Chapter 4
Nature as Elemental: The Matter of Nature

Abstract The idea of nature as constituted by five elements, or *pañcamahabhūtas*, is very popular in many naturalistic philosophies. Such a universe consists of both living and non-living parts of the cosmos. These elements are imagined as intangible to begin with, and then, they are understood as combining to form the gross elements which make up the cosmos. Traditions such as Vaiśeṣika and Saṁkhya explain the nature of these five fundamental elements and the process of creation of manifold diversities within them. This chapter will describe the materialism within Indian traditions and also dwell on the Vaiśeṣika atomism and the evolutionary nature of Saṁkhya tradition.

Keywords Elements · *Paṅcamahabhūtas* · Matter · Creation · Earth · Water · Fire · Air · *Ākaśa* · Atoms · Transformation · Subtle elements · Gross elements

4.1 Pañcabhūtas

The word *bhūta* is used to denote "being" or "existence" and also refers to past tense in Sanskrit. The connotations of this root *bhū* imply creation, manifestation, and evolution. According to Filliozat (1996), there are multiple meanings of the word *bhūta*. He writes:

> In this rich semantic material four layers are prominent. The first centres around the idea of the past, the second around the idea of reality, the third around the idea of the living being, natural or supernatural and the last around the idea of inanimate thing and especially the element of matter (p. 53).

One can assume that since beings, like *bhūta*s (unlike the Supreme Being), are born, exist for a period of time, and will one day cease to be, they are "created existents". In Sanskrit, the word *bhūta* can also specifically refer to a class of spirit beings who are regarded as attendants of Lord Śiva.

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For Halbfass (1992, p. 50), the terms *bhūta/mahābhūta* are said to "have an evolutionary connotation insofar as it suggests something that 'has become'". The other important meaning of *bhūta* is "material element". There are five fundamental elements, each of which is qualified as a *bhūta*. These elements are the fundamental types of material that make up the universe and therefore find mention in most classical Indian philosophies. Earlier Vedas such as the *Ṛg* (henceforth, as *RV*) refer to these elements but do not call them specifically as *pañchabhūtas*—a set of five elements. Also, not all schools of philosophy accept all the five elements. There are those like the materialists traditions for instance who do not accept space as an element.[1]

Lalye (1995, p. 65) establishes that the collective word appears only in later texts such as some of the Upaniṣads. We do however find many references to individual elements in Upaniṣads. Many of these references to elements are found in the themes of cosmogony, particularly questions of the origins of the universe. In the Vedas and Upaniṣads, there does not seem to be any specific description of the sequence of the origin of the elements, nor is there any enumeration of them as three or five. Later Upaniṣads, as the *Sāṃkhya Āranyaka* are clearer in their description probably after the rise of classical traditions (Lalye 1995).

Vedic texts often speak of one primordial being who is the source of both the intelligent and material cause of the creation. As the explanation of creation is based on a presupposition that it evolves out of one unitary being or materiality, the origin hypothesis must attend to a description of the process where diversity or the many is created from one. Halbfass (1992, p. 50) states:

> The individual elements are, of course, not necessarily presented as successive stages. From an early time on, they may be coordinated "horizontally" ***within*** "vertical" schemes of evolution. This is an example of "horizontal evolution" or "ramification" at one level of cosmic development. The elements evolve out of activities of the unitary supreme-being referred to as *Prajāpati* or as *Hiraṇyagarbha*.

Also required for such a world view is an explanation of the evolution of the gross (tangible) universe from a subtler being. Embedded in these theories are also hypotheses that explain the division of the conscious and the unconscious matter and distinguish the sentient from the insentient.

There are references to the individual elements in many of the Vedic and Upaniṣadic verses. The Vedas refer to these five elements, but not as a group or as the set of five elements. The five elements in the Vedas are not similar in their conceptualisations. The fire and wind elements are two of the primary deities of the Vedic pantheon. The Earth as a goddess is also accorded a status of a singular deity. The abstract sky and the waters have divine controllers but are not themselves clearly deified.

[1]The Cārvākas for instance believe in only four elements. They do not admit inference as a valid proof or meaning of knowing. Since space is intangible and cannot be grasped by senses, they do not admit that space can be an element.

4.2 Agni and Vāyu

4.2.1 Agni

Fire as an element in the Vedas is a very popular god with many hymns praising him. He shares a common origin with Indra being born of the mouth of the cosmic person … (*RV* X.91.13, trans. Griffith 1973). The connection between fire and water is often alluded to in some hymns. Logically, this seems an impossibility, but Staal (1996, p. 208) suggests that this is causal link. Since fire arises from wood, fire resides in plants. And since plants have water as their essence, the Vedic composers have made a connection with water and fire too. The same is true in the case of clouds, lightening, and fire. The deity of lightning, Mātariṣvan, brings down the heavenly fire to the Earth. All these origins have an empirical component to them showing that there was an attempt to connect elements based on the locus of origin, and not merely on the idea of a manifested quality. This might have been a precursor to the *tanmātra* concept of the Sāṃkhya philosophy.

The form of the deity *Agni* is not as anthropomorphic as gods like Indra. He is often called headless and footless and is considered in the form of flames:

> He is called butter face, butter backed, butterhaired, flamehaired.… His food is ghee, but he also devours woods and eats thrice a day.… *Agni's* Brightness is mentioned; he is like the sun, dispels darkness … but when he drives through the forest … his path is black. His flames soar terribly; his life reaches the sky (Keith 1925, p. 154).

The fire is supposed to have either seven flames or three flames, and the fire element is present wherever there is any heat. There are three kinds of fire classified functionally—the sacrificial ritual fire, the household fire and the fire of the funeral pyre. There are also different forms of the fire in the heavenly worlds (*śuci*), in the earthly spheres (*pavamāna*) and in the underworlds (*pāvaka*). The fire god is important in the Vedic world view for all their rituals as he is the messenger between the earthly plane and the heavens, who carries or conveys the offerings to the gods in heaven.

4.2.2 Vāyu

The wind element is a divinity in the Vedas. According to Keith (1925), the air element is referred to as both *vāyu* and *vāta*. While *Vāyu* is the more anthropomorphised deity, *vāta* is more elementary or natural. *Vāyu* is referred to as a form of the supreme *Brahman* that is presentational. Keith (1925, p. 139) describes the form of the air as *vāta:* "*Vāta* is merely the wind in its power, sweeping along great clouds of dust, shattering and thundering, his form cannot be seen by the mortal eye, though his roaring is heard, nor is the place of birth known". The wind is also linked to the rain god *Parjaṇya.* This is a very natural connection as clouds are

carried along by the wind. The air in many Vedic hymns is also known as a messenger of gods and is invoked as medicinal healer:

Tvaṃ hi visvā bhesśajo devanaṃ tu dutāsi
Thou art the healer, the messenger of gods (*RV*, XI137.3, trans. Griffith 1973)

In Āyurveda, *vāta* becomes one of the three physiological fluctuations (*dośa*) responsible for many movements. Particularly, *vāta* is responsible for dividing the embryo into parts within the womb. An earlier hymn in the *Ṛg Veda* refers to this.

So stir thee baby unborn (RV V.78.7-8, trans. Griffith 1973)

4.2.3 Earth, Water, and Space

Gombrich (1996, p. 371) mentions that the Earth does not seem to have an anthropomorphic form in the Vedas. The *Śatapatabrāhmana* refers to the Earth as a *maṇdala* (circular). The early Vedic descriptions of the Earth are naturalistic and refer to it as carrying the hills and mountains. This is the idea of the Earth as supporting the land below our feet, as opposed to the sky above. We occupy the intermediate space. Earth, as *bhūmi*, in its forms includes rocks, stones dust, and the land (*Atharva Veda* XII.1.26). In the Yajurveda (*YV* XII.18), we find that there is a direct injunction not to hurt the Earth: "*Pṛtvīm mā hiṃsiḥī*" (do not do violence to the Earth). It is in the Purāṇas that we find reference to the Earth as goddess.[2]

The element water is often referred to in its plural feminine form as "waters". They are goddesses and flow into the sea. Waters are related to the ocean and other landforms as mothers or wives; it is very clear that the nourishing fertility of water makes it easy to imagine the waters thus. All waters are functionally meant to purify and cleanse. The use of water in rituals was prevalent, and even symbolic sanctification, consecrations and the everyday rituals were done by offering water. The waters not only cleanse the physical body but also purify the demerits, particularly if linked to a sacred source are sanctified by chants. The anthropomorphic forms of the waters are the *apsarā*s (Keith 1925, p. 141). According to Oldenberg (1998, p. 126), they are water nymphs that move along the waters. Later interpretations give the sources of the waters—particularly the rivers—personalities and unique names. The deity Varuna is considered to be the controller of the waters in the Vedas. In the Ch. Up, it is said that the subtlest part of the food is consumed by the mind, while the subtlest part of the water is consumed by the vital force (*Ch. Up.* VI.7.6, trans. Ghambirananda,1983 p. 452). The link between water and life is found even in descriptions where water is called the essence of the Earth that makes up the beings.

[2]See Baindur (2010) for a discussion of the idea of the Earth as a sacred. A brief summary of this paper is also given in Chap. 8.

Ākaśa is known by many terms in the Vedas. It is still not clear whether the various meanings of this element and other terms that represent it can be subsumed under a general category of the element space. This is because there are so many meanings and contexts to the terms referring to the idea of space. Charkarabarti (1996, p. 109) suggests that the words for space are used in three layers of meaning that cover a whole range of interpretations—primary, symbolic, and metaphorical.

The earliest references to space in the Vedas are closer to the meaning of "sky" rather than space. The possible earliest reference is to the divine pair *dyāvāpṛthivī*, the Sky–Earth parents of the world. The intermediate space in between them is the first conceptualisation of space. The word for space may have come from idea of a gap or a hole, given by the term *kha* which stands for apertures or the axle hole of the wheel. The term *antarikṣa* is used to denote space in the Vedas, and the term *ākaśa* occurs in later texts. From a passage on meditation about space, we find that space is conceptualised as something that allows for freedom of movement (*Ch. Up.* I.9.1, trans. Gambirananda). We find reference to the term *ākaśamatra* in the *Prasnopaniśad* text, which refers to the subtle form of space as element, in contrast to mere *ākaśa* which is the gross element.

4.3 The Relationship of Elements in the Upaniṣads

Many verses in the Upaniṣads try and make interconnections between the diverse elements of the universe. This is an early attempt to claim unitary origins of the creation and a kind of evolution. In some Upaniṣads, for instance, the elements are included in a series of different aspects of the universe each of which forms the basis of another or its essence, or as each constituting a part of the supreme:

> Of these objects the earth is the essence; of the earth, water is the essence; of water, herbs are the essence; of the herbs the human body is the essence… (*Chāndogya Upaṇṣad* I.1.2, henceforth, *Ch. Up* trans. Ghambirananda, p. 8).

In verse VI.2.3, The *Chāndogya Upaṇṣad* states that as sweat is produced from heat in the body, water is born of the fire:

> That (Existence) saw, 'I shall become many. I shall be born.' That created fire. That fire saw, 'I shall become many. I shall be born.' That created water … water comes from heat (*Ch. Up.* trans. Ghambirananda, p. 422).

In the same chapter, the idea that all of the elements have a unitary subtle composition of the elements is indicated using the example of the fire:

> The red colour that (gross) fire has, that is the colour of (subtle) fire. That which is the white colour (of the gross fire), that is of (subtle) water. That which is the black colour (of the gross fire), that is the colour of the (subtle) earth… (*Ch. Up.* VI.3.4, trans. Ghambirananda, p. 434).

In the *Taittarīya Upaṇṣad*, there are many meditations describing the "great combinations". Among these is a reference to the combination of elements. In each of these combinations, there is one prior form and then a later form that form a link or junction referred to as *saṇdhi*.

One of these verses reads:

> As regards the meditation on the worlds: the earth is the first letter. Heaven is the last letter. The sky is the meeting place. *Vāyu* is the link (*Ta.Up.* I.3.2-4, trans. Ghambirananda, p. 434).

It is important to understand why the *Upaniṣad* uses the term *saṇdhi*. *Saṇdhi* refers to the phonetic combination of precedent and antecedent letters in two sequential words in Sanskrit language. For instance, if the precedent word is *hima*, the antecedent is *ālaya*. Their *saṇdhi* product is the word *himālaya*, the point of contact being the long vowel "*ā*" sound. One could posit that the combination of the elements is analogous to the combination of the elements. The implication of this is that there has to be a series of elements with a prior and a later element and the product has the qualities of both with no suggested or emergent meaning (as it is in the case of compound words formations called *samāsa*, which are meaning-dependent). The combination product conjoins the properties of both the combinants, the changes occurring only at the point of contact, (called "link" in the translation of the verse above) the *saṇdhanaṃ*. In the above verse, the contact itself is referred to as Saṇdhi Contact and the point of contact is the *saṇdhanaṃ*. Another meaning of *saṇdhanaṃ* is "forge" or the locus of a joint. From this understanding, we have an interesting imagery of the elemental combinations. The prior is the Earth and the latter is the heaven. The contact is the space, and the locus of the joint or union is the wind. Similarly, in another verse, the combinants are the fire and sun, the combination is the water, and the locus of the joint is the lightning. In these descriptions of the elements and the other combinations, the *Upaniṣad* describes instances of other combinations including the elements, loosely classifying them as belonging to the different realms or spheres of experience such as the physical, the luminous, or the experience of learning or birth of a child. There seems to be an attempt to deconstruct the universe to fundamental units of creation that form a unitary whole.

What is interesting in this metaphorical image is that the process of deconstruction here is analogous to language or the human body both of which have joints, or *saṇdhi*. The *Upaniṣad* does not use the metaphor of a pot or any other mechanistic image to describe these combinations. The idea of the body image seems relevant here because there are already references to the creation as a cosmic person, sometimes referred to as *Virāt*, or *Hiraṇyagarbha*. The elements then become the various bones of the supreme, the joints being the *saṇdhi* and the exact location of this joint is the *saṇdhanaṃ*.

Other verses in many Upaniṣads describe the formation of the elements. These preliminary conclusions about the formation of a universe that is available to our senses influence later classical philosophies that develop these ideas more concretely. Particularly, the creation of the five elements mentioned in the *Aitareya Upaniṣad*, verse I.i.4, seems to be a precursor to the Sāṃkhya theory about the

creation of elements. This particular verse describes that the elements arise from the body of the Virāt of the human form, speech is born from the mouth and from that speech, the element fire is born. Similarly, the division of the nostrils creates the sense of smell and from the sense of smell, comes *vāyu*. Likewise, the partition of the ears produces sense of hearing that gives rise to *dik*, directional space. The passage goes on to describe the production of all the organs including the mind from the heart and finally procreative organ from which water emerges.

In the Upaniṣads, we find the individual references to each of the elements and there are many different narratives of their origin. Here, the elements are not referred to as deities but as natural elements. *Muṇḍaka Upaniṣad* has a verse that everything originates from the *Puruṣa*, the Supreme Being:

> From Him originates the vital force as well as the mind, all the senses, space, air, fire, water, and the earth that supports everything (*Mu. Up.* II.1.3, trans. Ghambhirananda 1957a, p. 112).

4.4 The Natural Elements in Sāṃkhya

One of the most sophisticated descriptions of the five elements and their evolution is found in Sāṃkhya-Yoga philosophy. The process of creation is very clearly explained in the Sāṃkhya texts which postulate these elements as *tanmātras*, or subtle elements, and five gross elements as evolving out of the primary cause *mahat*. *Mahat* itself is the evolute of *prakṛti*, the primordial nature.[3]

We have already seen how the idea of *prakṛti* in Sāṃkhya is described as made up of three co-constituting *guṇa*s and also how the entire created world evolves from the primordial reality called *Mūlaprakṛti*. In this section, we shall particularly see how Sāṃkhya philosophers describe the evolution of the five elements and the creation of the coarse/tangible universe from the primordial nature. In the *Yuktidīpikā* (henceforth, *YD*), one finds that there are particular beings whose bodies are directly created from the elements. Other beings arise out of the body of a mother and a father, but these beings are called *prabhūta*. These element-born beings are either seed-born or sweat-born.

Sāṃkhya particularly distinguishes between subtle and gross elements. While the tangible world is made of the coarse or gross elements, the subtle elements are causal in creating the gross elements. Aniruddha, the commentator, in his *Sāṃkhya Sūtravṛtti*, points out that the manifest world is made up of the gross elements (Larson and Bhattacharya 1987, p. 349). The creation of the gross elements from the subtle elements and their relationship to the senses is a recurring theme in many philosophies. The purpose of the created elements is to function for the sake of the consciousness, the *Puruṣa* (cited in Larson and Bhattacharya 1987, p. 346):

[3]This has been discussed as one of the main conceptualisations of nature in Chap. 3.

> The effects of creative materiality are inclusive of the intellect through the five gross elements…. All of these effects function for the sake of the consciousness, but only as mediated through the activity of materiality.

4.5 Creation of the Elements from Primordial Materiality

Sāṃkhya philosophy explains the many evolutes of *prakṛti* as a complex set of *tattvas*, or principle entities: "The origin of all *Tattvas* is *Prakṛti*, the primordial nature" (*Sāṃkhya Kārika* 3, henceforth referred to as *SK*, XXII p. 22).

Larson (1979, p. 178) suggests that the analysis of the world in Sāṃkhya is from the perspective of the *puruṣa* who is both individual and impersonal: "In other words, world is comprehended in terms of how the *puruṣa* witnesses it. This explains why the principles (*tattva*s) in the *kārikā* are expressed in terms of the psychological rather than cosmological".

This view according to him is not particularly an experimental or scientific research of the psyche, nor is it an explanation of what the *puruṣa* experiences (as *puruṣa* actually does not act, being the witness principle).

Mohanty (1999, p. 209) points out that the creation of elements starts with the constituents of *prakṛti*, the three *guṇas*:

> On the Indian theory, the root Nature, the unmanifested ***prakṛti***, does not consist of atoms, only not yet forming heterogeneous combinations. It rather consists of what are called *guṇas* (provisionally to be rendered qualities). These ***guṇas*** are said to be three: ***sattva***, ***rajas***, and ***tamas***. These constituents, we are told, are of the nature of pleasure, pain, and indifference respectively.

The manifest world arises from the unmanifest, and the first of these *tattva*s (translated as principle or entity) to arise from *prakṛti* in the presence of the *puruṣa* is the intellect principle (*buddhi*). This is not the thinking faculty of the mind, but the *buddhitattva* posited as the intelligence principle of creation itself, the guiding rationale that determines the ordered progress of creation. Larson (1979, p. 89) points out that like the *puruṣa*, "… the *buddhi* is individual yet impersonal". One must also note that the *buddhi* is *jada*, unconscious except in the presence of *puruṣa* that (is uninvolved in action, but) supports the evolution of *prakṛti*. This is also called *mahat*, or great. The *mahat* precedes the egoity or awareness of the self (*ahaṃkāra*) and so it overrides the idea that the world is a personal creation. The *mahat* can be conceptualised as a master plan in potential, ready for the egoity to manifest itself. Larson (1979, p. 180) suggests that this might be an idea that is derived from earlier cosmological accounts of a creative principle.

The process of creation is intelligent in the sense that it is full of resources (*aiśvarya*), knowledge (*jñana*), ascertainment (*adhyavasāya*), and order (*dharma*). This is the sattvic form of *buddhi*, the tamasic form being the opposite. It is not clear from texts whether these are constituents of *buddhi* or qualities. Given the Sāṃkhya understanding of *prakṛti*, it is likely that these are transformative and co-

constituted by the *guṇas*. Having these features does not imply will or any form of personal intelligent activity we associate with mind functions.

Another significant point to note is that Sāṃkhya philosophy does not have a divine god or overseer. In some sense a mechanistic intelligence that functions in the presence of a conscious witness entity that accounts for the activity of creation. Under such a conceptualisation a personhood of a creator seems to be unnecessary. It is easy to see how the principle of the *mahat* can easily be equated to that of the Supreme Being or God in later Yoga philosophy.

From *mahat* arises egoity (*ahaṃkāra*), a principle of individuation. Larson (1979, p. 186) points out that this egoity is not a personal sense of the self but a self-awareness that pervades all of the experiences including functions of the mind and senses (p. 186). From *ahaṃkāra,* a twofold creation takes place. The first consisting of the "group of eleven" arises from the sattvic *ahaṃkāra* consisting of the five action-senses (*karmendriyas*), the five intelligent senses (*Jñanendriyas*), and the mind (*manas*). From the tamasic form of egoity (*ahaṃkāra*), the five subtle entities, the pre-elements called *tanmātras*, arise. The *Yuktidīpika* equates the *tanmātra*s to the *pañcabhūta*s, but most other commentaries emphasise that the *tanmātra*s are not elements but potentials that could evolve into the elements.

The idea of *tanmātra*s is particular to Sāṃkhya. On one hand, this principle may have been introduced to evidence *satkāryavāda* doctrine by insisting that the elements pre-exist in the egoity as potential objects for the senses. The concept of *tanmātra* creates the link between the senses and the five elements in the Sāṃkhya school.

The mind and the 10 senses of grasping, or *indriya*s, constitute the instruments through which an embodied *puruṣa* experiences the external world. The senses created from *ahamkāra* at this point of evolution are not the end organs or embodied senses, but they are senses in their potentiality. Similarly, the *tanmātra*s are also intangible potentials. *Tanmātra* can be translated as "only so much" (Larson 1979, p. 187), or "measure of that much". Dasgupta (1987 p. 251) translates this as "potentialities".

Dasgupta (1987) points out that the derivation of the *tanmātra*s from *ahaṃkāra* has been considered by many Western scholars (p. 85) as the derivation of matter from ideas and thoughts. He argues for the materialism of Sāṃkhya evolutes by detailing the evolution of *prakṛti* into the five elements. According to him, each stage of evolution is not the creation of any new evolute but all are transformations of primordial *prakṛti* (pp. 85–86).

There are three stages of the evolution of the *tanmātra*s. The evolution occurs in stages that are called *bhūtadi*, *tanmātra*s, and *paramaṇu*s (pre-elements, subtle elements, and ultimate atoms. He writes that "the *bhūtadi*s are absolutely homogeneous with no qualities other than quantum…" (p. 86).

Seal (quoted in Dasgupta 1987, p. 87) suggests that *tanmātra*s are "infra atomic particles that are charged with specific potential energies". He understands the creation of each of these elements as a process in which each kind of *tanmātra* is charged with a particular form of energy that under suitable conditions form the respective atoms (*paramāṇu*). For example, the class of *tanmātra,* that is charged

with vibration energy, forms the ether or space atom. Similar is the case with the classes of *tanmātras* that are charged with other energies that form the atoms of earth, water, fire, and air.

One can creatively suggest that the potential of "just-that-much" sound leads to the formation of its locus, the *akāśa*. And the potential of "just-that-much" smell leads to the formation of its locus, the air.

The *Yogasūtra* also mentions the elements as having different aspects during the description of focused meditative practices. Based on the idea of *Satkāryavāda*, the *Yogasūtra* advocates that the meditation on the past, present, and the future forms of the element would lead to the development of victory over elements. The *sūtra* iii.43 says: "Victory over the elements is achieved by *Saṃyama* (concentration) on the gross, essence and subtle form and the recurrence of *Guṇa*s" (trans. author, from *Yogasūtra* 1976).

The gross form of the element is one of the aspects in which the elements are found in combination with each other. The second aspect of the element is the special or its essential property, such as heat in the fire. The third aspect of the element is the *taṇmātra,* the material cause of the element during evolution. The *Yogasūtra* commentaries claim that the *taṇmātra* is a kind of generality that manifests itself as many particularities called *viśeṣa.* For example, if sound is the *taṇmātra* for the space, the different notes are particularities.

Sāṃkhya interprets the entire universe as being geared to be available to the apparent experience of the *puruṣa*. The sensations and their potentials lead to the formation of a tangible world. Again as Dasgupta (1987) in his study has affirmed, this is not a theory of psychological creation where the material arises from the immaterial. Rather in this step of the transformation of *prakṛti*, the link between the outer world of experience and the inner world of senses is established. The simultaneity of the sense and the sense object potentials creates a common ground that is important for an explanation of how the senses function efficiently. Each sense seems to lock on to its own object and is unable to grasp other objects of other senses. What forges the link between these senses and their objects? According to the *Satkāryavāda* doctrine, while the link between the different objects and the experience as a whole is ascribed to the mind, it seems that for the Sāṃkhya philosophers, the sense—sense object fit is possible only if they both have arisen from the same kind of material.

From a particular perspective, without subscribing to Cartesian dichotomies (that are absent in Sāṃkhya), one might understand the evolution of the potential *tanmātras* and the disembodied sense potentials as a kind of divisive conceptualisation of the subjective and objective entities. The difference between *sattva* and *tamas* predominance is used to separate the instruments of cognition—the group of eleven senses—from the *bhūtadi*, the precursors to the material created world. Both of these are evolutes of *prakṛti* differing only the aspect that gives rise to them while the *sattvika ahaṃkara* creates the grasper or experiencer, the *tāmasika ahaṃkara* transforms into the experienced nature or the objective world of reality.

From the Sāṃkhya view point, both these evolutes of *prakṛti* are *jada* or unconscious (thereby they are not strictly subjective and objective divisions of the

world). The sentient *puruṣa* is also not a subject but is made a reluctant subject due to the activities of *prakṛti*. *Prakṛti*, on the other hand, is unconscious and is made active in the presence of the *puruṣa*. A metaphor of reflective capacity of the different evolutes would help clarify the position of the group of eleven and the *bhūtadi*. One could say that the evolutes of the *sāttvika ahaṃkāra* reflect the sentience of the *puruṣa* better, while the tamasic predominance makes the *bhūtadi* almost opaque, and hence, they occur as insentient (*jada*). True nature as *prakṛti* is essentially *jada* and all the sentience we find is a reflection of the *puruṣas*. This argument falls into the general theory of reflected *puruṣa* in the sattvic predominant *citta*, a much discussed topic in the theory of *Yoga*. The implications of this for the conceptualisation of nature are very interesting. Nature as material and insentient is its essential form, and the sentient part of beings, including the human beings, is actually "non-nature" as they in their embodied states are reflections of the *puruṣa*.

Many of the earlier Sāṃkhya texts just mention that the five *mahabhūta* give rise to the gross elements called the *pañcabhūtas*. This transformation of the *tanmātras* into the material elements takes place through a particular process often called in later texts as *pañcīkaraṇa*. Later Vedānta philosophies adopt these explanations into their doctrines.

Each element in the subtle form as *mahābhūta* first divides itself into two equal halves. The element retains one half of itself, and the other half is distributed to the other four elements in equal portions. Each gross element therefore is constituted of one half of its *mahābhūta* form, and one eighths of the other four elements. The gross elements make up the known objects of the world.

4.6 Elements in Nyāya and Vaiśeṣika Schools of Thought

Though Nyāya and Vaiśeṣika schools are syncretised in many respects, when it comes to the theory of change, they have two different perspectives. Therefore for clarity, in this particular section, we shall treat them as two individual and different schools of thought.

The elements in both Nyāya and Vaiśeṣika philosophies are necessarily connected with a sense faculty. The Nyāya school defines *bhūta* as that "which has a specific property that can be grasped by an external sense organ". As we have seen earlier, things or *dravyas* are made of atoms of different elements. The elements (*bhūta*s) are described as five in the *Nyāya Sūtra*, 1.1.13: "The material substances are Earth, water, fire, air and space" (p. 2430, trans. Jhā 1950).

The classification of the elements in the Kaṇāda's *sūtra*s (Vaiśeṣika school) begins with a description of their properties summarised from *sūtras* II. 49–53 (trans. Chakrabarty 2003, p. 49):

> There are no qualities in the *Ākāśa* (space), *Vāyu* (air) is touchable, while fire has both *rūpa* (colour/form) and touch. Water has *rūpa* (colour/form), touch, taste and fluidity and smoothness. The element that has all the qualities of water and also odour is earth.

Kaṇāda points out that the specific property of each element is its mark (*Liṅga*). The mark in Indian philosophy is something that distinguishes one object from another. Hence, the distinctive mark of the five elements is the presence of these properties. Since the properties are related to particular senses, it would not be wrong to say that the world is made of objects that are effable and knowable, particularly through the senses. Kaṇāda says in *sutra* ll. 1. 8–7 (Chakrabarty 2003, p. 50):

> Horns, hump, hair at the tip of its tail and a dew lap are the visible signs of a cow. (Similarly) touch (is the sign) of *Vāyu* too. And this touch is not of the visible (things) hence *Vāyu* has an invisible mark.

Sharma (2000, p. 177) summarises:

> The peculiar qualities of earth, water, fire, air and ether are smell, taste, colour, touch and sound respectively which are sensed by the five external senses. The external senses are constituted by the respective elements whose specific qualities are sensed by them—the sense of smell is constituted by the element of earth and so on. The elements are the substrata of these qualities.

The various elements are said to be the material causes of the sense organs. For example, the visual organ is made of light (fireFire) and the tactual organ is made up of air (Sinha 2006, p. 424). Each element has one specific property that can be grasped by the senses. Since these properties are deeply related to the particular object of the senses, one could suggest that for the Nyāya and Vaiśeṣika philosophers, the experienced world is a sense-grasped world, where the senses distinguish between the different elements. The senses would also help us know the elemental composition of a particular *dravya*. For instance, anything with smell would necessarily contain the earth element and those with taste would contain the water element and so on.

Both Nyāya and Vaiśeṣika schools posit that *dravya*s can be made up of the combination of different elements because we can perceive the same object with more than one sense faculty. This is why we can sometimes "see" air that is coloured or "smell" water. For *Sāṃkhya* philosophy, the transformation of subtle to gross elements through *pancīkaraṇa* creates a sensible world. For the NV school, the composite combination with a predominant element creates sufficient magnitude of the atoms that are available to sense perception.

The properties of fire are important for the Nyāya school. How does the cooking of atoms produce a new substance? Fire becomes an element that has the capacity to change and substitute new qualities. Fire is also classified into four types based on its qualities (Sinha 2006, p. 384):

1. Fire manifested with touch and colour as properties, such as the sun and the flame.
2. Fire that cannot be seen but only available to the touch sense, such as in hot liquids and objects.
3. Fire with colour, visible but with no manifested touch. This is like the light from a lamp, (though the actual flame is of the first kind). Sunlight is also not this kind as it is warm and can be felt by touch.

4. The sense organ of the NV school is a special case as it is made up of the fire element but is not available to either sight or touch. The peculiarity of air and space is that they do not inhere in other *dravya*s.

The Vaiśeṣika account of elements suggests that the elements in their most fundamental form are *paramāṇu* or eternal atoms. These atoms combine to form composite wholes that are more than the sum of the parts. Both the Nyāya and Vaiśeṣika schools ascribe eternality to the atoms of the Earth, water, fire, and air. The composite forms of these elements are not eternal. Nyāya and Vaiśeṣika admit the reality of space as an external element (Sinha 2006, p. 402). Space is a special element that is eternal. For the Vaiśeṣika school, air and space are eternal because they do not inhere in other *dravya*s (*Kaṇāda Sūtra*s, II.1.61, II.1.76). As we noted in an earlier chapter, a *dravya* whole can inhere in other *dravya* parts. Since air and space are partless, they do not have parts nor can they form composites. Where ever we find air or space, other elements are not present. They are in "contact" (*sannikarṣa*) with other substances and also as in the case of multiple forms of air, with their own kind (*Kaṇāda Sūtra*s, II.1.62–63). Each of the atoms of the elements is possessed of the respective *jāti* (genus). For instance, the genus earth inheres in the earth element and so on. Earth atoms are responsible for formation of different types of bodies, including the human body. Nyāya and Vaiśeṣika schools posit that there are two kinds of bodies, those born of sexual union and those that are born of elements in combination with merits and demerits. Among the former, some bodies are born of a womb, others of eggs. Divine bodies and minute bodies are the latter kind (Sinha 2006, p. 383).

All tangible solid objects such as earth, stone, and plants that can be touched and also have odour are included under the earth category. In some texts, there are beings described as having elemental bodies, in combination with earth such as water-bodied and fire-bodied beings. There seems to be a similar idea in Jainism. As mentioned earlier, each one of the elements has a special property that is perceived by the respective sense organs.

4.7 Atomic Theory and Theory of Change: *Pākavāda*

The Nyāya and Vaiśeṣika schools consider the small, uncreated eternal substances as *aṇu* or atoms. Earlier Vaiśeṣika schools believed that all perceptible entities could be destroyed because they were formed by composites. Nyāya and Vaiśeṣika schools differ on the theory of composite formation.

According to the Vaiśeṣika school, atoms are too small to be seen within the threshold of perception. The *Kaṇāda Sūtra*s (VII.1.8–9, p. 89) explain the two orders of magnitude and existence: *aṇutva* (atomicity) and *mahattva* (greater magnitude). The *paramāṇu* of atomic magnitude are eternal and imperceptible to the senses; the essential qualities of these elements atoms are also eternal, such as "earthness" or "waterness". The qualities of the created composite *dravya*s are not

eternal, because the *dravya*s themselves are non-eternal (*Kaṇāda Sūtra*s, VII.1.4–5, p. 88). How does the change in these composites occur?

The *sūtras* seem to have a strong empirical foundation. They next describe that some earth-like materials such as beeswax and lac become fluid when in contact with fire. The importance of things being transformed by fire is explained as a way in which newer composites of materials are created. For this, Nyāya and Vaiśeṣika schools have different explanations. Anything that is heated by fire is called *pāka* or cooked. Kaṇāda says (in *sūtra* VII.1.6, p. 89)

> *Kāraṇguṇapūrvakāh pṛthiviyāṃ pākajāḥ*
> The cause of the earlier qualities are reproduced from the cooking in the earth (trans. by author).

The illustration is that of an unbaked black clay pot being "cooked" by the fire and changing all its properties and becoming red, baked, and capable of holding water. How do the transformations of the properties take place? The Vaiśeṣika school hypothesis is that the change occurs at the level of the *aṇu*, the atoms constituting the pot. Fire (by cooking) destroys the transient or non-eternal properties of atoms (such as the black colour), the eternal substance or the *dravya* atoms with their eternal properties continue to persist. When the heat produces a new set of properties in each atom, such as the red colour, they recombine to form the pot with the red colour and a new set of non-eternal properties (Potter, p. 84). This is known as *pilupākavāda* the (cooking of atoms) of the Vaiśeṣika school. In contrast, the Nyāya school proposes the *pitharapākavāda* (cooking of pot) hypothesis. According to this theory, it is not necessary for the changes to occur at the atomic level. The pot itself can undergo change and composites can also gain new properties.

This chapter has focused on two main themes through the discussion on elements. Firstly, after the basic description of the origin of elements, change and evolution of these elements and their relationship to each other in nature have been described in Indian philosophy. Secondly, the two theories of change demonstrate the concept of change in nature. The idea of fundamental elements that constitute nature creates the "few to many" problem. How do basic constituents contribute to the wide variety of materials in the world? And is there an intelligent cause required for this process? How does the transformation of substances occur in nature? These are some of the observations from some philosophical schools that were discussed in this chapter.

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