WHY DO ALL THE PLANETS OF OUR SOLAR SYSTEM, ELECTRONS AND NUCLEONS ETC. ALL POSSESS SPIN MOTION

Kunwar Jagdish Narain[a) b)]

All the planets of our solar system, electrons and nucleons etc. all possess spin motion. It cannot be a matter of coincidence or chance. There must positively be some purpose/reason behind it. Presently, that purpose/reason has been determined. It has also been determined how do these obtain spin motion and how does their spin motion persist. The account of the determined purpose/reason enables to give very clear and complete explanation of all the phenomena and properties related with spinning particles/bodies, including numerous such phenomena and properties etc. too which could not have been explained yet. For example: 1. Despite moving in spherically symmetric field, how do all the planets of our solar system and orbiting electrons acquire elliptical orbits? 2. What is source/cause that keeps these going on spinning and moving in their elliptical orbits continuously, where their paths are not happened to be equipotential because of being elliptical? 3. How do their energy, momentum, spin angular momentum etc. conserve because when these move along their elliptical orbital paths, their velocity varies?

[a)] kjnarain@yahoo.co.in ; kjnarain@hotmail.com
[b)] Former address: Physics Department, Govt. Bilasa Girls P.G. (Autonomous) College, Bilaspur (C.G.) 495001, INDIA

1. INTRODUCTION

We know that all the planets of our solar system, electrons and nucleons etc. all possess spin motion. It cannot be a matter of coincidence or chance. There must positively be some purpose or reason behind it and that should be determined. But that has not been determined yet. Consequently, there are numerous very important phenomena and properties etc. related with spinning particles/bodies which could not have been explained yet. For example: 1. Despite moving in spherically symmetric field, how do all the planets of our solar system and orbiting electrons acquire elliptical orbits? 2. What is source/cause that keeps these going on spinning and moving in their elliptical orbits continuously, where their paths are not happened to be equipotential because of being elliptical? 3. How do their energy, momentum, spin angular momentum etc. conserve because when these move along their elliptical orbital paths, their velocity varies? And the phenomena and properties etc. those have been explained, if we go through their explanations, no doubt there are found rigorous mathematical proofs, but if we go through their rigorous mathematical proofs closely and intently, we find numerous assumptions those have been chosen in order to explain the phenomena. These assumptions have been chosen merely keeping in view that these suits to the required demands and may give the desired results. No thinking has been focused over whether these are logically and/or practically possible or not. Consequently these give rise to numerous very basic and fundamental questions and negative consequences. In order to justify the chosen assumptions and to avoid/counter the negative consequences, several assumptions have further been taken. But these too are not true because these too give rise to

numerous very serious and fundamental questions. The taken assumptions cannot be avoided otherwise the desired results cannot be obtained. For example:

1. The current interpretation of quantum (see Sec. 2.1, Ref. 1) has been given keeping in view that it suits to all the requirements and may explain all the phenomena including the phenomena of interference and diffraction of photons and electrons. But no thinking has been focused over whether this interpretation is logically and/or practically possible or not. Consequently, this interpretation gives rise to numerous very serious basic and fundamental questions (see Sec. 2.1.1, Ref. 1), and to several negative consequences (see Sec. 2.1.2, Ref. 1). In order to justify the given interpretation and to avoid/counter the negative consequences, an assumption/solution has been proposed (see Sec. 2.1.3, Ref. 1) but that too is not true and gives rise to numerous very basic and fundamental questions (see Sec. 2.1.3, Ref. 1). The taken assumptions cannot be avoided otherwise the current interpretation of photon fails to give the desired results.

2. If we examine the BCS (Bardeen–Cooper–Schrieffer) theory[2] of superconductivity and its rigorous mathematical proofs to explain the related different properties closely and intently, we find that it is based on such concepts which are practically not possible and contradict two well-observed facts too (see Sec. 6, Ref. 3). These concepts have been chosen keeping in view that these may give the desired results. No thinking has been focused over whether these are logically and/or practically possible or not. Consequently these concepts give rise to numerous very basic and fundamental questions (see Sec. 6, Ref. 3). But instead of realizing the truth, several assumptions have further been taken in

order to justify the chosen concepts (see Sec. 6, Ref. 3). These assumptions too are not true and give rise to numerous more very basic and fundamental questions (see Sec. 6, Ref. 3). Most importantly, the taken assumptions cannot be avoided otherwise the BCS theory fails to give the desired results

Presently, that purpose/reason as to why all the planets of our solar system, electrons and nucleons etc. all possess spin motion has been determined (see Sec. 2). It has also been determined as to how these possess spin motion and how their spin motion persists (see Sec. 3)

The account of the determined purpose/reason enables to give very clear and complete explanation of all the phenomena and properties related with spinning particles/bodies, e.g., spectroscopic phenomena (see Sec. 4.1.1); quantum mechanical phenomena (see Sec. 4.1.2); phenomena of interference and diffraction of photons and electrons (see Sec. 4.1.3); relativistic phenomena (see Sec. 4.1.4); electromagnetism and related phenomena, properties etc. (see Sec. 4.2.1); superconductivity and related phenomena, properties and effects etc. (see Sec. 4.2.2); nuclear phenomena, properties and structures etc. (see Sec. 4.2.3).

2. DETERMINATION OF WHY DO ALL THE PLANETS OF OUR SOLAR SYSTEM, ELECTRONS AND NUCLEONS ETC. ALL POSSESS SPIN MOTION

The spin motion of every particle/body actually generates two greatly important properties in it (see Sec. 2.1). And hence in all the planets, electrons and nucleons etc

these properties are generated. How much important these two generated properties are, see Sects. 4.1 and 4.2.

If the spinning particles possess magnetism, e.g. electrons, protons, neutrons etc., the generated two properties in these, enable these to create such situation that due to interaction between their magnetic fields, a short range, charge independent and very strong force is generated between these (see Sec. 2.2). This generated force has both the components attractive and repulsive. How much important this generated force is, see Sects. 2.2 and 4.2.

2.1. The properties which are generated in particles due to their spin motion

The following two properties are generated in particles due to their spin motion.

2.1.1 First property

The spin motion of every particle generates the tendency of linear motion in it along the direction of its spin angular momentum L_S (for verification of its truth, see Sec. I B, Ref. 4). Consequently, every spinning particle, e.g. electron, nucleon etc. possesses direction of its linear motion. By some means, e.g. applying some external force like electric or magnetic field on electrons, protons etc, if the particles are made able to move, the directions of L_S of the particles are oriented and aligned in the direction according to Lorentz force and then those start moving along the directions of their respective L_S (for confirmation that the directions of L_S of the particles are

oriented and aligned if electric or magnetic field is applied across them, see Sec. 4.4, Ref. 5 and also Sec. 5.4.1, Ref. 3).

2.1.2 Second property

If the frequency of spin motion of particle increases by some means, a stage comes when the particle starts moving itself along the direction of its L_S. Then, as the frequency of spin motion of particle increases, the velocity of particle, e.g., electron, proton etc. goes on increasing in accordance to expression

$$\mathrm{v}^2 = h\omega / m \quad \text{...} \quad (1)$$

[where m, v and ω respectively are the mass, linear velocity and frequency of spin motion of particle and h is Planck's constant. For verification of the truth of expression (1), see Sec. I A, Ref. 4].

Due to spin motion, the particle obtains spin energy ($E_s = h\omega/2$, for detail, see Sec. II, Ref. 4) and spin momentum ($p_S = h\omega/\mathrm{v}$, for detail, see Sec. II, Ref. 4) similarly as it obtains linear momentum (p_{lin}) corresponding to its kinetic energy (E_k). For verification of the truth of p_S, we can see Sec. I C, Ref. 4, and also the example of photons, where $h\nu/c$, which is currently defined as momentum of photons, is in fact p_S of photons (for its confirmation and detail information, see Sec. 2.2, Ref. 1). Spin momentum of photon ($p_S = h\nu/c$) is generated due to spin motion of photons which

they derive from the orbiting electrons from which they are emitted (for confirmation of its truth, see Sec. I A, Ref. 4).

Therefore, the particles possessing linear motion together with their spin motion, they possess motional energy (E_m) = $E_k + E_s$, and motional momentum (p_m) = $p_{\text{lin}} + p_S$, and whenever comes the situation of conservation of energy and momentum of such particle (i.e. possessing spin motion along with its linear motion), E_m and p_m of particle actually conserve, not its E_k and p_{lin} (for verification of the truth of conservation of p_m , see Sec. I D, Ref. 4).

2.2. The force that is generated between the spinning particles possessing magnetism

If the spinning particles possess magnetism, e.g. electrons, protons, neutrons etc., the generated two properties in them, enable them to create such situation that due to interaction between their magnetic fields, a short range, charge independent and very strong force is generated between them. This generated force has both the components attractive and repulsive, and it depends upon the situation created by the interacting particles accordingly attractive or repulsive component comes into play.

How the attractive force is generated between the spinning particles possessing magnetism, e.g., between two electrons, see Sec. 4.1, Ref. 6. The magnitude of the generated force varies as the distance between the interacting particles varies (see Sec. 6.1, Ref. 6). Due to this force, electrons, protons, neutrons etc. are all held bound together in their respective beams against the repulsive Coulomb force between them.

How these particles (e.g. electrons) are held bound together in their respective beams, see Sec. 5, Ref. 6. In neutron beams too, the same short range, charge independent and very strong force is generated between neutrons which keeps them held bound together. But the neutron beams do not survive even as long as the electron and proton beams survive while in neutron beams, no repulsive Coulomb force comes into play between neutrons. It happens because in neutron beams, after their (neutron) mean life time (about 15 minutes) they start decaying and consequently the beam is destroyed.

Due to interaction between magnetic fields of electrons, electromagnetism (diamagnetism) and magnetic field too are generated in the beam and around the beam respectively, see Sec. 5, Ref. 6. The generated magnetic field around the beam possesses anticlockwise direction (if the motion of the beam is towards the face of the clock) and occurs in plane perpendicular to the direction of motion of the beam; see Sec. 5, Ref. 6. In existence, no explanation is so far available as to: 1. Why and how electrons, protons etc., are held together in their respective beams despite having repulsive Coulomb force between them; 2. How magnetic field is generated in a plane perpendicular to the direction of motion of beam and how that field possesses direction (anticlockwise); 3. How and which type of magnetism is generated in the beam.

The attractive component of the generated force between nucleons enables to give almost a complete understanding about the structures, properties etc. of deuterons, alpha particles and nuclei (for detail, see Sec. 4, 5, 6, 7, 8 and 9, Ref. 7).

How the repulsive force is generated between the spinning particles possessing magnetism, e.g., between two electrons, see Sec. 4.2, Ref. 6. The magnitude of the

generated force varies as the distance between the interacting particles varies (see Sec. 6.2, Ref. 6).

The repulsive component of the generated force between nucleons enables to give the complete knowledge as to how the emission of alpha (α) and beta (β) particles takes place from nuclei (for detail, see Sec. 9.2, Ref. 7).

Currently, according to Yukawa's meson field theory[8], a field of virtual π mesons is assumed in nuclei and the continuous exchange of π mesons between nucleons is assumed as the cause of origin of nuclear force. But it gives rise to numerous very fundamental questions. For example: Virtual means which does not exist physically, then how can the field of such (i.e. virtual) π mesons occur? How can such π mesons possess charge, that too positive or negative? Further, the real π mesons possess both charge and mass, while to virtual π mesons, only charge has been assigned, mass has not been assigned. Why is this double standard? Furthermore, as far as the author's knowledge is concerned, it is believed that there exist only matter and energy in the universe, which are inter-convertible, in which category do the virtual π mesons lay?

Secondly, does the field of virtual π mesons occur in electron, proton and alpha particle (α) beams and they are held together against the repulsive Coulomb force in their respective beams due the continuous exchange of virtual π mesons between them? If not, then how are they held together in their respective beams against the repulsive Coulomb force between them? And if yes, then:

1. The field of virtual π mesons should occur in electron beams too and due to the exchange of π mesons between electrons, the electrons should be held together in

their beams. Does it happen so? If not, then how are the electrons held together in their beams?

2. The neutron beams should exist in nature similarly as deuterons, α particles and nuclei exist in nature, and even with more strong stability. Because in neutron beams, there occur no protons and hence no repulsive Coulomb force comes into play. But the fact is just reverse of it. The neutron beams do not survive even as long as the proton beams survive. Here some people may argue that it happens because neutrons start decaying after their mean life time and consequently neutron beams are destroyed. This argument is true but it gives rise to questions: Then why and how do neutrons not decay in nuclei where due to the presence of protons, the repulsive Coulomb force also comes into play? What does happen with the presence of protons in nuclei or what do the protons do in nuclei such that the neutrons of nuclei stop decaying and they become stable? For example, the presence of one proton in deuteron (D) makes the neutron of D stable (see Sec. 4.1, Ref. 7). If one more proton is added in D, the resultant system (i.e. He^3) becomes more stable. But instead of adding one proton, if one more neutron is added in D, though the binding energy per nucleon of the resultant system (i.e. H^3) is increased in comparison to that of the system He^3 but the system (i.e. H^3) becomes unstable and decays into He^3 through β decay. Despite $(E_b)_{H^3} > (E_b)_{He^3}$ [where $(E_b)_{H^3}$ is the binding energy per nucleon in the nucleus of H^3 and $(E_b)_{He^3}$ is the binding energy per nucleon in the nucleus of He^3], why and how does H^3 decays into He^3 (see Sec. 5, Ref. 7)? Further, if one neutron is added in He^3 or one proton in H^3, the resultant system (i.e. α particle) becomes so strongly stable that it starts behaving like

a particle. While if one proton is added in He^3 or one neutron in H^3, the resultant systems, i.e. isotope Li^4 (half life time = 9.1×10^{-23} s) and the synthesized isotope H^4 (half time = =1.39$\times\ 10^{-22}$ s) respectively become extremely unstable. The isotope Li^4 is though found in nature but the isotope H^4 is not found in nature. It is obtained by synthesis (see Sec. 5, Ref. 7).

In existence, no explanation is found of any of the above questions. The presently determined force gives very clear and complete explanation of all the above questions (see Sects. 4 and 5, Ref. 7).

3. DETERMINATION OF HOW DO ALL THE PLANETS OF OUR SOLAR SYSTEM, ELECTRONS AND NUCLEONS ETC. ALL POSSESS PERSISTENT SPIN MOTION

Presently, for electrons, protons, neutrons etc. it has been determined as to how these possess spin motion and how their spin motion persists while these do not have any source or reservoir of infinite energy for their persistent spin motion.

3.1 How electrons possess persistent spin motion

The current concept that due to spin motion of charge of electrons, electrons possess magnetism, magnetic field and spin magnetic moment (μ_s), is not true (for its confirmation, see Sec. 1, Ref. 5). The electrons possess a bundle of magnetism by the virtue of nature similarly as they possess a bundle of charge (– e) by the virtue of nature. The magnetism occurs in the form of a circular ring round the charge of electron which occurs in the form of a ball (for detail, see Sec. 2, Ref. 5).

When the electron possesses charge and magnetism both, obviously their fields should interact, i.e. electromagnetic interaction. But, since the charge and magnetism of electron exist together and these are not repelled by each other, the interaction between their fields should be attractive. The attractive type of interaction between their fields can be possible if both the charge and magnetism of electron spin, but in directions opposite to each other. And due to their spin motion, electron obtains electric and magnetic moments respectively which lie along the directions of their respective spin angular momentum, because then magnetic and electric moments of electron shall lie in directions opposite to each other. [Over the concept of electric moment of electron, some people may express doubt, because in existence, there is no evidence of its occurrence. But its occurrence cannot be ruled out. There may be some cause due to which it could not have been observed yet. Somehow, determining that cause if it is tried to determine, it can be determined.]

The above assumptions cannot be ruled out because we observe that when two bar magnets are placed parallel to each other, one upon the other with their magnetic moments in directions opposite to each other, the interaction between their magnetic fields happens to be attractive and the magnetism of both the bar magnets do not decay but remain intact. In the case of electrons too, no decay in their charge and magnetism takes place and these remain intact.

The interaction between the field of charge and the field of magnetism of electron keeps the charge and magnetism of electron spinning persistently.

The magnetic moment arises due to spin motion of magnetism of electron and lies along the direction of spin angular momentum of magnetism of electron, happens to be μ_s, currently defined as spin magnetic moment of electron.

The frequencies of spin motion of the ball of charge (ω_{EC}) and the ring of magnetism (ω_{EM}) of electron are happened to be such that the generated spin angular momentum (L_{SC}) and the generated linear velocity (v_{EC}) in the charge of electron along the direction of its L_{SC} are greater than the generated spin angular momentum (L_{SM}) and the generated linear velocity (v_{EM}) in the magnetism of electron along the direction of its L_{SM}, i.e. $L_{SC} > L_{SM}$ and $\mathrm{v}_{EC} > \mathrm{v}_{EM}$. (The velocities v_{EC} and v_{EM} in the ball of charge and the ring of magnetism respectively are generated because of generation of two properties in them due to their spin motion, see Sec. 2.) The spin angular momentum L_S, which the electron as whole possesses, happens to be the resultant of L_{SC} and L_{SM}, i.e. $L_S = L_{SC} - L_{SM}$. Consequently, the electron possesses linear velocity v_E along the direction of its L_S and the magnitude and direction of its v_E vary as the frequencies of spin motion ω_{EC} and ω_{EM} vary. The frequency ω_E corresponding to the resultant spin angular momentum L_S, can be said to be the frequency of spin motion of electron.

Further, since μ_s occurs along the direction of L_{SM} and the electron possesses its linear velocity v_E along the direction of its L_S which (v_E) lies along L_{SC}, μ_s lies in direction opposite to the direction of L_S because L_{SC} and L_{SM} lie in directions opposite to each other.

3.2 How protons possess persistent spin motion

The protons too possess magnetism by the virtue of nature similarly as electrons possess, and it occurs in the form of a circular ring round the charge of proton which occurs in the form of a ball. In the case of proton, since its mass happens to be much greater despite having the same amount of charge ($+e$) as the electron possesses ($-e$), only the sign of charge is being changed, the ball probably possesses some material or something other than charge too in addition to charge ($+e$). The ball of charge and magnetism of proton too spin in directions opposite to each other similarly as occurs in the case of electron. And the interaction between the fields of charge and magnetism of proton keeps the charge and magnetism of proton going on spinning persistently.

The term μ_s, currently defined as spin magnetic moment of proton, arises due to spin motion of magnetism of proton and occurs along the direction of its spin angular momentum (L_{SM}).

The frequencies of spin motion of the ball of charge (ω_{PC}) and of the ring of magnetism (ω_{PM}) of proton are happened to be such that the generated spin angular momentum (L_{SC}) and linear velocity (v_{PC}) in the charge of proton along the direction of its L_{SC} are greater than the generated spin angular momentum (L_{SM}) and linear velocity (v_{PM}) in the magnetism of proton along the direction of its L_{SM}, i.e. $L_{SC} > L_{SM}$ and $\mathrm{v}_{PC} > \mathrm{v}_{PM}$. The spin angular momentum L_S, which the proton as whole possesses, happens to be the resultant of L_{SC} and L_{SM}, i.e. $L_S = L_{SC} - L_{SM}$. Consequently,

proton possesses linear velocity v_P along the direction of its L_S and the magnitude and direction of its v_P vary as the frequencies of spin motion ω_{PC} and ω_{PM} vary. The frequency ω_P corresponding to the resultant spin angular momentum L_S, can be said to be the frequency of spin motion of proton.

Further, since the magnetism of proton possesses magnetic moment (μ_s) along the direction of its L_{SM} and the proton possesses its linear velocity along the direction of its L_S which lies along L_{SC}, the proton possesses magnetic moment (μ_s) in the direction opposite to the direction of its L_S because L_{SC} and L_{SM} lie in directions opposite to each other.

3.3 How neutrons possess persistent spin motion

How neutrons possess spin motion, see the neutron model (Sec. 2, Ref. 9).

3.4 How photons possess persistent spin motion

The frequency ν, which is currently defined as frequency of the wave nature of photons, is in fact the frequency of their spin motion. How and from where do the photons obtain their spin motion, see Sec. 2.2, Ref. 1.

3.5 Importance of concepts taken in determination of as to how electrons, nucleons etc. all possess persistent spin motion

The present concept of spin motion of charge and magnetism of electron and proton in directions opposite to each other etc. is though hard to accept but cannot be ruled out because: i. The arguments given to justify the present concept cannot be ruled

out. Ii. The present concept enables to resolve numerous mysterious but very important problems, e.g.:

1. Why and how neutron survives for about 15 minutes (mean life time of neutron) and then decays, while the rest of all the unstable elementary particles decay within fraction of second (see sec. 3.2, Ref. 9).
2. Why and how neutron has unstable and stable both the states, while the rest of all the elementary particles have only one state, either stable or unstable (see Sec. 3.3, Ref. 9).
3. Why neutron happens to be unstable in its free state, and how it becomes stable in systems, deuterons, α particles, and stable nuclei (see Sects. 4, 5, 6, Ref. 7).
4. How neutron possesses magnetic moment = - 0.00966236×10^{-24} J/T (see Sec. 3.4, Ref. 9).
5. While it is believed that the electrons do not reside inside the nuclei, then why and how the electrons are emitted from the nuclei during β decay (see Sec. 3.6, Ref. 9).
6. Why and how energy of the emitted β particles varies in the form of a continuous energy spectrum (see Sec. 3.7, Ref. 9).
7. Why and how neutrons have high penetrating power and distinguishable low and high-energy ranges (see Sects. 3.8 and 3.9, Ref. 9).
8. The reality of anti-particles, i.e. what these are actually and how these are produced. From where these are produced is known but how these are produced is yet not known. (Its complete information shall be given very shortly.)

4. IMPORTANCE OF THE ACCOUNTS OF THE GENERATED TWO PROPERTIES AND THE GENERATED FORCE

4.1 Importance of the account of the generated two properties

The account of the generated two properties in orbiting electrons: 1. Resolves all the three very important but so far unresolved problems mentioned above in Sec. 1 (see Sects. III C and J, Ref. 4). 2. Enables to give a complete explanation of all the phenomena of spectroscopy, that too very clearly as to how these phenomena take place (see Sec. 4.1.1). 3. Enables to explain several such phenomena/events too which could not have been explained yet (see Sec. 4.1.1)

The account of two properties generated in free electrons, nucleons, photons etc. enables to explain all the phenomena, e.g., quantum mechanical phenomena (see Sec. 4.1.2), the phenomena of interference and diffraction of photons and electrons (see Sec. 4.1.3) and the relativistic phenomena (see Sec. 4.1.4).

4.1.1 Explanation of spectroscopic phenomena

4.1.1 (a) Present explanation (i.e. taking account of the generated two properties in orbiting electrons**)**

The account of the generated two properties in orbiting electrons enables to give very clear and complete explanation of almost all the main phenomena/events of spectroscopy [see from Sec. III B to Sec. III L, Ref. 4]. For example, it enables to:

1. Deduce the expressions both for frequency of spectral lines (see Sec. III E, Ref. 4) and for intensity of spectral lines (see Sec. III F, Ref. 4);

2. Explain how and why the intensity of spectral lines decreases as their frequency increases (see Sec. III H, Ref. 4), and how and why the thickness of spectral lines decreases as their order increases (see Sec. III L, Ref. 4);

3. Give very clear and complete picture of why and how the fine structures of spectral lines are obtained (see Sects. III I and J, Ref. 4);

4. Deduce the expressions for number of fine lines in different spectral lines, for their frequency and intensity (see Sec. III K, Ref. 4).

The account of the generated two properties of the orbiting electrons enables to give very clear and complete picture of several such phenomena/events too which are equally important but their no explanations are yet available. The existing theories fail to explain these phenomena/events. For example:

1. How the radiation energy is emitted from the orbiting electrons in the form of bundles (quanta) which behave like a particles, and how these bundles obtain energy $h\nu$ (see Sec. III B, Ref. 4);
2. Why and how in atomic spectra of hydrogen atom, there are found several series of spectral lines, e.g., Lyman series, Balmer series, Paschen series etc., not a single series (see Sec. III D, Ref. 4);
3. How and why the orbiting electrons acquire elliptical orbits despite moving in spherically symmetric field (see Sec. III C, Ref. 4). [The orbiting electrons move actually in elliptical orbits (as all the planets of our solar system move in elliptical orbits) not in circular orbits. The Bohr's theory fails to explain accurately the frequency of higher order spectral lines of every series (Lyman series, Balmer series

etc.) because in this theory, the motion of electrons has been assumed in circular orbits. Somehow, if assuming the elliptical orbits for the orbiting electrons, the expression for the frequency of spectral lines is deduced, that shall explain accurately the frequency of higher order spectral lines of every series.]

4.1.1 (b) Current explanation, and faults in it

The current theories enable to deduce the expression for frequency of spectral lines but fail to deduce the expression for intensity of spectral lines. The current theories fail to explain the decrease in intensity of spectral lines as their frequency increases; decrease in thickness of spectral lines as their order increases and many more phenomena/events

Regarding explanation of fine structure of spectral lines, the existing explanation (given by current theories) has three very basic and fundamental faults: 1. The determination of μ_j is neither judicious nor meaningful (for detail, see Sec. 1, Ref. 5); 2. The expression L_j = jh /2π is not true; 3. j (= s $\pm$ l) can have only one value corresponding to each value of l, not more than one value (for detail, see Sec. 1, Ref. 5). Therefore, the existing explanation of fine structure of spectral lines cannot be set forth to be true.

Secondly, the theories existing to explain the fine structure of spectral lines fail to explain as to why and how the fine structures of spectral lines are obtained. These theories somehow manage to give only the number of fine lines, that too adopting very complicated and tedious procedure of assigning number of sub-energy states corresponding to different energy states of electron and putting some selection rules for

the occurrence of its transition among those. If we look at the procedure followed in these theories to explain the fine structure of spectral lines in different cases, we find that those are not capable even to give the exact number of fine lines, and in order to explain it, further interpretations have been presented [for detail, see starting from the last paragraph (column-1, page-66) to paragraph-4 (column-2, page-66) of Sec. III M, Ref. 4].

4.1.2 Explanation of quantum mechanical phenomena

How the account of the generated two properties enables to explain the quantum mechanical phenomena, let us take, e.g., the phenomenon, transmittance T = finite for particles possessing energy $E < V_0$, where V_0 is energy of the potential barrier [see Sec. 4.1.2 (a)]. The current explanation of the phenomenon, T = finite for particles possessing energy $E < V_0$, where the wave nature of particles has been assumed instead of taking the account of two properties generated in them due to their spin motion, has also been discussed [see Sec. 4.1.2 (b)].

4.1.2 (a) Present explanation (i.e. taking account of the generated two properties in particles**) of the phenomenon, transmittance T = finite for particles possessing energy** $E < V_0$

Since all the quantum mechanical particles possess spin motion, obviously they possess spin energy (E_s). And hence their total energy E should be $= E_k + E_s = E_m$, not equal to E_k. Then their total energy E ($= E_m$) should be $> E_k$, and it may be > V_0. Consequently the particle penetrates into the barrier, i.e. T = finite is obtained.

Actually, for penetration of any particle into/through a potential barrier, it is necessary that the particle possesses momentum, and the magnitude of momentum should be such that the energy of particle corresponding to this momentum is greater than the energy of the potential barrier. Since the spin motion of particle generates spin momentum (p_s) and E_s both in it, the momentum of the particle is also increased from p_{lin} to p_m (= $p_{lin} + p_s$) in addition to increase in its energy from E_k to E_m (= $E_k + E_s$). Therefore the particle succeeds to penetrate into/through the barrier and T = finite is obtained (for detail, see Sec. II, Ref. 4).

4.1.2 (b) Current explanation (i.e. assuming wave nature of particles**), and faults in it**

In the current explanation, it is claimed that the property of barrier penetration is entirely due to the wave nature of particles and is very similar to the total internal reflection of light waves. If two glass plates are placed close to each other with a film of air as medium between them, some light is transmitted from one plate to another even though the angle of incidence is greater than the critical angle. But, in the case of transmittance of light through the air film, some light is transmitted even though the angle of incidence is greater than the critical angle, while in the case of transmittance of matter particles through the potential barrier, T = finite is obtained even though their energy $E < V_0$, how can these be similar? In the case of transmittance of matter particles, we are talking about the dependence of their transmittance over their energy while in the case of transmittance of light, we are talking about the dependence of their transmittance over their angle of incidence, how can these be compared?

The claim that the intensity of transmitted light decreases exponentially with increase in thickness of the air film, similarly as T decreases exponentially with increase in thickness of potential barrier (as obtained in the mathematical treatment of explanation of T = finite) can of course be accepted. But it does not approve the claim that the property of barrier penetration is entirely due to the wave nature of particles. Because:

1. Does the wave nature of particles generate momentum in them and increase their momentum to p'($> p_{lin}$) such that the energy corresponding to this momentum (i.e. p') is greater than the energy V_0 of the potential barrier? Otherwise, the particles cannot penetrate through the barrier, i.e. T = finite for particles $E < V_0$ cannot be obtained.
2. To explain the phenomenon of photoelectric effect, in order that the photons may penetrate into the metals, energy $h\nu$ and momentum $h\nu / c$ have been associated with photons, while to explain T = finite for particles $E < V_0$, it is claimed that this phenomenon occurs due to the wave nature of particles. It is amazing.
3. The assumption of wave nature of particles is not true [see Sects. 2.1.1 (b) and 3, Ref. 1], and the phenomena of interference and diffraction of photons and electrons, in order to explain which the wave nature of particles has been assumed, take place due to their particle nature (see Sects. 4.1, 4.2, 4.3, Ref. 1), not due to their wave nature.

4.1.3 Explanation of the phenomena of interference and diffraction of photons and electrons

4.1.3 (a) Present explanation (i.e. taking account of the generated two properties in electrons and photons**)**

The account of the generated two properties of photons enables to give very clear and complete explanation of as to why and how the phenomena of their interference and diffraction take place.

4.1.3(a1) Explanation of the phenomenon of interference

1. For the explanation of the phenomenon when the source of light is monochromatic, see Sects. 4.2.1, and 4.2.3, Ref. 1.

2. For the explanation of the phenomenon when the source of light is non-monochromatic, say of white light, see Sec. 4.2.2, Ref. 1.

4.1.3(a2) Explanation of the phenomenon of diffraction

I. Diffraction at straight edge

i. For the explanation of why and how the intensity falls off continuously and rapidly as we move into the geometrical shadow until complete darkness is reached, see Sec 4.3.1 (a), Ref. 1.

ii. For the explanation of why and how bright and dark bands are obtained outside the geometrical shadow, see Sec. 4.3.1(b), Ref. 1.

iii. For the explanation of why and how the intensity and the width of bright bands go on reducing as their order increases, see Sec. 4.3.1(b1), Ref. 1.

iv. For the explanation of why and how each bright band is separated by a dark band and the darkness of the dark bands goes on reducing as their order increases, see Sec. 4.3.1(b2), Ref. 1.

II. Diffraction at a thin wire

1. For the explanation of why and how interference fringes are obtained inside the geometrical shadow of the wire, see Sec. 4.3.2, Ref. 1.

2. For the explanation of why and how the diffraction bands of decreasing intensity and width are obtained on both sides of the limits of the geometrical shadow similar to those as are obtained outside the limit of straight edge, see Sec. 4.3.2, Ref. 1.

3. For the explanation of why and how the interference fringes inside the geometrical shadow are disappeared when the wire happens to be thick, see Sec. 4.3.2, Ref. 1.

III. Diffraction at a single slit

For the explanation of why and how very intense and wide central band is obtained, and on both sides of it, few bands of very rapidly decreasing intensity are obtained; see Sec. 4.3.3, Ref. 1.

4.1.3 (b) Current explanation (i.e. assuming wave nature of photons and electrons**), and faults in it**

In the current explanation:

1. The current interpretation of photon is faulty and incomplete; see Sec. 2.1.1, Ref.1.

2. The assumption of wave nature of photons and electrons is not true, see Sects. 2.1.1(b), 3.1 and 3.4, Ref. 1.

3. The expression of de Broglie wavelength is faulty, see Sec. 3.2, Ref. 1.

4. In the explanation of the phenomena of interference and diffraction, there are very basic and fundamental faults; see Sec. 3.3, Ref. 1.

4.1.4 Explanation of relativistic phenomena

How the account of the generated two properties enables to explain the relativistic phenomena, let us take, e.g., the phenomenon, the variation of velocity of electrons accelerated by a large voltage with their kinetic energy [see Sec. 4.1.4 (a)]. The current explanation of the above phenomenon has also been discussed [see Sec. 4.1.4 (b)], where instead of taking the account of the generated two properties, it has been assumed that when the electrons are accelerated by a large voltage and the rate of increase in their velocity starts decreasing after attaining relativistic velocity by them, the mass of electrons starts increasing in order to conserve their E_k and p_{lin}.

4.1.4 (a) Present explanation (i.e. taking account of the generated two properties in electrons**) of phenomenon, the variation of velocity of electrons with their kinetic energy**

When the electrons are accelerated by a large voltage up to $15\times10^6 V$ (Bertozzi's experiment[10]) and the rate of increase in their velocity (v) starts decreasing after attaining relativistic velocity by them, their mass does not start increasing in order to conserve their E_k and p_{lin}. Instead the rate of increase in frequency of spin motion of

electrons (ω) starts increasing in order to conserve E_m, p_m, and L_s of electrons. Because electrons possess E_m, p_m, L_s and hence E_m, p_m, L_s of electrons should be conserved (for detail, see Sec. IV C, Ref. 4). [How L_s, E_m, and p_m of electrons are conserved, see Sec. 4.1.2(a1), and for evidence to verify that the rate of increase in ω of electrons starts increasing in order to conserve E_m and p_m of electrons, see Sec. IV C 1, Ref. 4.] How the expressions for relativistic energy $E_k = [m_e c^2 / \sqrt{(1 - \mathrm{v}^2 / c^2)}] - m_e c^2$ and relativistic momentum $p_{lin} = m_e \mathrm{v} / \sqrt{(1 - \mathrm{v}^2 / c^2)}$ are obtained as the consequence of increase in the rate of increase in ω of electrons, see the portion starting from the second paragraph (i.e. from line-11), column-1, to first paragraph (which comes after eqn. 4.24), column-2, page-70, Sec. IV C, Ref. 4.

After attaining relativistic velocity by the electrons when the rate of increase in their ω starts increasing, the variation between their v and ω does not take place according to $m_e \mathrm{v}^2 = h\omega$ but that is changed. (The variation between v and ω of electrons does not take place according to $m_e \mathrm{v}^2 = h\omega$ also when they move in their elliptical orbits, but that is changed; see Sec. III C, Ref. 4.) The changed form has yet not been determined but under way of determination.

4.1.4 (a1) Explanation of how L_s, E_m and p_m of electrons conserve

When ω of electron increases as its v increases, the increase in ω of electron is caused due to shrink in its size, i.e. due to decrease in its volume. Because, when the volume of electron is decreased, obviously its radius (r) is reduced and that causes decrease in its moment of inertia I (= $m_e r^2$). The decrease in I of electron causes

decrease in L_s (= $I\,d\theta/dt$, where $d\theta/dt$ is the angular velocity of its spin motion) of electron. Therefore, in order to conserve L_s of electron, $d\theta/dt$ of electron is increased and that causes increase in ω of electron. The increase in ω of electrons causes increase in E_s and p_s of electrons, and that (i.e. increase in E_s and p_s of electrons) conserve respectively their E_m and p_m.

The concept of shrink of electron in its size cannot be ruled out, because protons, which are particles like electrons, shrink in size[11]. Secondly, we observe that, as we proceed towards the photons of frequencies (ν) higher than the photons of visible region, the power of penetration of photons starts increasing and its rate goes on increasing. No doubt, as their ν increases, their momentum ($h\nu/c$) increase and consequently their power of penetration increases, but the rate of increase in their power of penetration happens to be probably faster. It happens because as ν of photons increases, their size shrinks and that increases the rate of increase in their power of penetration.

4.1.4 (b) Current explanation (i.e. assuming that after attaining relativistic velocity by the electrons, their mass starts increasing in order to conserve their E_k and p_{lin} **), and faults in it**

Currently it is assumed that when the electrons are accelerated by a large voltage up to $15\times10^6 V$ and the rate of increase in their v starts decreasing after attaining relativistic velocity by them, their mass starts increasing in accordance to expression $m_{mov} = m_e / \sqrt{(1-\mathrm{v}^2/c^2)}$ (where m_{mov} and m_e respectively are the moving and

rest mass of electron, and c is velocity of light) in order to conserve their E_k and p_{lin}. But this assumption is not true because it gives rise to several very fundamental questions. For example:

i. Since the electron possesses spin motion, it should possess E_m, p_m, and L_s. And further, since the frequency (ω) of spin motion of electron varies with its velocity (v), E_m, p_m and L_s of electron should conserve, not its E_k and p_{lin}, when, after attaining relativistic velocity by it, the rate of increase in its v starts decreasing. Do E_m, p_m, L_s of electron conserve? And if conserve, how?

ii. The evidence we have from experiments, proving the existence of electrons, suggests an indivisible entity having definite quantities associated with it: e and m_e. Then how can m_e increase? Here it can be argued that when the rate of increase in v of electron starts decreasing, it's moving mass increases, not it's rest mass m_e. But this argument cannot be accepted because it gives rise to several very basic questions of which no explanation can be given. For example: What moving mass actually is? What is its physical interpretation?

The expression $m_{mov} = m_e / \sqrt{(1 - \mathrm{v}^2 / c^2)}$ is true, but in this expression, m_{mov} is not the moving mass. It is actually the effective mass generated due to spin motion of electrons. How the spin motion of electrons generates effective mass in them, in order to understand it clearly, let us consider the expressions of momentum and energy of electron $p_m = p_{lin} + p_s$ and $E_m = E_k + E_s$ respectively (see Sec. 2.1.2). In these expressions, if superposing the effects of p_s and E_s of electron on its p_{lin} (= m_ev) and

E_k (= $m_e v^2/2$) respectively we try to write down the expressions for p_m and E_m of electron in terms of its linear momentum and kinetic energy respectively, the expression shall be as: p_m = $(m_e)_{eff}$ v and E_m = $(m_e)_{eff}$ $v^2/2$ respectively. The momentum $(m_e)_{eff}$ v and energy $(m_e)_{eff}$ $v^2/2$ shall produce the same effects as the momentum p_m and energy E_m respectively shall produce. The term $(m_e)_{eff}$ is the effective mass. The spin motion of electron cannot increase its mass. It increases the effect of its mass m_e to $(m_e)_{eff} = m_{mov}$. [For more detail and how the expressions for relativistic energy $E_k = [m_e c^2 / \sqrt{(1 - v^2/c^2)}] - m_e c^2$ and relativistic momentum $p_{lin} = m_e v / \sqrt{(1 - v^2/c^2)}$ for electrons are obtained as the consequence of superposition of the effects of E_s and p_s of electrons on their E_k, and p_{lin} respectively, see starting from the last but one paragraph (column-1, page-69) to second paragraph (column-2, page-70, i.e., the end of Sec. IV C) of Sec. IV C, Ref. 4.]

4.2 Importance of the accounts of both, the generated two properties and the generated force

The account of the generated two properties in electrons together with the account of the generated force between electrons enable to explain all the phenomena, properties and effects etc. related with electromagnetism (see Sec. 4.2.1) and superconductivity (see Sec. 4.2.2). And The account of the generated two properties in nucleons together with the account of the generated force between nucleons enable to explain all the nuclear phenomena, properties and nuclear structure etc. (see Sec. 4.2.3).

4.2.1 Explanation of the phenomenon of electromagnetism and of the related properties

4.2.1 (a) Present explanation (i.e. taking accounts of the generated two properties in electrons and the generated force between electrons**)**

The accounts of the generated two properties in electrons and the generated force between electrons enable to give almost a complete understanding of:

1. How electromagnetism is generated in a current carrying rod and how magnetic field is generated around that (current carrying) rod (see Sec. 4.1, Ref. 5).

2. Why and how the magnetic field generated around the current carrying rod occurs in a plane perpendicular to the direction of flow of current through the rod and how it (magnetic field) possesses direction (see Sec. 4.1, Ref. 5).

3. Which type of magnetism (electromagnetism) is generated in the rod (see Sec. 4.2, Ref. 5).

4. How magnetic north and south poles are created in electron orbits and they (orbits) behave like magnetic dipoles (see Sec. 5.1, Ref. 5).

5. How magnetic north and south poles are created in current carrying closed loops and they (loops) behave like magnetic dipoles (see Sec. 5.2, Ref. 5).

4.2.1 (b). Current explanation, and faults in it

In the current explanation of electromagnetism and electromagnetic phenomena/properties etc.:

1. The basic belief/assumption that the electron possesses spin magnetic moment (μ_s) and magnetic field due to spin motion of its charge is not true, see Sec. 1, Ref. 5.

2. The basic belief/assumption that due to orbital motion of charge of electron, a magnetic field occurs around the orbital path of electron and it possesses orbital magnetic moment (μ_l) is not true, see Sec. 1, Ref. 5.

3. Regarding how electromagnetism is generated in a current carrying rod, how magnetic field is generated around it in a plane perpendicular to the direction of flow of current through the rod etc., no explanation is found. It is merely being assumed that due to flow of charge of electron through the rod, all these are generated.

4.2.2 Explanation of the phenomenon of superconductivity, related properties and effects

4.2.2 (a) Present explanation (i.e. taking accounts of the generated two properties in electrons and the generated force between electrons**)**

The accounts of the generated two properties in electrons and the generated force between electrons enable to give almost a complete understanding of why and how superconductivity is generated (see Sec. 4, Ref. 3), and how its related phenomena/properties/effects take place (see Sec. 5, Ref. 3). For example:

1. Why and how the entropy at superconducting state of the substance decreases (see Sec. 5.1, Ref. 3).

2. Variation of T_c (transition temperature, i.e., temperature at which the substance transits from its normal state to its superconducting state) from substance to substance (see Sec. 5.2, Ref. 3).

3. Why and how the substances like Cu and Au etc. do not superconduct even down to very low temperatures (see Sec. 5.3, Ref. 3).

4. How Meissner effect takes place and how a magnet is levitated above a superconductor (see Sec. 5.4, Ref. 3).

5. Why and how diamagnetism generated in substances at their superconducting state persists, while generated at normal state does not persist (see Sec. 5.5, Ref. 3).

6. No occurrence of superconducting state in ferromagnetic substances (see Sec. 5.6, Ref. 3).

7. i. How normal state of specimen is restored applying an external magnetic field H_c across it at its superconducting state (see Sec. 5.7.1, Ref. 3). ii. Why H_c increases as temperature of specimen decreases beyond its T_c (see Sec. 5.7.2, Ref. 3). Iii. Why H_c varies from substance to substance (see Sec. 5.7.3, Ref. 3).

8. i. Why and how thermal conductivity of the specimen is discontinuously increased when superconducting state of the specimen is destroyed by the application of an external magnetic field H_c (see Sec. 5.8.1, Ref. 3). ii. Why and how thermal conductivity of specimen changes continuously between its two phases, and how at superconducting phase, it is found to be lower (see Sec. 5.8.2, Ref. 3).

9. i. Energy gap between electrons at normal state and electrons at superconducting state of the specimen (see Sec. 5.9.1, Ref. 3). ii. Why energy of electrons goes on decreasing as temperature of the specimen decreases below T_c (see Sec. 5.9.2, Ref. 3).

10. Josephson's Tunneling (see Sec. 5.10, Ref. 3).

11. Latent heat of transition (see Sec. 4.11, Ref. 3).

12. Why and how the specific heat of specimen is discontinuously increased when the temperature of the specimen is brought down to its T_c (see Sec. 4.12, Ref. 3).

4.2.2 (b) Current explanation (i.e. assuming wave nature of electrons**), and faults in it**

To explain as to how superconductivity and properties effects etc. exhibited by superconductors are generated, several theories have so far been proposed. For BCS (Bardeen–Cooper–Schrieffer) theory[2] it is claimed that it provides better quantum explanation of superconductivity and accounts very well for all the properties exhibited by the superconductors. But none of these theories has been developed taking account of the factors pointed out above.

The BCS theory no doubt provides better quantum explanation of superconductivity and accounts very well for all the properties exhibited by the superconductors. But if we examine the BCS theory and its rigorous mathematical proofs closely and intently, we find that it is based on such concepts which are practically not possible and contradict two well-observed facts too (for detail, see bullet 2 of Sec. 1).

Secondly, the BCS theory does not explain all the properties exhibited by the superconductors. It fails to explain several very important properties.

4.2.3 Explanation of nuclear phenomena, structures and properties of deuterons, alpha particles nuclei

4.2.3 (a) Present explanation (i.e. taking accounts of the generated two properties in nucleons and the generated force between nucleons**)**

The accounts of the generated two properties in nucleons and the generated force between nucleons enable to give almost a complete understanding of neutron structure (see Sec. 2, Ref. 9) and its properties, e.g.:

1. Mean life time (t) of neutron (see Sec. 3.1, Ref. 9).

2. Why and how time t happens to be = 885.7 $\pm$ 0.8 seconds (see Sec. 3.2, Ref. 9).

3. Why and how neutron has both stable and unstable states (see Sec. 3.3, Ref. 9).

4. Magnetic moment of neutron (see Sec. 3.4, Ref. 9).

5. Electric dipole moment of neutron (see Sec. 3.5, Ref. 9).

6. While it is believed that the electrons do not reside inside the nuclei then why and how the electrons are emitted from the nuclei during β decay (see Sec. 3.6, Ref. 9);

7. Why and how beta particles emitted from radioactive sources have continuous energy spectrum (see Sec. 3.7, Ref. 9).

8. Why and how the neutron has high penetrating power (see Sec. 3.8, Ref. 9).

9. Why and how the neutron has distinguishable low and high energy ranges (see Sec. 3.9, Ref. 9).

The accounts of the generated two properties in nucleons and the generated force between nucleons enable to give almost a complete understanding of structure and properties of deuterons, alpha particles and nuclei. For example:

1. How neutron becomes stable in system, deuteron (see Sec. 4.1, Ref. 7).

2. Why and how system deuteron (*NP*) exists in nature while the system di-proton (*PP*) does not exist in nature (see Sec. 4.2, Ref. 7).

3. Why and how system di-neutron (*NN*) too does not exist in nature (see Sec. 4.3, Ref. 7).

4. Why and how due to the addition of one *P* in system *NN*, the resultant system, i.e. the nucleus of H^3 becomes stable, while the system *NN* is not stable (see Sec. 5.1, Ref. 7).

5. Why and how E_b of the resultant system (nucleus of H^3) becomes $> 2\times(E_b)_D$ (see Sec. 5.2, Ref. 7).

6. Why and how due to the addition of one *N* in system *PP*, the resultant system, i.e. the nucleus of He^3 becomes stable, while the system *PP* is not stable (see Sec. 5.3, Ref. 7).

7. Why and how E_b of the resultant system (nucleus of He^3) becomes $> 2\times(E_b)_D$ (see Sec. 5.4, Ref. 7).

8. Why and how $(E_b)_{H^3} > (E_b)_{He^3}$ (see Sec. 5.5, Ref. 7).

9. Despite $(E_b)_{H^3} > (E_b)_{He^3}$, why and how H^3 is radioactive and decays into He^3 through β decay (see Sec. 5.6, Ref. 7).

10. How two-neutrons and two-protons are arranged in an alpha particle such that it persists and behaves like a particle, and how beams of alpha particles are obtained despite having repulsive Coulomb force between these (see Sec. 6.1, Ref. 7).

11. Why and how E_b of α particle is increased to $> 6\times(E_b)_D$ instead of increasing to $2\times(E_b)_D$ (see Sec. 6.2, Ref. 7).

12. How nucleons are arranged in nuclei having mass number A = integer multiple of 4 (e.g. nuclei of He^4, Be^8, C^{12}, O^{16}, Ne^{20}, Mg^{24} etc.) such that they (nuclei) are most strongly stable and how their E_b increases as their A increases in multiple of 4 (see from Sec. 7.1 to Sec. 7.9, Ref. 7).

13. How E_b of Be^8 is reduced to < E_b of He^4 while A of Be^8 = 2×A of He^4 (see. Sec. 7.2.1, Ref. 7).

14. How nucleons are arranged in nuclei having A ≠ integer multiple of 4 (e.g. Li^6, Li^7, B^{11} and N^{14}) such that these are not strongly stable, and how E_b of Li^6 and Li^7 increase as their A increases but are reduced to < E_b of He^4, though A of Li^6 and Li^7 > A of He^4 (see Sec. 8.1, Ref. 7), how E_b of B^{11} is reduced to < E_b of Be^8 though A of B^{11} > A of Be^8 (see Sec. 8.2, Ref. 7), how E_b of N^{14} is reduced to < E_b of C^{12} though A of N^{14} > A of C^{12} (see Sec. 8.3, Ref. 7).

15. Why and how E_b of nuclei, after becoming maximum near A = 62, gradually starts decreasing as A increases (see Sec. 9.1, Ref. 7).

16. Why and how nuclei become radioactive when A > 200 and α and β particles start emitting from them (see Sec. 9.2.1, Ref. 7).

17. How γ (gamma) and ν (neutrino) are emitted from nuclei and how γ and ν obtain particle like physical existence as photons possess (see Sec. 9.2.2, Ref. 7).

18. Why and how γ and ν obtain so high energy and momentum (see Sec. 9.2.3, Ref. 7).

4.2.3 (b) Current explanation, and faults in it

Regarding neutron structure and its properties, there are several models to explain. But they all are unable to give clear and complete understanding of neutron structure and about its properties. The quark model though succeeds to give understanding of neutron structure but gives rise to numerous very fundamental questions over the concepts taken in this model (see Sec. 3.10, Ref. 9). Regarding structure and properties of deuterons, alpha particles and nuclei, very little is known.

ACKNOWLEDGEMENT

The author is grateful to his respected and loving teacher, Prof. Ashok Kumar Gupta, Professor of Physics (Retd.), Allahabad University, Allahabad (U.P.), INDIA, for his valuable continuous moral support, encouragement, time to time discussion, sincere advice and help.

REFERENCES

1. Kunwar Jagdish Narain, A new quantum theory, vixra: 1512. (Quantum Physics), http://vixra.org.

2. J. Bardeen, L.N. Cooper, J.R. Schriefer, Theory of superconductivity, Phys. Rev. 108 (5) (1957) p. 1175.

3. Kunwar Jagdish Narain, Understanding superconductivity: A new approach, vixra: 1111.0097 (Condensed Matter), http://vixra.org

4. Kunwar Jagdish Narain, A new interpretation to quantum theory, Phys. Essays **22** (2009) p. 47. Also available at http://physicsessays.aip.org.

5. Kunwar Jagdish Narain, Understanding electromagnetism: A new approach, vixra: 1111.0072 (Condensed Matter), http://vixra.org.

6. Kunwar Jagdish Narain, Determination of a new force with characteristics of nuclear force and both attractive and repulsive components, vixra: 1207.0109 (Nuclear and Atomic Physics), http://vixra.org.

7. Kunwar Jagdish Narain, Understanding deuterons, alpha particles and nuclei: A new approach, vixra: 1203.0105 (Nuclear and Atomic Physics), http://vixra.org.

8. H. Yukawa, Proc. Phys.-Math. Soc. Japan **17** (1935) p. 48.

9. Kunwar Jagdish Narain, A new neutron model, vixra: 1512. (Nuclear and Atomic Physics), http://vixra.org.

10. W. Bertozzi, Am. J. Phys. **32**, 551 (1964).

11. Geoff Brumfiel (July 7, 2010). "The proton shrinks in a size." Nature. Doi:10.1038/news. 2010.337.