraints of Indian developments are: Population (ΔPL), pollution (Δp), poverty (Δpo), values degradation / corruption (Δv), illiteracy (Δi), materialistic culture (Δm), agriculture degradation [agricultural disorder] (Δad), human consciousness (Δc) etc. Population is the biggest harming factor as others are dependent of it. Agriculture is the only factor, whose more yields is beneficial to humans, while increment of other factors is harmful, i.e., agriculture factor effects will be in reverse order. One should be very careful with respect to these disorders in the issue of country's development. All the above seven parameters (mutually exclusive) are the functions of disorders and they are more or less interrelated to each other and affect to socio-economical development of India, i.e., the development of Indian society and Indian economy. Thus, we consider the total probability

$$D_i = [\Delta PL + \Delta p + \Delta po + \Delta v + \Delta i + \Delta m - \Delta ad] \quad (32)$$

where D_i is disorders probability. According to eq. (4) its minimum value ΔD_i may be described by

$$\Delta D_i = \Delta E_D \quad (33)$$

i.e, E_C and E_D are the forms of energies which are responsible for the development of Social systems. These two energies E_C and E_D along with eqs. (8) and (10) under ODTs provides the following

$$\iint [e^{E/E_D} \cdot e^{-E_C/E_D}] \Delta E \cdot \Delta t \approx (1/2\pi) \quad (34)$$

Which finally after using the respective values of E_C and E_D gives

$$E_{\text{development}} = E_C / 2\pi D_i \quad (35)$$

Which shows that over all development is the function of cosmos and disorders generated; i. e the development is the contribution of individual's activity efforts and disorders minimization. Population is the most affecting factor (maximum contributor of pollution) as well as agricultural growth also contributes a lot. It is noticeable that more agriculture is helpful to Indian society and economy both while other six factors increment will be harmful. The study predicts need of proper management of the

pollution ingredients. Our Indian government should be careful now about the proper management of the indicated pollution ingredients.

India needs a proper management of minimizing all types of disorders mentioned in this presentation. Also people should use their consciousness towards positive activities useful to country's development. Money can improve our economy but not to people of Indian society fully. Money is means of people's bread and butter but it can't change the mentality. There is need to revive Indian values, Indian ancient heritage and then the developed Indian economy will bring a lot of changes in Indian society. Not only this but proper governance and corruption free environment are equally responsible for the improvements of Indian society and Indian economy.

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