

The Subtle and Elementary Physical Structures in Jainism Perspective

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Abstract

Properties of matter, *pudgala*, particularly at subtle¹ level, are described in detail in Jainism. The smallest constituent of matter is *paramanu* and its aggregation forms bigger structures of *skandhas* and *varganas*. In this article I study the properties of *paramanu* in modern context and investigate the properties of groups of *paramanus* and *varganas* in the scientific perspective. I present logical arguments on the basis of information available in Jaina texts to describe the characteristics of groups of *paramanus* and then go on to study the four touch and eight touch *varganas*. Photon, in modern science, can be assumed to be an eight touch *vargana* composed of infinite *paramanus* according to Jainism and it has that many *quanta* of energy. All the gross matter in the universe is composed of the biggest eight touch *vargana* called *Mahaskandha Vargana*. How this *vargana* forms particles like quarks is not mentioned in Jainism. But this can be understood with the help of clairvoyant observations of atoms of hydrogen and other chemical elements made by Annie Besant and Leadbeater. Scientific knowledge of matter is not sufficient to understand the processes taking place in the bodies of organisms. Jainism provides conceptual knowledge about subtle structures used in the body of organisms as well as other physical structures that has the potential of giving new direction to scientific study.

Keywords: *Paramanu*, *vargana*, photon, quark.

Introduction

¹ Subtle matter is sense imperceptible.

Jainism describes the characteristics of *jiva* and *ajiva* substances in detail. The properties of matter, which is the subject of scientific study today, also finds important place in Agamas. The smallest constituent of matter is *paramanu* and the bigger structures are formed by its combinations known as *skandhas*. Jainism describes the properties of *paramanu* and rules for formation of *skandhas*. All this knowledge is obtained by *direct* cognition by consciousness, without the aid of sensory organs or mind. Science regards such information as subjective and speculative. Scientific findings are based on experimental observations, and theoretical and statistical analysis. This kind of study is called objective, which is repeatable in space and time. However all scientific knowledge needs subjective observer who uses media of rather imperfect senses and mind. Why then the knowledge obtained by *direct* cognition without the use of imperfect media is regarded as speculation and unreliable is a question. Annie Besant observed the inner structures of chemical elements clairvoyantly, which were later found agreeing with the scientific findings. This lends support to the belief that the knowledge obtained by *direct* cognition is reliable and true.

In modern particle physics ordinary matter is composed of elementary particles such as quarks and leptons (e.g. electrons) and force carriers, like photons. According to Jainism these structures are of gross type having eight touch properties. Jainism states that there are still smaller structures having four touch properties which in turn are made up of *paramanus* having only two touch properties. Science has not yet discovered these structures. It has of course discovered great many details of eight touch gross structures that are not available in Jainism. Thus Jainism and science are complementary and together provide us a complete spectrum of information about the physical universe.

Paramanu

A *paramanu* is the ultimate, indivisible constituent of the physical universe. It is eternal and cannot be split or destroyed by any means whatsoever [1]. *Paramanu* is not sense perceptible but its large aggregates are perceptible. The properties of gross forms of aggregates are described in terms of sense perceptible qualities, a method that was followed in ancient times. The sense perceptible qualities are colour, smell, taste and touch. Jain philosophy believes that a substance has the same properties in all its forms i.e. properties do not change with form. So

paramanu also has the same properties as the gross form of matter. Every *paramanu* has one of the five primary colours-black, blue, red, yellow and white, one of the two smells-good and bad, one of the five tastes- sweet, bitter, pungent, sour and astringent, and two of the four primary touches i.e. either hot (*usna*) or cold (*shit*) , and either smooth (*snigdha*, positive charge) or rough (*ruksha*, negative charge)² [2]. It has many kinds of motions like spin, vibration, linear, rotational, oscillation, etc. [3]. The velocity of motion in any mode is uncertain and it changes with time [4]. *Paramanus* differ in respect of colour, smell, taste and touch properties. *Paramanus* have innate affinity of uniting with other *paramanus* to form composite structures. Such structures are liable to disintegrate setting the *paramanus* free. The process of association and dissociation of *paramanus* is a regular phenomenon. *Paramanu* never loses its identity even when it is part of a composite. Any number, up to infinite, of *paramanus* can occupy a single space point [5]. A *paramanu* is capable of being dynamically active. The activity of a *paramanu* is not continuous but is rather intermittent. *Paramanu* can be cognized by effect of collective action of a group of them or by direct experience of transcendental knowledge (of a perfect soul).

Cold, hot, smooth and rough are primary touch qualities of *pudgala*. The other four touch qualities viz. light (*halka*), heavy (*bhari*), soft (*mridu*) and hard (*karkash*) are secondary touch qualities. These touch qualities are supposed to develop when bonding between infinite *paramanus* produces a gross aggregate. If number of negative *paramanus* is more in the bonding process, the aggregate contains light touch quality and if positive *paramanus* are more, than heavy touch is produced in the aggregate. When positive *paramanus* are in majority and they bond in cold condition, soft touch is produced and when a majority of negative *paramanus* bond in hot condition, hard touch is produced in the aggregate [6]. The mass of the aggregate is said to relate to the light and heavy touch qualities. The four touch aggregates and *paramanus* are mass less. The mass is a property of gross aggregates having eight- touch [7].

² The smooth touch is regarded as positive charge and the rough touch is regarded as negative charge. This is based on the commentary Sarvartha-Siddhi on sutra 5/24 of Tattvartha Sutra which says "*Snigdha-ruksatva-guna-nimitto udyot*", which means that lightening in clouds is produced by the qualities of *snigdha* and *ruksha*. According to modern science lightening is produced due to positive and negative charges in the clouds. So *snigdha* is taken as positive charge and *ruksha* is taken as negative charge.

What is *paramanu* in terms of modern science? All known elementary particles fall in two groups: fermions and bosons. Fermions do not share the same space the way bosons share. So a *paramanu* is not a fermion. Bosons are force carriers and are regarded as virtual particles because these are not detected by particle detector, the way the 'real' particles are detected, but they exist. The electromagnetic attraction between protons and electrons in the orbit is pictured as being caused by exchange of large number of photons. Photons have no charge and therefore do not compare with *paramanus* which have charge. It is shown below that photon in fact is composed of infinite number of *paramanus*. A *paramanu* has kinetic energy of motion and potential energy of charge and therefore can be regarded as an energy particle having charge. Charge is an essential property of *paramanu*. And since the *paramanu* is indivisible its energy is the quantum of energy.

***Paramanu* Groups and Aggregates**

There are billions or trillions of *paramanus* in a small space and they are all moving in criss-cross way. The *paramanus* have no preferred type of motion and may move randomly in different directions with any combination of motions. But it can be expected that in any particular direction there would be thousands or millions of *paramanus* moving with different speeds. The *paramanus* moving with similar speeds fall in groups. The *paramanus* in a particular group have **affinity** to unite because of their charges. So the group behaves as a unit and the *paramanus* close up together. The group now has a denser structure.

Every group contains *paramanus* with positive and negative charge. As *paramanus* draw closer, aggregation of *paramanus* takes place i.e. the *paramanus* are packed in the *pradesa* space and the density of charge in *pradesa*³ increases. This also reduces the space occupied by the group. So, aggregation results in high energy density and a denser structure. The net charge of the aggregate, or group, shall be decided by the total number of positive and negative *paramanus* in the aggregate, or group, and the charge of individual *paramanus*. But the total energy of the aggregate, or group, shall be the sum of energy of all *paramanus*, positive and negative, in that aggregate, or group. The group so formed has four touch properties: positive, negative, hot and cold and is said to be massless in Jaina terms.

³ *Pradesa* is (point) space occupied by a *paramanu*.

Vargana

Vargana is a group of *paramanus* acting as a unit. Although *vargana* is physical entity it is described in Jaina texts from the point of view of its use to *jiva*. When studying the physical structures we must understand the *varganas* in that form. An attempt has been made by the author to understand *varganas* in physical context [8] and interpret their meaning in scientific perspective. We shall follow that approach here. Eight kinds of *varganas* are described in Bhagwati Sutra [9] and 23 kinds in Gommattsara Jivakanda [10]. In the latter system the *varganas* are classified on the basis of number of *paramanus* in the group. The lowest order *vargana* has just one *paramanu*. The next higher order *vargana* has countable *paramanus*. The next higher *vargana* has innumerable *paramanus* and the next higher order has infinite *paramanus*. Up to this stage the *varganas* are just collection of *paramanus*. It has been mentioned that a *vargana* having less than infinite number of *paramanus* has no useful application because its energy is too small to be practically useful.

Following Gommattsara system the following four touch *varganas* are useful to *jiva*.

1. *Ahara vargana*. This type of *vargana* is useful in making the gross, protean and migratory bodies of organisms.
2. *Taijas* (bio energy) *vargana*. This type constitutes the *Taijas* or energy bodies of organisms.
3. *Bhasha* (Sound) *vargana*. This type is used in producing all kinds of sounds.
4. *Mano* (Mind) *vargana*. This type is used in forming the physical mind of organisms.
5. *Karman vargana*. This type constitutes the karma body of organisms.

Besides these five types, there are other four touch *varganas* but these do not associate with *jiva*. Many types of infinities are defined in Jainism [11] and all the above five types of *varganas*, and also other higher *varganas* to be described later, contain *paramanus* in numbers more than the lowest type of infinity. The energy and charge density of *karman vargana* is highest among the above five types of *varganas*. Also this *vargana* is smaller in size than the other four types due to process of aggregation

On further increase in charge density another kind of phenomenon known as bonding is supposed to take place. It is described in Jaina texts that bonding takes place between

positive and negative *paramanus*, positive and positive *paramanus*, and between negative and negative *paramanus* [12]. Jainism describes the rules for bonding. Bonding between two *paramanus* does not take place if their charges are at minimum level⁴. Bonding between positive and negative *paramanus* takes place when their charges exceed the minimum level irrespective of the difference in the charge of the two *paramanus*. But bonding between two similarly charged *paramanus* takes place only when the difference between charges of the two *paramanus* exceeds by two or more units.

The *paramanus* in an aggregate may have positive or negative charge. Bonding between these *paramanus* shall take place according to above rules. A bonded aggregate shall be called here as b-aggregate. A *vargana* has large number of b-aggregates each having different net charge. Bonding between these b-aggregates shall also take place according to same rules.

Bonding of *paramanus* in *vargana* has great significance in determining the characteristics of the physical structures. It is said that higher *varganas* are eight touch type i.e. in addition to the four touch possessed by lower order *varganas* these *varganas* also have other four touch properties called soft and hard, and light and heavy. The aggregates in the group vary in respect of charge and thermal property. There are aggregates which are positive and hot, positive and cold, negative and hot and negative and cold. The term hot may refer to excited state and cold may refer to un-excited state of *paramanus* here. Bonding of *paramanus* in positive aggregates would develop heavy touch and bonding of *paramanus* in negative aggregates would develop light touch. If bonding in positive aggregate is taking place in cold condition soft touch would be produced and if bonding in negative aggregate is taking place in hot condition hard touch would be produced. The heavy and light touches generate inertia in the system and introduce a new property called mass in the *vargana*. The four touch *varganas* are massless. In modern science mass is acquired by particles due to interaction with Higgs field.

The property of eight touch in *vargana* becomes stable only when there are enough b-aggregates in it . This happens in *varganas* higher than *karman vargana*. In the *Santer-*

⁴ The charge of *paramanu* spontaneously varies from a minimum level to some maximum level by a process known as '*sadguna hani vridhi*'.

Niranter vargana, next higher than *karman vargana*, such conditions prevail intermittently i.e. sometime the *vargana* exists in eight touch form and sometime in four touch form. The conditions of bonding stabilize in the next higher *vargana* called *Pratyeka Sarira Vargana* (PSV, Individual Body *Vargana*). This *vargana* is 17th in order in the Gommattsara system. This *vargana* is supposed to help produce food in autotrophic plants. According to modern biology plants make their food with the help of sunlight. So we infer that sunlight consists of *Pratyeka Sarira Vargana* i.e. each photon of sunlight is PSV. According to modern science the photon has zero rest mass, has energy equal to the product of frequency of radiation and Plank's constant, and is regarded as quantum of energy. According to Jain view, photon consists of infinite number of *paramanus* and large number of b-aggregates as shown in figure 1. The energy of a *paramanu* is the minimum energy in nature and is the real quantum of energy, whereas modern science assumes energy of photon as energy quantum. This impels us to appreciate how Jainism describes nature at infinitely smaller scale than that measured by modern particle physics. As the photon has neutral charge, the charges of positive and negative *paramanus* would be equal.

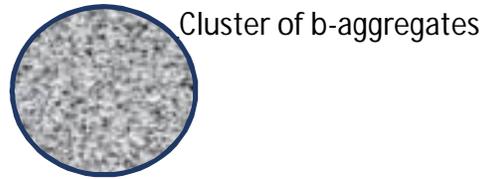


Figure 1. Photon

Gross (Ordinary) Matter

The last, i.e. 23rd *vargana* in the Gommattsara system is *Mahaskandha Vargana* (MV). This *vargana* is supposed to be the source of all gross matter in the universe. How *Mahaskandha Vargana* forms the gross matter is not mentioned in Jaina texts. But this can be understood with the help of information obtained by clairvoyant observations of atomic structure by Annie Besant. Clairvoyance is one of the *direct* cognition methods and Jainism gives great importance to knowledge obtained by *direct* cognition.

Annie Besant and C.W. Leadbeater clairvoyantly examined the chemical elements Hydrogen, Oxygen, Nitrogen, etc. [13]. The drawings of the structure of elements were made by two artists on the basis of observations made by them. The observers said that the elements could

be raised to etheric⁵ conditions by will power. They found that the gaseous state is succeeded by the etheric state, just as the solid is succeeded by the liquid. The etheric state is found to cover four sub states distinct from each other. Thus the matter in the physical world has seven sub states, including the three of solid, liquid and gaseous.

They first examined the chemical element of hydrogen which appeared to have six bodies contained in an egg-like form as shown in figure 2. It rotated with great speed on its own, vibrating at the same time, the internal bodies performing similar gyrations. The whole atom spins and quivers and has to be steadied before exact observation is possible. The six little bodies are arranged in two sets of three forming two triangles that are not interchangeable. The six bodies are not all alike; they each contain three smaller bodies which were called as Anu or Ultimate Physical Atom (UPA). In two of them the three Anu-s are arranged in a line, while in the remaining four they are arranged in triangles. It is, of course, impossible to convey in words the clear conceptions that are gained by direct vision of the objects of study.

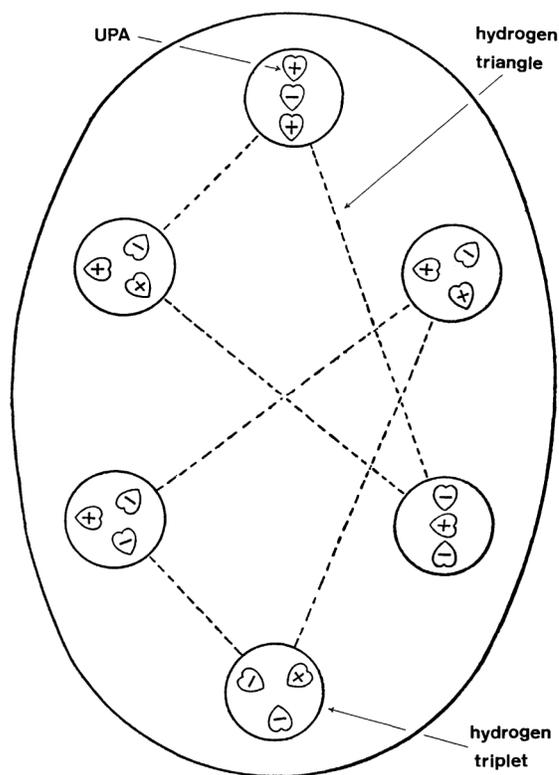


Figure 2. The hydrogen (Reproduced from Occult Chemistry)

⁵ Etheric condition is subtle state of the element created by will power such that its size can be enlarged, to suit its study.

Two types of Anu-s were observed by them as shown in figure 3. In one case force pours in from the “outside” and passing through the Anu pours out back into the physical world. In the second case, it pours in from the physical world and out through the Anu into the “outside” again i.e. vanishes from the physical world. The former is like a source and the second is like a sink. They called source Anu positive or male and the sink Anu negative or female. Note that the terms positive and negative do not refer to charge here. All Anu-s observed by them were one or the other of these two forms.

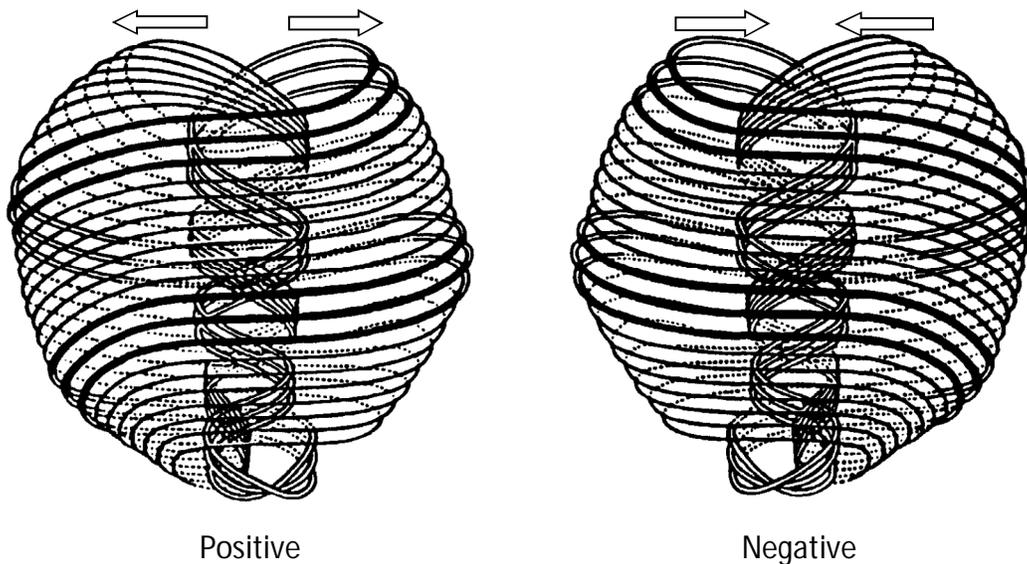


Figure 3. The Anu (Reproduced from Occult Chemistry). Arrows marked on top are by the author. It was seen that the Anu is a sphere slightly flattened having a depression at the point where the force flows in, and there is a little apex at the diametrical opposite location. According to Besant and Leadbeater, the Anu can scarcely be said to be a “thing”, though it is the material out of which all things physical are composed of. It is formed by the flow of ‘life force’ and vanishes in its absence. If the flow were checked for an instant, the whole physical world would vanish as a cloud melts away in empyrean. It is only the persistence of that flow which maintains the physical basis of the universe.

Describing the construction of the Anu the authors said that the surrounding force flows in, and three whorls appear with their triple spiral of two and half coils, and returning to their origin by a spiral within the Anu, (see fig3); these are at once followed by seven finer whorls, which, following the spiral of the first three on the outer surface, and returning to their origin by a

spiral within that, flowing in the opposite direction forms a caduceus with the first three. Each of the finer whorls is formed of seven yet finer ones, set successfully at right angles to each other, each finer than its predecessor, called spirillae. In the three whorls flow currents of different electricity; the seven whorls vibrate in response to etheric waves of all kinds- the sound, light, heat, etc.; they show the seven colours of the spectrum; give out the seven sounds of the natural scale; respond in a variety of ways to physical vibrations- flashing, singing, pulsing bodies, they move incessantly, inconceivably beautiful and brilliant.

'Force' pours into the heart shaped depression at the top of the Anu, and issues from the point, and is changed in character by its passage. The force rushes through every spiral and every spirilla, and the changing shades of colour that flash out from the rapidly revolving and vibrating Anu depend on the several activities of the spirals, and with the change of activity from one spiral to another, the colour changes.

The Anu has three proper motions independent of any imposed upon it from outside. It turns incessantly upon its own axis spinning like a top; it describes a small circle with its axis, as though the axis of the spinning top moved in a small circle; it has a regular pulsation, a contraction and expansion, like the pulsation of the heart. When a force is brought to bear upon it, it dances up and down, flings itself wildly from side to side, performs the most astonishing and rapid gyrations, but the three fundamental motions incessantly persist.

Two Anu, one positive and the other negative, brought near to each other, attract each other, and then commence to revolve around each other, forming a relatively stable duality; such a molecule is neutral.

Besant and Leadbeater observed atoms of many chemical elements of the Periodic Table and studied their structures. These structures fell into seven natural classes with a few exceptions. The reader may refer to the book Occult Chemistry for details.

Scientific Perspectives of Clairvoyant Observations

Stephen Philips studied the work of Besant and Leadbeater in scientific perspective [14]. In the paper published in 1995 he reports how facts of nuclear and particle physics are consistent with the purported psychic descriptions of subatomic particles by Besant and Leadbeater, made nearly 100 years ago. He says that most of their descriptions of atoms were published several

years before physicists even suspected that atoms had nuclei and therefore their observations must not be rejected as fraudulent.

He interpreted the observations in the context of current scientific knowledge of the atom. In the Standard Model of particle physics, the subatomic particles are composed of fundamental spin -1/2 particles called "quarks". This model requires six varieties of quarks to exist; the up (u), down (d), charm- (c), strange (s), top (t), and bottom (b) quarks. The up quark with its partner the down quark makes up the protons and neutrons inside atomic nuclei. A proton consists of two positively charged up quarks and a negatively charged down quark and a neutron consists of one up quark and two down quarks. Philips and some other physicists have proposed that quarks are not fundamental but are composed of still smaller, indivisible particles which may be called subquarks. If quark consists of three subquarks, protons and neutrons would each consist of nine subquarks bound together as three groups of three subquarks. This view compares with the observations made by Besant and Leadbeater as shown in fig. 2 in which each triangular array has three bodies each enclosing a group of three Anu. Then each body compares to a quark, the Anu to a subquark and the upper triangle structure compares with a proton or neutron. The two triangular forms observed by Besant and Leadbeater could be deuteron or arrangement of two similar nuclei of hydrogen according to Philips.

On detailed study, Philips reached the conclusion that Besant and Leadbeater accurately describe by ESP quasi-nuclear, bound systems of subatomic particles created from pairs of atomic nuclei of the element under observation.

One of the questions in science is to answer how the quarks are bound together in proton and neutron. The currently accepted theory assumes a strong force between quarks. Each quark exists in three quantum states called "colour"; red, blue and green. Each colour state is characterized by its "colour charge", which is the source of the strong force binding quarks together. This "colour force" is transmitted by eight spin-1 particles called gluons. In the Besant model, Anu is supposed to have magnetic charge, albeit of a kind similar to that known to be associated with the colour force rather than with ordinary magnetism. Indeed, the positive and negative types of Anu have opposite magnetic polarity. According to Besant and Leadbeater,

the positive Anu, acts as a source and “force comes out” whereas the negative Anu acts as a sink and “forces disappear”.

It may be mentioned that despite his attempts, Leadbeater did not succeed in examining an electron with his micro-psi powers.

Reliability of Annie Besant data has also been examined by Neppe and Close [15]. They proposed a Theory of Everything known as TDVP (Triadic Dimensional-Distinction Vortical Paradigm) model as a comprehensive attempt to develop a unified model to reconcile physics, biology, psychology, parapsychology, philosophy, consciousness researches and mathematics [15]. A concept of vortices has been introduced in this model. Such vortical motions are assumed to exist at all levels starting from the subatomic and up to larger ones like movement of large masses. Authors argue that the mathematics currently being used in mainstream physics is inadequate, and sometimes inappropriate for application to quantum phenomena. The authors devised new calculus called the Calculus of Dimensional Distinction (CoDD) in which the mass/energy content and space-time volume of elementary particles are multiples of the unitary quantum equivalence units of the smallest finite distinctions possible in quantized reality. This new calculus allows a clearer understanding of electrons and quarks and subatomic, atomic and molecular structures of reality.

The authors also proposed (and proved) the hypothesis that mass is nothing more and nothing less than the combined resistance to acceleration due to the angular momentum related moments of inertia of the rapidly spinning elementary particles that, in combination, make up an object. They proposed that quarks are rapidly spinning energy vortices and protons are spinning vortex created by the combination of three elementary vortices of quarks. To do such calculations the authors used the mathematics of integrals, the Diophantine equations to the integral powers of 3. In this process they found that additional quantum equivalence units were necessary to form a stable proton. So the quarks were provided with additional units to produce an axially rotating symmetric vortex and therefore stable proton. These additional units, they called gimmel, occupy space-time but do not register as mass or energy. Proceeding on these lines they accurately predicted the mass of proton. So the hypothesis that quantum particles like quarks and their combinations may be treated as energy vortices was validated.

The authors also correctly predicted the mass of neutron. All these calculations were carried out taking electron mass as a quantum unit.

Recently Neppe, Pokharna and Close [16] made a comparative study of 92 elements of the Periodic Table observed clairvoyantly by Besant et al. and TDVP and Triadic Rotational Units of Equivalence (TRUE) quantum unit scores for nucleons. When they examined the data relative to the (3S-1t) usual physical state, the variation was found to be unidirectional with the spread of data close to -10.94% when including electrons, and 8.80% without electrons (which is more appropriate because Besant was not describing electrons but only nucleons—protons and neutrons). They then adjusted the data to a 9-dimensional perspective, and applied a trial-and-error correction and it turned out to be exactly 9.0% added to the original Besant's Anu scores. After adding the 9% correction to the anu-s, the resulting average difference on 91 elements was 0.0080 and the standard deviation 0.016374, analysed as a population score difference, and therefore handled as a single unit of correlation. The Pearson-r correlation coefficient is 0.9996. (Elemental 1, Hydrogen, does not have a neutron and so is excluded). Nevertheless, 6 of the 91 individual elements varied, though only slightly, in their results from the 85 other elements. These variations are small — between 2.5% and 5.2%— and the differences hypothetically could be explained by stable long life common isotopes that might have appeared during several 'clairvoyant' readings of the same element.

The data of Besant et al is not only profoundly statistically significant, it is truly unmeasurable and with correlation coefficients approaching one. The results also appear to be fraud-proof given that the Besant data has been available in published form for a century.

Interpretation of Clairvoyant Observations in Jain Perspective

According to Jainism, clairvoyance is attained in a wide range of levels, from low to high. In the highest case the *param avadhijnani* is able to see objects as minute as a *paramanu*. The smallest part both Besant and Leadbeater could see was the Anu, much bigger than the electron. This indicates that their clairvoyance level was not of very high kind. The observations of such clairvoyant persons may not be hundred percent correct and may require examination before its validity is accepted.

The Anu was seen to be a kind of spiral or vortical structure in spherical form in which a 'force' pours in from cosmos, moves in a web of spiral path and goes out at the opposite location on the sphere. What is this 'force' in Jain view? The *Mahaskandha Varganas* (MV) are supposed to be the source of all gross matter; this can happen only when these *varganas* form clusters. This prompts us to believe that the 'force' entering the Anu is a stream of MV. The MVs form clusters in the spherical space. Billions of MV are packed inside the spherical space in a spiral arrangement and a continuous flow of MV is maintained in the spirals. The flow takes place in thousands of spirals before finally exiting the spherical space. This Anu is not a "thing" as rightly said by the authors but it is composed of billions of MVs which themselves are aggregation of infinite number of *paramanus*. It is the electrical force between the MVs that keep them bound in a spherical space. If this flow were checked the Anu would not form a stable structure of quark as explained below.

The flow of charged MV in a spiral path produces a magnetic field. The MV has positive and negative charge. As the Anu consists of thousands of spirals, the magnetic field produced exerts a magnetic force on another Anu in close vicinity. This magnetic force binds together the three Anu-s to form the quark. If the MVs were not flowing the quark structure would not exist.

Similar magnetic force exists between the quarks in a proton.

Besant and Leadbeater observed three types of motions in Anu spin, rotation and pulsation. We know that spin and rotation are natural motions of *paramanu*. Pulsation requires further explanation. The MVs in cosmos are supposed to exist with differing charges and so the flow of MV entering the Anu does not have same charge. The variation in charge of MV would change the size of the sphere which appears as pulsation motion of Anu.

Besant and Leadbeater identified two types of Anu-s, positive and negative, the former having source like flow and the latter having sink like flow in the spherical unit. We know that direction of electric flow in the spiral decides the direction of magnetic field produced.

Therefore the source and sink types of flow would produce Anu with magnetic forces of opposing nature that would keep the Anu bound together in a quark. The Anus is also seen to arrange itself in triangular and linear fashion. In the former case the Anu forces are at 120 degree to each other and in the latter case the forces align on the same axis. Both of these

arrangements would produce magnetically stable structures. Conversely, we can say that the Anu-s arrange themselves in a way so as to produce a stable structure.

Annie Besant's clairvoyant observations have helped us to explain formation of quark, proton and neutron from Jain point of view. We have no such help to explain formation of the smaller particle the electron. But it can be visualized that the electron is also formed by clustering of MVs.

Conclusions

According to Jainism the fundamental constituent of physical reality is *paramanu* which is an energy particle having charge. The *paramanus* form groups and produce bigger structures. The *paramanus* in the group aggregate so that a large number of *paramanus*, up to infinity, share the same space increasing the charge and energy density. The premise that the fundamental unit of matter is an energy particle having charge is entirely a new concept and may change the way matter is dealt with in physics.

Lower order *varganas* have four touch properties and higher order *varganas* have eight touch properties. The *Pratyeka Sarira Vargana* in the higher order category compares with photon. The real quantum of energy is *paramanu* which is far smaller than the energy of a photon. All gross matter in the universe is composed of the biggest *Mahaskandha Vargana*. How particles like quarks and protons are formed from *Mahaskandha Vargana* has been explained with the help of structure of hydrogen observed clairvoyantly by Annie Besant and Leadbeater. The subquarks and quarks are bound together by magnetic force produced by electric charge of *vargana*. It is also argued that subquarks and quarks could not exist without *Mahaskandha Vargana*.

The Jaina theory provides knowledge of formation of subtle matter in the form of *vargana* and elementary particles like subquarks and quarks. Modern science has carried out detailed study on formation of gross matter starting from electrons and quarks. Thus Jainism and modern science are complementary and together present a complete picture of the structure of the physical universe.

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