

A COMPARATIVE STUDY OF THE EARLY SYSTEM OF INDIAN COSMOLOGY AND THE TRIDOSA HUMORAL DOCTRINE

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While analysing the universe the ancient thinkers ultimately came to recognize five cosmic elements. Likewise in the make up of man the corresponding basic constituents were called humours. And both seem to have been formed on the same pattern so much so that the universe was called macrocosm and man microcosm. It is obvious that between the elements of macrocosm and the humours of microcosm there was perfect concordance. Now in Greek cosmology there are five elements and likewise in the Indian, and the writer who first made their comparative study was Colebrooke. There is however a slight difference in the arrangement of elements as seen below :

Indian : *Ākāśa*, Wind, Fire, Water and Earth.

Greek : Aether, Fire, Wind, Water and Earth.

Colebrooke's main contribution in such a study was to equate, *Ākāśa* = Aether. Boethlingk¹ however objects to such an identification. Quoting Colebrooke himself he maintains that, "The (Indian) ethereal element, *Ākāśa*, is deemed to be a *most subtle fluid* occupying space and vacancy". Apparently, according to Boethlingk, such an attribute would not qualify Aether. However in nature there is no vacuum and the human mind imagines that, where the atmosphere ends, above it, there would be something like super-air, as the most subtle form of matter to be called *Ākāśa*. But this would be a thoroughly static view of *Ākāśa*. Fortunately Boethlingk tried to trace the origin of the Greek idea of Aether to Pythagoras. From the latter he translates a sentence meaning that, "the fifth element is that which sets the world globe into movement". This would be a dynamic view of Aether, as distinct from its static, as subtle fluid, which thereby makes it the foremost cosmic element. When this is admitted, as qualifying aether, *Ākāśa* has also to reveal a corresponding dynamic power which obviously Boethlingk did not expect.

On the Indian element, *Ākāśa*, Divanji² has published a study entitled,

"*Brahma-Ākāśa equation.*" On p. 150, he writes that, "from *Ātman Ākāśa*, was produced," and as expected, on p. 151, he explains that, "*Brahman* is identical with *Ātman*." He therefore legitimately concludes that, *Brahman* produces *Ākāśa*. In fact he could quote an authority affirming that, "*Brahman* has *Ākāśa* for its body." Likewise, on p. 160, he cites from *Guḍapada Kārikā* that, "*Brahman* resides in the *Ākāśa*." Finally Śaṅkara says that, "all the created beings have been produced from the *Ākāśa* (and) go back to it, being the highest goal." This makes *Ākāśa* the fountain of Creative Energy when a fraction of it would suffice to set the world globe into movement, which Pythagoras attributed to Aether. Moreover Deussen⁸ quotes from *Chāndogya Upaniṣad*, 1.9.1, that, "it is *Ākāśa* out of which all these creatures proceed and into which they are again received. *Ākāśa* is older than all, *Ākāśa* is (also) the ultimate end." The above statement of Śaṅkara seems to be a restatement of *Chānd. Up.* which then fully confirms, *Ākāśa*=*Brahma*, and *Ākāśa* as cosmic element, represents creative energy.

Now it would be interesting to find the counterpart of *Ākāśa* in Chinese cosmogony. In Chinese *Chhi* would be soul, as energy-cum-matter. *I-Chhi* would be, the One-Soul, the universal soul, the Cosmic soul. Dialectally it is *Ek-Chhi*. This was Arabicized as *Ik-Si-(R)* and gave the word *Iksir*, Elixir, as explained⁴ before. With regard to *I-Chhi* or *Chhi*, Edkins⁵ informs that, "a Taoist priest denied that creation was God's act and maintained that it was the act of the material agent which he called *Chhi*, meaning a very pure form of matter." Thus if *Chhi* is "pure form of matter," it identifies itself with *Ākāśa* as, the "most subtle fluid", while by their function, they would be creative energy, when briefly, each is to be looked upon as matter-cum-energy. With regard to *Ākāśa*, Colebrooke has established its nature as, subtle fluid, or as matter, while Divanji has identified it with *Brahma*, best conceived as creative energy. *Chhi* then would be the equivalent of *Ākāśa*, as matter-cum-energy, which can create all forms of matter and all forms of energy. But *Ākāśa* is a cosmic element in Indian Cosmology, while *Chhi*, or *I-Chhi*, in Chinese cosmology is not. At any rate by now we are in a position to vindicate Colebrooke rendering *Ākāśa*=Aether.

While interpreting *Ākāśa* and Aether, Colebrooke and Boethlingk seem to have taken different stand-points. The view Boethlingk took was perhaps the same which Deussen assumes while comparing the Indian and Greek Cosmic elements. Deussen (p. 189) writes that, "like the Greek philosophers most of the Indian thinkers distinguish five elements, ether, wind, fire, water and earth. A dependence, however, of the Greek idea on the Indian or the Indian on the Greek is not to be thought of for the order of elements is

different. The Greeks place Fire between Ether and Air, the Indian Air between Ether and Fire. On both sides simple observation of nature led to the thought of the five states of matter, *solid, fluid, gaseous, permanently elastic* and the *imponderable* as the five component parts of the material universe to which correspond the five organs of sense." Such a theory results on studying nature as a physicist, whereas the Indian thinkers were moral philosophers in the first instance. Apart from it how would Deussen explain that, in Chinese cosmology, there are the elements Metal and Wood, with neither aether nor air. Moreover *Chând. Up.* speaks only of three cosmic elements when civilization was advanced enough at the time for the observers of nature to have recognized five states of matter. The only conclusion we can draw here would be that the cosmologists of *Chândogya* period were not disinterested observers of nature.

Let us then explain how *Chând. Up.* could limit cosmology to only three cosmic elements. Deussen (p. 113) informs that, "as early as the period preceding the *Upaniṣads* the first principle of the universe was regarded as inherent in the Sun." "Later it was no longer the Sun but *Puruṣa* (Spirit) in the Sun." (p. 114). Here the Chinese equivalent of "*Puruṣa* in the Sun" "would be "*Chhi* of the Sun." Then the "Spirit of the Sun" can be admitted to be the heat and light energy which together make the plants grow. Moreover Deussen (p. 185) quotes *Chând. Up.*, 6.2.3, according to which "first was created heat, from heat water proceeds, from water food, i.e. the earth." Thus *Chând. Up.* recognizes only three cosmic elements, Heat, Water and Earth, the last as producer of food. With importance having been attached to the Sun, which is the source of heat, recognized long before the *Upaniṣadic* period, we can realize how heat has been assigned priority over water and earth. Heat alone represents energy, while water and earth are forms of matter. We have now to find the origin of a system of cosmology limited to these three elements.

When Aryan nomads took to agriculture they became deeply interested in the basic factors necessary for plant life. Sun is the source which makes every thing grow. Its emblem on earth has been Fire, while heat has been accepted as its predominant quality. We would easily admit that plants cease to grow in winter and need warmth for their growth. Then comes water without which plant life is impossible and most fertile lands are those which are irrigated. The early man had noticed this dependence of plant growth upon water and water had been accepted as the source of life. Deussen (p. 190) explicitly writes that, "the oldest element with the Indian is water. In *Rgveda*, X. 121.9, Prajāpati begets the great sparkling waters".

Likewise Quranic cosmology admits life arose from water. Thales among the Greeks has emphasized the idea of water as the source of all creation. But *Chānd. Up.* 7.10.1, already stated that, "this earth trees and ants (as representing creation) are nothing but this water under solid conditions." This would lead any one to believe that, what Thales has propounded, could be legitimately traced to *Chānd. Up.*

Finally comes the quality of the soil and every farmer recognizes how some lands are arable and others not ; this gives Earth as the third cosmic element. Air, so indispensable to human life could never be reckoned as essential for farming. Hence for an agriculturist the three elements for growing a food-crop would be, Heat, Water and Earth, but neither air nor ether. Thus arose the three elements of the earliest cosmological system. Now of these three elements Earth and Water constitute the material out of which a life-form originates, and this can be a plant, an animal, or man. But to impart life itself comes heat. And we know that even plants require warmth for vegetative growth which is at a standstill during winter. Here we have to transplant ourselves in the time when agriculture was introduced and began to advance rapidly. The Aryans had been pastoral people and nomads before. But once they took to cultivation, their heart and soul went to see that their labours on the farm bear proper yields. Concentrating their mind on plant growth they discovered the elements responsible for this phenomenon. As a result there arose the three elements given in *Chāndogya* cosmology.

Ackerknecht⁶ records an observation on physiology as conceived by ancient Egyptians. He writes that, "one pondered over the way the human body functioned, i e. over physiology. In spite of the fact that many corpses were opened up in order to be embled. anatomy was unknown, which explains why Egyptian physiology, far from reflecting the human body, rather mirrors Egyptian agriculture with numerous irrigation channels, with the mind directed to crop production. While the Egyptian conceived human physiology as "mirroring Egyptian agriculture," the Aryan of the *Chāndogya Up.* conceived cosmology, as mirroring Indian agriculture. With such a background we expect a comparative study of cosmic elements and of humours would show intimate connection between the two.

Kashikar's⁷ translation of Jolly's work states that, "according to Caraka, the body is the product of five gross elements under the guidance of soul (as creative energy). If the balance or the elements are disturbed the body suffers or expires." Now the body comprises of three humours while the

above cosmology speaks of five elements. A corresponding discrepancy is found also between five cosmic elements in Greek cosmology and four humours in the Greek humoral theory. This is being explained later. For the present it is to be noted that the cosmology of *Chānd. Up.* comprises of three cosmic elements and their author appears to have been at heart a farmer. The three cosmic elements have to be raised to five, to explain macrocosm properly and also microcosm, as conceived by Caraka cited above. We may assume that the *Chānd. Up.* was composed about 800 B.C. while the *Tridoṣa* doctrine was virtually compiled by Pāṇini who lived about 500 B. C.

Agrawala* informs that it is "Pāṇini (who) just mentions the three humours of the body, for the first time together, viz. 1. *Vāta*, wind ; 2. *Pitta*, bile ; 3. *Śeṣma* (*Kapha*) phlegm." Bile would correspond to heat, and phlegm to water. It will be observed that when Pāṇini compiled the *Tridoṣa* doctrine the individual humours constituting it, particularly heat and water, were already recognized as important. Nevertheless Indian cosmology claims five cosmic elements while the *Tridoṣa* doctrine only three humours.

When we consider the origin of the three elements of *Chāndogya* cosmology we realize that it was the contribution of a farmer, as thinker, and naturally his observations cannot explain the humours characterizing the human system. We may therefore explain the *Tridoṣa* doctrine independently and see how far the elements, basic to plant life, are shared by human life. Again while in Greek cosmology there are five cosmic elements in its humoral doctrine there are only four humours. It was therefore necessary to explain the difference between the make up of macrocosm, with five elements, and the maintenance of microcosm, with only four humours. The present author⁹ has shown that creative energy as *Ākāśa* or as Aether was disseminated among the other four elements. The result was that the other four cosmic elements, which were hitherto inert, were activated by the creative energy donated by *Ākāśa/Brahman*. The four cosmic elements then, as activated elements, could thereby combine among themselves as required. When we focus attention on *Ākāśa*, we can realize how *Ākāśa*, Sky, was equated with the Sun, a source which makes every thing grow. From the Sun can be abstracted its quality Heat which would be directly useful in crop production. This explains the priority assigned to Heat in *Chāndogya* cosmology.

When we now turn to the *Tridoṣa* doctrine the first humour of importance is *Vāta*, Wind. For man breathing is of greatest significance. In fact there are words implying, to breath = to live. Then for human life air is most important which thus assigns *Vāta*, Wind, priority in the *Tridoṣa* doctrine. Now cases are known as of drowning, when breathing had stopped, but

ultimately life did return. But once the body becomes cold it is a definite sign of extinction of life. Thus heat comes next to wind as the essential constituent of the *Tridoṣa* doctrine, being called *Pitta* as humour. Without water life is impossible and Water, as humour, is conceived as *Kapha*, or phlegm. Thus when we analyse the conditions essential to human life its dependence upon elements, called Humours, follow exactly the order as discussed above coinciding with the order assigned to them by the *Tridoṣa* doctrine, as *Vāta* (Air) first, *Pitta* (Heat) next, and *Kapha* (Water) last.

I have discussed the four Humours recognized in the Greek and Unani systems of medicine. They explain the maintenance of life, not its creation. I have also ventured to justify them scientifically¹⁰. Life processes can be reduced to four biochemical reactions, oxidation and reduction, and hydration, as two pairs of reactions. As individual humours I have equated Air=Oxidation; Earth=Reduction; Water=Hydration; Fire=Dehydration. Later it has been explained¹¹ that water alone, when ionized, can produce radicals responsible for the above biochemical processes. $H_2O = H^+ + (OH)^-$. Now 2 (OH) can give H_2O_2 or hydrogen peroxide, and $H_2O_2 = H_2O + O$. Thus from water we get three radicals, H, O, and OH. Now it is observed that iron for example does not rust or get oxidized unless there is a trace of water; pure oxygen does not oxidise iron. The presence of hydroxyl ion, OH, seems to be necessary for oxidation. For reduction, on the other hand, hydrogen ion, (H), alone is sufficient. Then with the three radicals we can conceive three biochemical processes as follows: (O) for oxidation; (H) for reduction, (OH) for hydroxylation, which is also an accessory for oxidation. There is no special radical necessary for dehydration, because accelerated oxidation would automatically result in dehydration. Then for oxidation hydroxyl ion (OH) is to be denoted by water. Had this dependence of oxidation upon hydroxyl ion not been established we could have overlooked considering the presence of traces of water for oxidation. This role of water makes it the source of hydroxyl ion (OH). For reduction, on the contrary, the presence of (OH) ion is not essential. Thus we can simplify the biochemical reactions as being dependent upon three radicals, O, H, and OH, or as directly responsible for oxidation, reduction and hydroxylation.

We have now to interpret the humours of *Tridoṣa* doctrine. *Vāta*, Wind, is responsible for respiration. It means oxygenation of the blood, with oxidation and reduction properly synchronizing. Biochemically it means the radicals (O), (H) and (OH) all are acting as they should, without producing much heat. *Pitta*, Heat, is the next humour. When reduction is checked or the enzymes oxidases, as such activated, oxidation results with greater generation of heat. *Kapha*, or Phlegm, is the aqueous principle depending upon hydroxyl

ion, (OH). There are special enzymes which introduce (OH) ion or hydroxylate a biochemical system, as prerequisite of dehydration. This can be brought about by accelerating oxidation without the simultaneous increase in reduction. Such would be the result of interpreting the humours of the *Tridoṣa* doctrine.

SUMMARY

Observing plant life it was found dependent upon Solar energy, Water and Soil. As cosmic elements these were conceived as Heat, Water and Earth. *Chāndogya Upaniṣad* recognizes such a Cosmology.

Human physiological functions are mainly constituted of Respiration, of body Temperature, and of intake and elimination of Water. As factors of human physiology, called humours, they become *Vāta*, Wind or air; *Pitta*, bile or Heat; and *Kapha*, phlegm or Water, and they give rise to the *Tridoṣa* doctrine.

Vāta, wind, would be oxygenation, with oxidation and reduction operating together. *Pitta*, Heat, would result on oxidation being accelerated with reduction relatively checked; heat would thereby be generated. *Kapha*, phlegm, is the aqueous principle adding water to some substances for being processed further. Biochemically it means hydroxylation. It is prerequisite also of oxidation, normal or accelerated. Dehydration is not conceived as an independent process. Accelerated oxidation can produce extra heat which can bring about dehydration of a metabolite.

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