THE THEORY OF MATERIAL/ATOMIC CLUSTERS (RUPA-KALAPA)

Y. KARUNADASA

1. The Theravada theory of material/atomic clusters has seemingly no antecedent history in the treatises of the Canonical Abhidhamma. It is first alluded to in the Visuddhimagga. In its fully developed form, it is found in the Buddhist sub-commentaries and in the Abhidhamma compendiums.

2. In the Visuddhimagga the term used to mean the smallest unit of matter is “atom”(paramanu). In the Buddhist sub-commentaries and Abhidhamma compendiums the term often used is “cluster” (kalapa). “Atom” means that it is the smallest unit of matter. “Cluster” means that although it is the smallest, yet in the final analysis, it is a cluster of material elements.

3. The fundamental principle underlying this theory can be traced to the Abhidhamma teaching on Conditional Relations. According to this teaching, nothing can activate as a single cause, nor can anything arise as a single effect. It is always the case that a plurality of conditions gives rise to a plurality of effects. This is true of both mind and matter.

4. The four Great Material Elements, and four of the Dependent Elements, viz. colour, smell, taste, and nutritive essence, are necessarily co-existent and position-wise inseparable. The secondary material elements are always dependent on the great material elements, as they cannot arise independently of the latter. No can a single great material element arise independently of the other three. There is no material element, whether primary or secondary, that can have an independent existence: Material elements always arise as clusters or groups. Consequently when a given instance of matter is reduced to smaller parts, whatever the number of parts or whatever be the size of each part, the fact remains that each of them is a cluster or group of material elements. The smallest unit of matter, whether we call it “atom” (paramanu), or “cluster” (kalapa), or “group of material elements” (rupsamudaya), is no exception to this universally applicable law.

5. The Sarvastivada theory of atoms takes a different form. As Venerable Professor K. L. Dhammajoti, says:

“An atom (paramanu) is the smallest rupa. It cannot be cut, broken, penetrated; it cannot be taken up, abandoned, ridden on, stepped on, struck or dragged. It is neither long nor short, square nor round, regular nor irregular, convex nor conclave. It has no smaller parts; it cannot be decomposed, cannot be seen, heard, smelled, touched. It is thus that the paramanu is said to be the finest (sarva-suksma) of all rupas… Seven of these paramanu-s constitute an anu … Seven anu-s constitute a tamra-rajas …Seven tamra-rajas constitute an ap-rajas … Seven up-raja-s constitute a sasa-rajas … Seven sasa-rajas-s constitute an edaka-rajas … Seven edaka-rajas-s constitute a go-rajas … Seven go-rajas-s constitute a vatayana-rajas … (In this way, the whole physical universe is composed.)” (Venerable Professor K. L. Dhammajoti, Sarvastivada Abhidharma, p. 260.)

6. According to Sarvastivada, there are two kinds of atom, the unitary atom (dravya-paramanu) and the aggregate atom (samghata-paramanu). The former is the smallest unit of matter: It is the most subtle (sarva-suksma); it has no parts (niravayavat), and therefore no spatial dimensions can be predicated of it. It is just like the moment, the smallest unit of time. The unitary always arises and exists in combination with other unitary atoms. A collection of them, forming a unity and having a simultaneous origination and a simultaneous cessation, is called “aggregate atom” or “molecule” (samghata-paramanu). Smallest aggregate atom is an octad, consisting of the four great material elements and four of the secondary elements, namely, colour (rupa), smell (gandha), taste (rasa), and the secondary variety of touch (bhautika-sprastavya). That the four Great Elements always arise simultaneously and that the Secondary Elements cannot arise independently of the Great Elements are the two basic principles involved in the conception of the “aggregate atom”.

7. The nearest Theravada term to the “unitary atom” (dravya-paramanu) of the Sarvastivada is “the limb of the group” (kalapanga), that is, a constituent of a “cluster” (kalapa). The term “limb” (anga) suggests that it has no independent existence and implies a whole. However, it is the “cluster” (kalapa), not the “limb of the cluster” (kalapanga) that is recognized as the smallest (sabba-pariyantima) unit of matter.

8. For the Sarvastivada the atom is the smallest unit of a single material element (dharma), so small that it has no spatial dimensions. For the Theravada, the atom is an aggregate of a number of unitary material elements (dhammas). This is why it is described as “cluster of material elements” (kalapa). It corresponds to what the Sarvastivada calls “octuple aggregate”.

9. Since the Sarvastivada defined the atom as devoid of parts (niravayavat) and exempt from resistance/impenetrability (pratighata), this definition came in to be criticized by the Sautrantikas. They point out that if the atom is of this nature, it escapes the definition of matter. The Sarvastivadins’ response is: Certainly the atom is exempt from resistance/impenetrability, but matter in the form of an atom never exists in a state of isolation. When it is in a state of agglomeration, it is susceptible to disintegration and resistance. Another Sautrantika observation is that if the atom is devoid of parts and exempt from resistance, then the aggregate too will be devoid of parts and exempt from resistance, because the aggregate is ultimately constituted of the atoms. What is lacking in the latter cannot be predicated of the former. The Sarvastivadins’ response is that matter in the form of an atom never exists in a state of isolation, but in a state of agglomeration, and in this situation it is susceptible to resistance.

10. A somewhat similar criticism was voiced by the Idealist School of Buddhism as well. It points out that the aggregates are ultimately constituted of, and therefore cannot be different from the atoms, the difference between one atom and an aggregate being only one of magnitude. If this oneness is overlooked, it can lead to many mutually incompatible conclusions and will fail to give a rational explanation to many a phenomenon of day-to-day experience. It is a matter of common experience, for instance, that when the sun rises a given aggregate is found illuminated at its eastern direction and dark at its western direction, or when one sees or touches, say, a wall, one does not see or touch its opposite side – two situations that unmistakably point to the conclusion that the aggregates have spatial dimensions. This characteristic cannot be predicated of them, if the atoms that constitute them do not severally possess it.

11. If the atom has spatial dimensions, this is to admit its divisibility, a situation that goes against its definition as the most subtle (sarva-suksma). On the other, to deny its spatial dimensions is to deny the spatial dimensions of the aggregates, a situation contradicted by common experience. If anything, the atom should have spatial dimensions. But what is spatially extended is by its very nature divisible and what is divisible cannot be a real entity. The main problem the Buddhist atomists had to face was the definition of the atom.

12. For the Theravadins, the atom is not the "the ultimately small" (sabba-pariyantima) of a unitary material element, but the "ultimately small" of a cluster of material elements. Why they recognize a cluster as the smallest unit of matter, their argument seems to be this: It is true that since the "material cluster" is an aggregate of material elements, each of the constituents that make up this aggregation is smaller (subtler) than the aggregate itself. But this is only logically so. In reality the constituent of a material cluster does not exist by itself, but in inseparable association with the other constituents. Colour, taste, etc. cannot be dissected and separated like particles of sand. The colour of the mango, for instance, cannot be separated from its hardness, or from its taste. This situation is equally true of the constituents of a "material cluster" as well. Therefore, there is no necessity, other than logical, to postulate the constituent (kalapanga) as "the smallest of all" (sabba-pariyantima).

13. The next question is whether the atom as defined by the Theravada, has spatial dimensions or not. We need to note here that the basic "material cluster" consists of the four Great Material Elements and four Secondary Elements. Among them, the earth element represents the principle of solidity and spatial extension. Since the earth element enters into the composition of the atom, or the basic "material cluster", it follows that every atom is characterized by solidity, whatever be its degree of intensity and, by extension, whatever be its extent. Thus according to the Theravada, the atom has spatial dimensions.

14. Another controversial issue among the Buddhist atomists is whether atoms can come into contact with one another. In this connection the Sarvastivada grants the possibility of two alternatives, both of which they contend are equally inadmissible. The first is to assume that the atoms touch in their totality. If this were so, then the atoms being exempt from resistance/impenetrability, they would coalesce into one single atom. The second alternative is to assume that the atoms touch partially. If this were so, it would mean that the part-less atoms have parts. On the strength of these arguments, the Sarvastivada concludes that the atoms do not come in contact with one another and that between atoms there is always an intervening space.

15. The Sautrantikas criticize the theory of atomic non-contact. They contend that if the atoms do not come in contact, we cannot explain empirically observable contact between aggregates, because the aggregates are ultimately constituted of the atoms.

16. For the Theravada, the unitary material elements that constitute a "material cluster" (rupa-kalapa) are necessarily co-nascent and position-wise inseparable. Therefore the possibility of their being separated by an interval does not arise. The question is whether atoms/material clusters come in contact or not. The answer is that there is an intervening space between them. Every "material cluster" is

separated from the other. The intervening space is almost infinitesimally small, the idea of delimitation is described as “as if delimiting”. The vacuity is a fact, although it is infinitesimally small.

17. For the Sarvastivada, the theory of atomic non-contact is mainly based on the denial of spatial dimensions of the atom. For the Theravadins the issue as to the possibility or otherwise of physical contact of the atoms is a question relating to the “material clusters”, the spatial dimensions of which are not denied. It is argued that if the “material clusters” are not physically separated by the delimiting space, then this will lead to one of two alternatives, both of which are equally incompatible with the principle of positional inseparability.

18. The first alternative is to assume that the constituents of a “material cluster” are separated by the delimiting space. In such a situation the separateness and independence of each material cluster would vanish, establishing the separateness and independence of each of the constituents of the “material cluster”. Then the ultimate unit of matter would be the constituent (kalapanga), not the aggregate (rupa-kalapa).

19. The second alternative is to assume that there is no space between “material clusters”. Then the characteristic of positional inseparability, which applies only to the constituents of a “material cluster”, has to be extended to the two “material clusters” as well. In that case the separateness of each “material cluster” would vanish and both would combine to form a bigger material cluster. If the principle could be extended to two “material clusters”, then it could also be extended to three or more and so the process could be indefinitely extended. If a given piece of stone, let us say hypothetically, is composed of one billion material clusters, then those billion material clusters would become one material cluster precisely as big as that piece of stone. If the piece of stone is one big material cluster, then according to the theory of positional inseparability no part of it can be separated. The moment we break the piece of stone into pieces, the theory in question, too, so to say, breaks into pieces. Moreover, if two or more “material clusters” could combine to form a bigger “material cluster”, then this principle could be extended to embrace the whole physical world, resulting in a situation where the whole physical world would become one mighty big “material cluster”.

20. It is worth recalling here that one of the Sarvastivada arguments to deny contact between atoms is that if two of them touch in their totality, the atom being non-resistant and devoid of parts, all the atoms would coalesce into one – the whole physical world would coalesce into one atom so small that no spatial dimensions could be predicated of it. The Theravada objection is that if “material clusters” could touch each other the whole physical world would become one enormous material cluster, precisely as big as the physical world. The Sarvastivada objection is that the world would be reduced to an atom, so small that it has no spatial dimensions. The Theravada objection is that the atom/material cluster would be inflated to the size of the world – two situations literally with a world of difference.