The philosophy of *Paramāṇu* in Jainism: the invisible yet physical God Particle

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Abstract

Science and philosophy go hand in hand; just as every scientist is a philosopher, every philosopher is a scientist, too, as both science and philosophy are concerned with finding the reality and nature of things. Where science focuses on discovering through experimentation of the physical, philosophy aims to peel off the layers of a specific through valid reasoning. Both deal with the restlessness of mankind and motivate the same to find the secrets of the universe. Finding the smallest indivisible particle of Matter is one such quest of science which is inevitably philosophical.

Neutrinos and Leptons are a few of the elementary particles discovered by physicists that lay the foundation of the physical world. We notice that ancient Indian philosophers called the most fundamental particle *paramāṇu,* which translates into English as **the absolute atom**, and gave a detailed description of the same. *Paramāṇu* is the smallest indivisible part of Matter, known as *pudgala* in Jain philosophy. According to the scholars of this Indian philosophy, a *paramāṇu* cannot be grasped through any instrument, irrespective of how advanced the machinery gets. It can only become worthy of sensory perception when in a *skandha* (group of countless *paramāṇu*). Hence, just like the realization of the soul, understanding the *paramāṇu* is also a matter of actuality. This paper sheds light on the same as in other Indian philosophies and present-day physics and deals in detail with the description of *paramāṇu* provided by the Jain philosophers of India.

Introduction

When we look back at the history of science or philosophy, we find that our ancestors have already done a lot of work for us. Especially ancient Indian scientists were the ones who researched immensely not only to know Matter and the soul but also their relationship and differentiation with each other. The purpose of science and philosophy is the same: to find out how nature works. Why do the occurrences happen in a specific pattern? What lies underneath everything, and so on. Being the most developed species on the planet, humans lead this quest as it is their innate nature to seek the truth. In this context, we see two main leads in this field to enquire about. One is the conscious entity whose restlessness motivates it to know whatever there is, and the other is the non-living component to decode which the prior expresses interest. Just like every younger generation in a family takes pride in being the most rational in its quest to deal with life, every generation of thinkers and scientists think in the same way towards decoding the truth. This doesn't mean that our ancestors were not wise enough because over time, just like the younger conclude, after having their own life experiences, the elders were right in many matters. Even philosophers take refuge in the findings of their forefathers. In the search for 'the god particle,' the present generation can peep into the philosophical texts of this Indian philosophy, where the same particle is termed *paramāṇu,* which translates into English as 'the absolute atom', which is the smallest indivisible unit of Matter known as *pudgala* in Jain philosophy.

Pudgala (Matter) in Jain philosophy

O humans to know the truth, thy have to differentiate between thyself and the Matter. For thy share the closest bond with the same, and in the art of differentiating lies liberation.
We notice the physicality of Matter at all times around us, in each of our chores, as 'material substance constitutes the observable universe and, together with energy, forms the basis of all objective phenomena'[1]. However, philosophers aim to break down an object to find its building blocks to know how things work. In this context, Jaina philosophers named Matter as *pudgala* and have defined the same as 'that which has the innate nature of association and dissociation, such corporeal inert substance is *pudgala*'[2]. Most of us wake up with an alarm every morning, freshen up, have tea/coffee and prepare ourselves for the day. During each of the doing, be it as an individual or at a collective level; we use objects which join and get separated all along. For example – in the action of brushing our teeth, the association of toothpaste, brush and water happen with our teeth, and after completing that task, they part. Similar happenings of alliance and separation keep happening throughout one's personal life and with everyone around one.

These acts of union and dissolution are possible because, at a subtler level, the tiniest part of Matter has this innate ability; this is the materiality of Matter. In the philosophical text Tattvārtha Sūtra, ācārya Umāsvāti describes the nature of *pudgala*[3] further, 'the clusters of matter and single atoms have material qualities'[4]. To understand the same better, we can say that the material nature of (absolute) atom reflects in the bunches of Matter. For example – a single grain of an uncooked lentil cannot be located if fallen on the ground, whereas it becomes easier to find the same if it is many. However, we observe that a single grain has the same taste and qualities as the group of grains (of the same lentil), due to which the specific flavour of that lentil is possible. Hence, one can grasp it either way from many numbers of grains to a single grain or from a single grain to many grains. Though in philosophy, we take the single grain, or the absolute atom, to understand the nature of things. Hence we see that 'the existence of *paramāṇu* can be inferred on observation of their collective effect'[5].
In the context of *pudgala* (Matter), when we try to find out the number of units in an object, the great Indian philosopher Umāsvāti explains[6], 'the number of units in clusters of matter may be enumerable, innumerable or infinite'[7]. In the above example of a lentil, once it is cooked, it becomes hard to know how many grains it contains. This uncertainty increases with the quantity of the cooked lentil; for example – when the same lentil gets cooked in a household, the units of the lentil can be counted, or the number can be guessed. But when the same gets cooked at a charity kitchen where thousands of people are eating, and the lentil is in the process of getting cooked continuously, it becomes tougher to count the exact number of units. (P.S. – this is a simple daily life example just to have an idea of the philosophical nature of Matter, in an absolute sense, it doesn't apply on the same)

Types of *Pudgala*

Maman, why cannot one rejoin the broken branch with its tree?
On the contrary, why does milk re-unites with its contemporaries?
Why cannot one capture one's own shadow?

Do words have a physical existence
Or are they merely philosophical?
Why is one born to one's parents only?
Is there a science behind everything
Or everything exists casually?

Now come the queries that any curious mind can and must have. Let us look around and observe some daily life situations, for example – a singer's songs, an actor's acting skills in a movie, a leader's motivational speech, and an author's wisdom in the form of a book. All of these stay available on different platforms, in other formats, even after the demise of that specific person. Have we ever noticed how it can be possible? Most of us ponder that our utter words are conscious; however, they do not seem to be. Dealing with the subject of Matter (*pudgala*), Kundakunda ācārya describes elaboratively in his text *Paṁcāstikāya*, written around the 2nd Century C.E. about how wood, water, words, light and darkness and all subjects that belong to the senses along with those which are even beyond sensory perception like karma etc., fall into the category of *pudgala*. Honorary ācārya has divided the types of *pudgala* into six categories, from gross to subtle.

1. Very gross (*bādara-bādara*) – Those objects that do not recombine themselves once separated, for example – wood and stone.
2. Gross (*bādara*) – Those objects that recombine themselves again even after getting separated, such as milk, water, oil and purified butter (*ghee*).
3. Gross-subtle (*bādara-sūkṣma*) – Those material substances that appear gross but cannot be separated or held by hands. Such as – sunlight, shadow and moonlight.
4. Subtle-gross (*sūkṣma-bādara*) – Those substances which are subtle but appear to be gross, like touch, taste, smell, and word.
5. Subtle (*sūkṣma*) – Those substances which are minute and cannot be grasped through the senses, like karma.
6. Subtle-subtle (*sūkṣma-sūkṣma*) – Substances that are even subtler than the karma, such as a highly minute aggregate of atoms (*dvayaṇuskandha*).

Seeing the above-detailed description of the gross as well as the minute matter, we notice that even the understanding of Matter is more philosophical and less about trying to prove the same on a logical ground. One may ponder the material nature of light, darkness, words etc. When we dive deeper into the metaphysics of life, we notice that consciousness is inevitably bound to express itself through Matter. As even 'life is a manifestation of matter'[8]. As in Indian philosophy, the body of a being is considered Matter that takes shape according to the karma of a specific being.

Skandha **(group of infinite absolute atoms) and molecule**

O, the building blocks of materiality have been found
However, being the groups of immeasurable tiny-minies
As the absolute fragment, can they be crowned?

Attributes of *Pudgala* have been further described as 'due to its mutual bonding only; different, ordinary and peculiar, objects get produced in the world, which is termed as *skandha.* Touch, taste, smell and colour are the prominent attributes of *pudgala*'[9]. *Skandha* can be compared

with a molecule, which is a group of two or more atoms that form the smallest identifiable unit into which a pure substance can be divided and still retain the composition and chemical properties of the substance'[10]. For example – a water molecule starts to own the attributes of water when it becomes touch, taste, smell and colour worthy by the union of two Hydrogen atoms and one Oxygen atom. When we try to probe even further, we realize that even an atom, of be it Hydrogen or Oxygen, is made up of electron, proton and neutron, which in turn are made up of quarks as 'each proton and each neutron contains three quarks'[11].

Indian philosopher and saint ācārya Kundakunda mentions in the philosophical treaties about Matter written in 1st century B.C., *Paṁcāstikāya*[12], that '*skandha* is made up of infinite *paramāṇus*'[13]. Physicists today can peel off the material substance's layers in a beautiful way. However, we notice that there still lies a gateway of possibilities of infinite absolute atoms inside even the tiniest particle. Probing further into decoding the nature of non-living Matter, ancient Indian philosophers indicated that even words result from bilateral abrasion of many such *skandha,* which means the basic building blocks are the same for words. Because sound, no matter if it gets shaped through speech or writing, is also *pudgala*. Acārya mentions[14] that a word gets produced due to the mutual friction (contact) of many *skandha*. Hence, a word is definitively a product[15]. This way, we analyse that everything that has physicality in the universe has identical foundational god particles, which can only be grasped when they are in *skandha* (groups).

Paramāṇu **(the absolute atom) in Jain philosophy**

Look, the main lead is found
The building block of all physicality
The hidden treasure
That seems the farthest
But is the closest
On this realization
The seeker is astounded

In his search for truth, after peeling off the countless layers of relativity, man eventually reaches a state of the end, the ultimate, where nothing is left afterwards. This is the state of realization when the absolute atom becomes understandable. In Jaina metaphysics, the *pudgala* is a tangible reality, and its first form is *paramāṇu* (the absolute atom)[16]. In the philosophical text *Paṁcāstikāya* which is about the five fundamental substances of the universe, with an *asti* (*astitva* or beingness) and extension, the philosopher ācārya Kundakunda describes *paramāṇu* as[17] 'the last outline, the last iota, the ultimate halt of all the *skandha* is *paramāṇu*. The *paramāṇu* is eternal, which means indestructible in the past, present and future, without sound, occupies only one space-point and is monolithic'[18]. Being the most fundamental building block of the material world, the *paramāṇu* is perpetual, which indicates it never loses its essence, no matter how much effort is made to destroy it. Acārya also clarifies[19], 'the *paramāṇu* is devoid of sound itself; however, it is the cause of the word'[20]. To elaborate, we can say the absolute atom does not possess sound. Yet, it is the cause of the same but only when in groups (of many similar counterparts) as it has the ability to generate friction. This situation of the absolute atom is identical to the idiom 'it takes two to make a quarrel'.

Strengthening the imperishability of the absolute atom again, Acārya writes[21], 'the *paramāṇu* is eternal, which means it is forever indestructible'[22]. No matter how much chaos is caused, the *paramāṇu* will not lose its existence. As it only sieges one space point of the entire universe, 'it is capable, as well as incapable of providing space to others'[23]. Describing further how the absolute atom sustains its eternal properties, ācārya conveys that 'due to occupying only one space point, it keeps its formlessness and similar attributes intact'[24]. Now the query arises where does the absolute atom start occupying space, and where does it stop? The teacher clarifies, 'because of occupying one space point only its beginning, middle and end are all the same. It is indivisible and monolithic. That is why it does not have any scope for anything else[25]. Another Indian scholar from sometime between the 2nd and 5th century CE, Acārya Umāsvāti, also confirms the essence of the absolute atom[26] by mentioning in his philosophical treatise, 'there are no additional units in an atom'[27]. It is individual and self-sufficient in itself. In the absolute sense, the *paramāṇu* seems to be an illusion, but it is not. The beauty of this ancient Indian philosophy is that it explains the unexplainable.

The uniqueness of *paramāṇu* doesn't stop here as 'due to the attribute of occupying one space point, it has the strength to penetrate the *skandha* (molecules) into many pieces'[28]. This attribute of *paramāṇu* is similar to the quality of the neutrino. As 'neutrinos are nearly massless particles that can move as easily through lead as we move through the air and are notoriously difficult to pin down'[29]. Scientist Michio Kaku also writes, 'neutrinos leave no traces of their presence; they can easily penetrate through the earth'[30].

Dealing with the next query that arises in the readers' minds: if the *paramāṇu* can penetrate the *skandha*, how can it make one? Acārya leaves no stone unturned as he clarifies further that 'it is also the doer of the *skandha*, and due to its potency of union, it produces the molecules'[31]. Indeed the *paramāṇu* is the ultimate particle as it is the one that creates the visible objects in the entire cosmos, and it is the one that destroys them.

Just like words (be they spoken or written) are the products of *pudgala* (non-living Matter), we need the help of *pudgala* only to understand the abstract nature of time. For practical purposes, we are supposed to give forms, symbols and units to the concept of time, which is made of non-living matter. Moving ahead, ācārya Kundakunda throws light upon the involvement of the absolute atom in the same. The teacher mentions,[32] 'the *paramāṇu* is the one that divides the time and measures and calculates the numbers'[33]. For it is the building block for everything that is not abstract, and we notice that as soon as mathematics enters into the numeric dimension, it becomes material. We see that 'Jaina metaphysics maintains that *paramāṇu* is both cause (*kāraṇa*) and effect (*kārya*) of the material world'[34].

Matter and atom in different philosophies

O child, strive to know the Matter in totality to know thy immortality.

Ancient Indian scientists, scholars and philosophers were all naturalists as they used to aim to find the secrets of nature. Interestingly they used to follow a strict regimen in their style of living as well, which used to be in synchronization with the laws of the cosmos. Hence, in India, they were known as saints, *ṛṣi*, *muni* and *ācārya*. *Kaṇāda ṛṣi*, the founder of the *Vaiśeṣika* school of Indian philosophy, was one such natural scientist and philosopher who formulated

the theory of atoms 2500 years before John Dalton's discovery[35]. He considered the atom indivisible, a point source and without magnitude[36].

The change first has to occur at a substantial level to be able to observe the visible difference. However, at the most minute level where the absolute atoms exist, there is an unchangeable essence, which does not change at all. The view of *Nyāya Vaiśeṣika* is that 'the atom, as the basis of changes in all material substance, exists as absolutely permanent without any kind of change'[37].

Kapila Muni founded the *Sāṁkhya* school of thought in the 1st millennium BCE[38]. *Prakṛti* of the *Sāṁkhya* school represents Matrix or Primordial Matter as non-living, eternal, infinite, all-pervading, undecaying and indestructible in nature.[39] In contrast, *puruṣa* is the principle of being the indifferent spectator of the changes that take place in *prakṛti*[40]. This way, *Sāṁkhya* philosophy depicts *prakṛti* as the non-living matter and *puruṣa* as the living substance of the universe.

Interestingly, all Indian schools of philosophy convey more or less the same truth. In the context of matter and atom, some schools tally on some points while disagreeing on some. For example – the Buddhist tradition advocates atomism like the *Nyāya Vaiśeṣika* and the Jaina system of thoughts[41]. From the 4th to 5th Century C.E.[42], Buddhist scholar Vasubandhu explained that the nature of the Atom (*Paramāṇu*) is to exist as combined[43]. Hence, one atom cannot be grasped, whereas a group of innumerable atoms can be seen, touched, smelled, tasted or heard. A group of atoms makes it the object of knowledge that can be accessed through the five senses.

Three Indian schools of thought, namely, *Sāṁkhya*, *Nyāya Vaiśeṣika*, and Jaina, agree on one point that self-identity of the fundamental substance as substratum is to remain non-divisible[44]. At the elementary level, we notice that an object has an unchangeable, indestructible and indivisible essence. This makes the smallest unit of matter the subject matter of realization that transcends physicality.

Matter (by far) in Modern Physics

Philosophy is science's elder brother. The prior discover the laws of nature through rational theory, and the latter achieves the same through logical experiments.

In the early days, philosophers used to ponder nature and its laws. They kept discovering, sometimes using logic and mathematics also. Science began to evolve as a separate discipline as experimentation took ground, and observations from the experiments started to impact rational thinking to build a consistent picture of the world, which heavily relied on mathematics. Now, philosophy and science may be considered two complementary subjects. However, as both deal with the search for the laws of nature, they often meet together and enrich each other. To conciliate between science and philosophy, we can say that philosophy is more about the intuitive powers of an individual philosopher. In contrast, science is more of a collective effort to discover the laws of nature through experimentation.

The modern scientific view of elementary particles, which are fundamental building blocks of matter, is summarized in what is known as the Standard Model. There were atoms and molecules in the beginning, and the old philosophical views probably referred to these atoms. An atom could combine with other atoms to make molecules, and an aggregate of these atoms

and molecules can make the bulk Matter, something that becomes the subject Matter to be grasped through the senses.

However, scientists discovered that an atom consists of electrons and a tiny central nucleus. This tiny nucleus was found to carry most of the atoms' mass and consist of protons and neutrons. However, studies on nuclei, protons, and neutrons led to the strong suspicion that these protons/neutrons consist of more fundamental particles. Through experiments and theory, it was found that neutrons/protons consist of what we now call quarks. In the standard model, there are six types of quarks now. An interaction between quarks by the force carriers, which are bosons in nature, can give rise to many more particles. In fact, hundreds of such particles have now been found. But six quarks represent the fundamental elementary particles. Besides the six quarks, there are three light particles known as leptons. These are electron, muon and tau particles, which are also fundamental and have no structure. Each lepton has a companion neutrino specific to the three particles. Thus, there are three types of neutrinos.

The force carrier of quarks are the gluons, and the leptons are the photons (light particles). Every particle gains mass when it interacts with the Higgs field. A quantum of the Higgs field is the Higgs boson, which many call the God particle (a very misleading term). All these particles are governed by the laws of quantum field theory, a very complex but reasonably rigorous theory. This theory also demands that every particle also has an anti-particle, which has been verified in experiments. Sometimes, a particle can be its own antiparticle. The modern view still continues to evolve as new experiments are done and further observations are made. For example, the necessity to postulate dark matter and dark energy have raised the big question - what is it that dark matter and dark energy consists of? There is no answer so far.

Conclusion

O absolute particle, accept my reverence. But I wonder how you would do that, as despite being the subject matter of knowledge, you are devoid of consciousness. So, should I bow my head in front of not you but the absolute soul? That knows you in your totality and, in the process, travels the journey towards its own reality.

Ancient Indian philosophers were soul scientists who provided ground for deeper contemplation where there was no segregation regarding the basic building blocks of the universe; hence, the Indian scholars termed it as ‘the absolute atom’. This way, not many elementary particles constitute the physical universe but only one type of atom, even at the base of those elementary particles. And that absolute atom has the right to be known as the god particle in the real sense as there is nothing beyond it. Now we may ask ourselves why we should enquire about the absolute atom; instead of being conscious, we must focus on knowing our natural essence. Our ancestors left no stone unturned as they researched the intimate relationship between consciousness and matter. The reason is simple when we realize the opposite nature of matter and the soul and that what we consider ourselves is not us but matter, we transform and embark on our spiritual journey.

Eventually, be it science, philosophy or religion; each subject aims to find the secrets of the universe. Keeping this in mind, all can go hand in hand to travel towards the ultimate destination to achieve absolute knowledge. In the context of the absolute atom, we can say, ‘the soul travels to become the *paramātmā* in the journey to know the *paramāṇu*’.

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More information about him at https://channeli.in//media/faculty_biodata/resume/2c2b3c4e-7a5b-409a-8a68-6941d722c2e5.pdf

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