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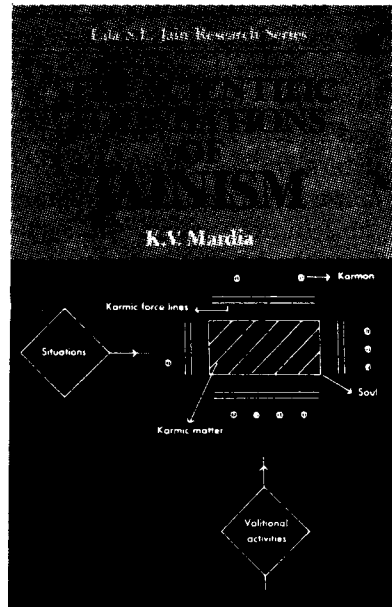
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## Book Review



MARDIA, K.V., *The Scientific Foundations of Jainism*, Motilal Banarsidass Publishers Pvt. Ltd., Delhi, 1990. Pages xix+121. Price Rs. 85.00 (paper) ; Rs. 140.00 (cloth).

Jainism is a religious system of great antiquity. Jain tradition traces its origin back through almost limitless time. Certainly the most sceptical cannot deny its nearly 3000 years of history. In that time, of course, it has not stood still. Generation after generation of scholars have added and commented and explained, so that the total mass of written Jain scholarship is vast indeed and growing vaster with every year that passes. I have always maintained, since I first began my own amateur study of Jainism, that its principles accord well with modern science. Jain thought, Jain philosophy is timeless. However, the ancient texts are written in the languages of their particular time and their ideas are expressed in terms of the scientific vocabulary of their day. These are written in languages, Sanskrit and the Prakrit, which are well-adapted to give precision and clarity to abstruse and difficult ideas, though not infrequently they can be difficult of interpretation owing to extremes of terseness or of repetitiveness. The terminology can be difficult, and a modern book on any aspect of Jain thought will be littered with and often rendered almost incomprehensible by, untranslated technical terms for which no concise modern equivalent has been sought or found.

Professor Mardia is a very distinguished scholar in a very exacting science. He is a mathematician, or more properly a statistician. He is also a devoted and practising Jain. Thus he is particularly well-qualified to approach the task of rendering the basic principles and philosophy and ethics of Jainism in the terms of modern science. His book divides naturally into three parts. First he explains the basic ideas of the soul, *karma*, living beings and non-living matter, and brings these together in the Jain explanation of life and death and the universe. Next he moves from the general to the particular, to the practice of self-conquest and the path of the individual soul towards purification. Thirdly, in two chapters which demand, and reward close reading, he places Jain logic in its rightful position as a valid and acceptable system, and draws, together the most fundamental and up-to-date aspects of modern physics with the scientific theories of the Jain writers. It will, I am sure, be of value to Jains living in the modern world who often find it difficult to discern the relevance of the writings of long-dead authors to the world today. It will also be of value to non-Jains, particularly those who approach the study of a little-known religion in a spirit of rational inquiry.

—Paul Maret  
Loughborough University, U.K.

## Books Received

BHOGILAL, MAHESH, *Vācaka Srimad Umāsvāti's Praśamarati Prakaraṇa*, Nita M. Bhogilal, Ahmedabad, 1989. Pages xiii+148.

English translation of Vacaka Umasvati's *Praśamarati Prakaraṇa* with Preface and Appendices. Edited by V.M. Kulkarni.

CHORDIA, JETHMAL, *Jambū Guṇaratnamālā evam Anya Racanāyen*, Champalal Chordia, Jaipur, 1989. Pages xix+135.

The well-known story of Jambusvami in verse and other poems.

JAIN, DULI CHANDRA (ed), *Studies in Jainism*, Reader 1, Jain Study Circle, Inc, New York, 1990. Pages 90.

Most of the material has been adopted from Jain Study Circular and is meant for new Generation of Jains who are born abroad.

MAHOPADHYAY CANDRAPRABHASAGAR, *Adhar mein Latkā Adhyātma*, Sri Jityashashri Foundation, Calcutta, 1990. Pages 76. Price Rs. 7.00.

A collection of verses.

MAHOPADHYAY CANDRAPRABHASAGAR, *Kharatara Gaccha kā Adikālin Itihās*, Akhil Bharatiya Sri Jain Svetambar Kharatara Gaccha Mahasangh, Delhi, 1990. Pages 13+242. Price Rs. 30.00.

Early History of Kharatara Gaccha from Jinesvara Suri to Jinesvara Suri II. Edited by B.L. Nahata.

NAHATA, BHANWARLAL, *Sri Sahajānandaghana Cariyam*, Prakrit Bharati Academy, Jaipur, 1989. Pages xvi+101. Price Rs. 20.00.

Life of Sri Sahajanandaghana Maharaj in Apabhramsa verse.

SANGAVE, VILAS A. & OTHERS (ed), *Pt. Jaganmohanlāl Shāstrī Sādhuvād Grantha*, Pt. Jaganmohanlal Shastri Sadhuvad Samiti, Rewa, 1989. Pages xv+117+458. Price Rs. 201.00.

Felicitation volume containing articles on Jainology.

# Jain Theory of Measurement and Theory of Transfinite Numbers

NAVJYOTI SINGH

In ancient Greek thought the idea of finitude and the idea of order were intrinsically related. What characterised *cosmos* was its determinateness, order and finitude<sup>1</sup> and opposed to it *chaos* was characterised by indeterminateness, infinitude and disorder. Greek term for infinite, *apeiron* (lit. 'unbounded') meant anything that is disordered and infinitely complex like an arbitrary crooked line or a dirty crumpled cloth or an infinitely large entity.<sup>2</sup> *Apeiron* was by its nature subject to no finite determination. This was a tradition that associated failure of cognitive faculty and lack of determinateness with infinity. Contemporaneous ancient Indian Jain tradition evolved a unique perspective in which infinitude and finite determinateness were not antithetical.<sup>3</sup> Jain *Āgama* literature abounds in the use of terms *ananta* (infinite) and *asamkhyāta* (innumerable) for qualifying properties of elements of *cosmos* (*loka*) and universe (*loka* and *aloka*). Their *loka* embodied in its folds infinite material monads (*ananta pudgala paramāṇu*) and infinite souls (*ananta jīva*). *Loka* itself had a spatial extension of innumerable space points (*asamkhyāta pradeśa*) and interesting enough, each of the infinite souls in it also had spatial extension of innumerable space points. Innumerable part of *loka* could be infinitely dense containing infinite infinitesimal material monads and innumerable souls. Time was constituted of

<sup>1</sup> This understanding of *cosmos* is common to ancient Ionian as well as Melesian cosmogony and to later Pythagoreanism, Parmenidean philosophy, Platonic philosophy and Aristotelian philosophy. Pythagoreans thought that finitistic natural numbers were the principle of the world. Aristotle gave philosophical foundations for a finitistic universe by making a distinction between actual infinity and potential infinity and denying existence of actual infinity. This Aristotelian foundations of finitistic universe is still upheld by intuitionistic philosophy of contemporary mathematics. See Michael Dummett (1977) *Elements of Intuitionism*. Oxford : Clarendon Press.

<sup>2</sup> Rudy Racker (1982) *Infinity and the Mind*. Sussex : Harvester Press, pp 2-3.

<sup>3</sup> In the Indian tradition except for the Jains and in the western tradition till around nineteenth century such a possibility was not accepted. It is only in late 19th century that George Cantor created theory of infinities in the west, transcending Aristotelian thesis that such an exercise is futile. P. Jourdain (1985) ed. *George Cantor : Contribution to the Foundation of the Theory of Transfinite Numbers*. New York : Dover.

infinite moments as was entire space constituted of infinite space points. Large part of Jain cosmology deals with finite determinations of these various infinities, innumerables, infinitesimal and innumerable quantities and their relations. Fascinating aspects of Jain thought is the theory of number evolved for the purpose. Notion of transfinite number, detailed consistent hierarchy of transfinities and valid operations on them were developed.<sup>4</sup> However there exists confusion on genesis and content of various facets of this theory of number. What exactly necessitated three-fold classification of numbers into *samkhyāta* (numerable), *asamkhyāta* (innumerable), and *ananta* (infinite) and their further classification into 3-fold, 6-fold, 9-fold, sub-classes respectively? Were *asamkhyāta-s* and *ananta-s* really understood as transfinite numbers or as large finite numbers? How exactly hierarchy of these numbers and valid operations on them were evolved? Whether this theory had internal consistency? What were major turning points and issues of debates within this theory?

These are some of the questions being dealt in this paper. Particular issues of confusion are identified and resolved and logical genesis of Jain theory of number is recreated. It is our contention that proper understanding of content of Jain transfinite number theory is possible only in the wider context of Jain thought, in particular Jain ontology and what we have called elsewhere Jain theory of measurement. Jain theory of measurement dealt with physical 'actual infinity' and mathematical determination of hierarchy of these actual infinities was sought though there remained a discord between notion of physical actual infinity and transfinite numbers. A confusion in Jain texts regarding infinitude of term *asamkhyāta* is due to this discord. In the first section of the paper an attempt has been made to demonstrate that *asamkhyāta* and *ananta* were transfinite numbers. Good deal of Jain transfinite number theory is also outlined in this section. In section two attempt is made to understand theory of hierarchy of actual infinities and theory of transfinite number on the foundation of theory of measurement with a view to understand exact content and genesis of Jain theory of transfinite numbers.

<sup>4</sup> Such an attempt stands out as unique in Indian tradition and perhaps in the whole world before late 19th century. Nothing more than that 'all infinities are equal' could be said even by numerous approaches which regarded Universe as infinite or God as infinite. Jain theory of transfinities is outlined in pioneering work of A.N. Singh (1942) "Mathematics of *Dhavaḷa*" in ppi-xxi in *Satkhandagama* and its commentary *Dhavaḷa*, vol IV, *Ksetra-sparsana-kalanugame*.

*Are asaṃkhyāta and ananta transfinite numbers?*

It is our contention that *asaṃkhyāta* and *ananta* are used in the sense of actual infinity<sup>5</sup> in Jain literature dealing with cosmology. A physical notion of actual infinity need not imply a mathematical notion of actual infinity or a transfinite number.<sup>6</sup> A finite size physical object might be understood as comprising of infinite material monads but it is not imperative that such an understanding would lead to a notion of transfinite numbers. Jains did consider space, time, matter as comprising of infinite elements but did they really have a notion of transfinite numbers. *Dhavalā*, a treatise on enumeration of souls, states that the number which does not get exhausted by continuous subtraction of one after one is *ananta*.<sup>7</sup> Further *Dhavalā* states that number which is not exhausted by continuous subtraction even till endless time has been called *ananta* by great teacher (*maharṣi*).<sup>8</sup> This is a clear and exact formulation of notion of transfinite number called *ananta*. It is interesting to note that term *ananta* literally means 'un-ending' and it was used only in this sense in non-Jain literature but Jains gave it also a technical meaning of transfinite number or mathematical actual infinity.

Though it is clear that *ananta* is a transfinite number but such a clarity does not exist about *asaṃkhyāta* number. Confusion regarding exact meaning of *asaṃkhyāta* number is inbuilt in Jain literature and we would see later that this confusion stems from (a) confusion of mathematical and physical notions of actual infinity, (b) confusion in Jain thought on nature of time (*kāla*). Now we will elaborate on this confusion.

- <sup>5</sup> Notion of 'actual infinity' ; signifies an entity which actually is composed of infinite elements. As distinct from it 'potential infinity' means potentially infinite like natural numbers which can be counted on and on giving impression of being potentially unending or infinite but not of one entity which has infinite component numbers.
- <sup>6</sup> Mathematical actual infinity or transfinite number is like a number higher than all natural numbers. Such number would be beyond finite natural numbers hence is called transfinite numbers.
- <sup>7</sup> *Dhavalā*[III, p 267]/jo rasi egegaruve avanijjamane puna na samappaiso rasi ananto/ Also *Dhavalā* [III, p 25]/vaenitthantassa anantattavirohado/'which gets exhausted by subtraction is against nature of ananta'.
- <sup>8</sup> *Dhavalā* [IV, p 338]/sante vae na nitthadi kalenanamtaena vi jo rasi so ananto tti viniddittho mahesina/'that number which is not exhausted by continuous subtraction even till endless time has been called *ananta* by great teachers'. *Dhavalā* [IV, p 338]/so ananto vuccadi, jo samkhejjasamkhejjarasivvae santa anantena vi kalena na nitthadi/'ananta is that which by subtraction of *samkhyata* (numerable) and *asaṃkhyata* (innumerable) numbers for even till unending time is not exhausted'.



*Dhavalā* categorically states that *asamkhyāta* is a finite number as it characterises *asamkhyāta* as that number which is exhausted by continuous subtraction of one after one.<sup>9</sup> *Asamkhyāta* literally means innumerable and can be visualised as finite number that is ungrasped in number-naming scheme.<sup>10</sup> It could be a number which is outside the scope of elementary cognitive sphere in the sense that it can not be pronounced or written down numerically.<sup>11</sup> Jain thinker Nemicandra (9th-10th cent. AD) in fact defined *asamkhyāta* as a number equal to  $10^{140}$  and an early Buddhist source while enumerating base ten numeral system gives value of  $10^{27}$  to *asamkhyāta*, which was considered as a highest order word numeral.<sup>12</sup> Here we see that *asamkhyāta* is not only confused as unnamably finite but even as namably finite.

But if *asamkhyāta* is considered finite than Jain characterisation of *cosmos (loka)* as having *asamkhyāta* space-points (*pradeśa*)<sup>13</sup> seems pregnant with contradiction. A space-point by its nature is infinitesimal, in fact space less (*apradeśi*), according to Jain thought. One space-point is infinitesimal because it is a space occupied by an indivisible material monad (*puḍgala paramāṇu*) which is spatial-extension-less or *apradeśī*.<sup>14</sup> How can finite (*number of*) infinitesimals (*pradeśa*) constitute spatial extent of whole *cosmos* even if it is a bounded *cosmos*? Finite number of infinitesimals cannot make any extension. Besides if *asamkhyāta* is considered finite then even Jain understanding of time will become

<sup>9</sup> *Dhavalā* [III, p 267]/jo rasi egegaruve avanijamane nitthadi so asamkhejjo/that number which by continuous subtraction of one after one is exhausted is *asamkhejjo*.

<sup>10</sup> This understanding of *asamkhyata* was suggested by A.N. Singh (1942).

<sup>11</sup> In fact *Dhavalā* [III, p 268] gives epistemological characterisation of number typology of *samkhyata*, *asamkhyata* and *ananta*/jam samkhanam pamcimdiya-visao tam samkhejjam nama. tado uvari jamohinanavisao tamasamkhejjam nama. tado uvari jam kevalananasseva visao tamanantam nama/ 'that number which is an object of five senses is *samkhyata*. Above that the number which is an object of *avadhijnana* is *asamkhyata*. Above that the number which is an object of *kevalajnana* is *ananta*.

<sup>12</sup> A. N. Singh [1942], p XVIII

<sup>13</sup> *Dhavalā* [IV, p 22-24]. Also *Sthananga Sutra* [4-495]/cattari paesaggenam tulla pannatta, tam jaha-dhammatthikae, adhammatthikae, logagase, egajive/'four are comparable in terms of space points (innumerable)—dhammatthikaya, adhammatthikaya, akasa, and one jiva'.

<sup>14</sup> *Pravaeanasara* [25.4]

/jagha to nabhappadesatadhappadesa havants sesanam ; apadeso paramanu tenu padesubhavo bhanido/'just as there are points of space, so are there points of the rest (of *dravyas*). a primary material monad is without space-points, because (being an unit) it gives rise to the (measure of) space-point.' See even *Pravaeanasara* [2.71]. Also *Tatvarthasutra* [5-11] nanoh/'atom (primary material monad) has no space points'. *Puḍgala paramanu* and *pradesa* of *akasa* are considered indivisible part of *puḍgala* and *akasa*.

problematic. Moment of time, called *samaya* or *kālānu*, is considered as undergoing origination, permanence and destruction at one and the same instant and hence is considered infinitesimal.<sup>15</sup> Then how is it possible that finite number (*asaṃkhyāta*) of infinitesimal time instants (*kālānu*) make one measurable interval at time, *āvali*? Exactly same contradiction would come in the way of coherent understanding of *dravya-s* (principle of continuities according to Jains) which have spatial extension of innumerable space-points (*asaṃkhyāta pradeśa*), will not make any sense. Only an infinite conglomerate of infinitesimals can make an object with spatial extension or an infinite serial of infinitesimals can make an interval of time. This mean *asaṃkhyāta* will have to be understood as infinite to make sense of usage of *asaṃkhyāta samaya* or *asaṃkhyāta pradeśa* in cosmology.

If overlooking above argument *pradeśa* itself is seen as finite than *asaṃkhyāta pradeśa* will make a sense even if *asaṃkhyāta* is finite. Instead of translating *pradeśa* as 'space-point' it can be translated as finite 'space-region' but we will have to overlook that part of Jain cosmological tenets which describe it as infinitesimal. But even such an understanding would lead to discord with Jain thesis regarding number of souls (*jīva*) in the *cosmos*. One soul as well as whole *cosmos* have spatial extension of *asaṃkhyāta pradeśa*.<sup>16</sup> Granting that there can be many orders of provisionally finite class of *asaṃkhyāta* numbers, total number of souls would be finite (considering *asaṃkhyāta pradeśa* of soul to be minimum order of *asaṃkhyāta* and *asaṃkhyāta pradeśa* of *cosmos* to be higher order of *asaṃkhyāta*).<sup>17</sup> This way total number of souls in *cosmos* can never be infinite (*ananta*) as held by all Jain thinkers.<sup>18</sup> Even if superposition<sup>19</sup> of souls is accepted, number of *loka* (worlds) with respect of soul would also be finite in *cosmos* as no multiple of finite would lead to infinite. In other words one *loka* can not have finite souls. Hence *pradeśa* can not be regarded as a finite region of space.

From Jain cosmological texts it appears that term *asaṃkhyāta* signified infinity as only than *asaṃkhyāta pradeśa* and *asaṃkhyāta*

<sup>15</sup> *Pravacanasara* [2.50-51]. *Pancastikayasara* [1.101]

<sup>16</sup> *Sthanangasutra* [4.495]. *Dhavalā* [III, p 29, gatha 19]

<sup>17</sup> Total number of souls=(number of *pradesa* of cosmos) (number of *pradesa* of soul). Notice that souls only dwell in *cosmos*.

<sup>18</sup> *Sthananga sutra* [2.418]/ke ananta loge ? jivaccheva ajivaccheva/'what is ananta in cosmos ? soul and non-soul.' Also *Dhavalā* [III, p 29, gatha 19]

<sup>19</sup> Superposition means at one place in *cosmos* many soul can dwell at an instant superimposed on each other somewhat like waves. Jains in fact give analogy of soul and light, as in a room many lamps can light the same point so can soul exist at one point without disturbing each other. See f. n. 56.

*kālānu* would mean actual physical infinity and hence provide a consistent cosmological picture. It could be that the Jains from cosmological viewpoint had physical notion of actual infinity (concepts of infinitesimal and infinite) but from mathematical viewpoint they did not have such a notion of *asaṃkhyāta*, that is, notion of it as a transfinite number.

It appears that the above pointed confusion regarding finitude or infinitude of *asaṃkhyāta* is deep rooted even from consideration of Jain mathematics. In the Jain typology of numbers given in Table I<sup>20</sup> *asaṃkhyāta* and *ananta* are treated similarly as distinct from the class of *asaṃkhyāta* suggesting similarity of their meaning as opposed to *asaṃkhyāta*. Even relations between various kinds of *asaṃkhyāta* numbers and *ananta* numbers are similar as shown in Table I. Values of  $\alpha$  and  $\beta$  have not been indicated in the table as there is a confusion regarding these values in different texts but no confusion as far as relation between various classes of number goes. The similarity in relations of *asaṃkhyāta* and *ananta* is significant.

Moreover, even in *Dhavalā* where finitude of *asaṃkhyāta* is categorically stated, similarity of various meanings of these two classes of numbers is projected. Identical eleven-fold classification of various meanings of terms *ananta* and *asaṃkhyāta* is made in *Dhavalā*. In Table II<sup>21</sup> we have outlined this division in a way that parallel between *ananta* and *asaṃkhyāta* is apparent. Most interesting, in the context of our discussions, is that among the eleven kinds of meanings in Table II are *apradeśikānanta* and *apradeśikāsaṃkhyāta*. *Apradeśikānanta* refers to one *paramāṇu* of *puḍgala* (material indivisible monad)<sup>22</sup> and *apradeśikāsaṃkhyāta* refers to one *pradeśa* of a soul.<sup>23</sup> *Apradeśī*, an infinitesimal space less element, becomes extension of a material monad in the context of infinite (*ananta*) materiality and becomes one *pradeśa* of soul in the context of *asaṃkhyāta pradeśī* soul. A conglomerate of infinite material monad (*paramāṇu*)

<sup>20</sup> This Table is constructed from *Anuyogadvara sutra* [(a) *sutra* 497-518, and (b) p 644-684]. Classification of numbers in *Dhavalā* [III 18, 126] has also been kept in mind while constructing this Table. For example *Anuyogadvara sutra* does not regard *utkrsta anantananta* as a number but *Dhavalā* regards it as a number.

<sup>21</sup> Table II is constructed out of *Dhavalā* vol III. Numbers in square bracket indicate page number of Vol III of *Dhavalā* from where the information or quota is drawn.

<sup>22</sup> *Dhavalā* [III, p 15]/jam tam apadesiyanantam tam paramanu/'one paramanu (material monad) is called apradesikananta (infinitesimally spaceless)'.<sup>23</sup>

<sup>23</sup> *Dhavalā* [III, p 124]/jam tam apadesasamkhejjayam tam jogavibhaga paliccheda paducca ego jivapadeso/. 'in accordance with indivisible element by yoga, soul's one pradesa (region) is apradesasamkhyata (innumerably spaceless).

TABLE I  
Jain Typology of Numbers

		NUMBERS					
		Samkhyata [numerable]		Asamkhyata [innumerable]		Ananta [infinite]	
		Parita	Yukta	Parita	Yukta	Parita	Yukta
Minimum	<i>Jaghanya</i> (js) =2	<i>Jaghanya</i> (jpA) =α	<i>Jaghanya</i> (jyA) =αα	<i>Jaghanya</i> (jAA) α2α	<i>Jaghanya</i> (jya) =ββ	<i>Jaghanya</i> (jpa) =β	<i>Jaghanya</i> (jaa) =β2β
Middle	<i>Madhyama</i> (ms) 2<, <(α-1)	<i>Madhyama</i> (mpA) α<, <(αα-1)	<i>Madhyama</i> (myA) αα<, <(α2α-1)	<i>Madhyama</i> (mAA) α2α<, <(β-1)	<i>Madhyama</i> (mya) ββ<, <(β2β-1)	<i>Madhyama</i> (mpa) ββ<, <(β2β-1)	<i>Madhyama</i> (maa) β2β<, <Ω
Maximum	<i>Utkrsta</i> (us) =(α-1)	<i>Utkrsta</i> (upA) =(αα-1)	<i>Utkrsta</i> (uyA) =(α2α-1)	<i>Utkrsta</i> (uAA) =(β-1)	<i>Utkrsta</i> (uya) =(β2β-1)	<i>Utkrsta</i> (upa) =(ββ-1)	<i>Utkrsta</i> (uaa) =Ω

Though this typology and relations of various kinds of numbers is accepted by all subtraditions of Jains, there exists a discord about actual quantity and nature of numbers α and β. Also actual quantity and nature of *madhyama Asamkhyatasamkhyata* (mAA) and *madhyama Anantananta* (maa) is variedly understood. Sub-tradition represented by *Anuyogadhara sutra* does not accept that *Utkrsta anantananta* (uaa) exists.

TABLE 11

## Parallel between Ananta and Asamkhyata

<i>ANANTA</i> [11, gatha 8]	<i>ASAMKHYATA</i> [123, gatha 57]
<i>Namananta</i> (infinity as proper noun)	<i>Namasamkhyata</i> (innumerability as proper noun)
<i>Sthapanananta</i> (attributed infinity)	<i>Sthapanasamkhyata</i> (attributed innumerability)
<i>Dravyananta Agama-Noagama</i> (technical terms with respect to knowledge bearer)	<i>Dravyasamkhyata Agama-Noagama</i> (technical terms with respect to knowledge bearer)
<i>Sasvatananta</i> (ever lasting indestructible)	<i>Sasvasamkhyata</i> (ever lasting indestructible)
<i>Gananananta</i> (mathematical infinity)	<i>Ganasamkhyata</i> (mathematical innumerability)
<i>Apradesikananta</i> (infinitely small dimensionless)	<i>Apradesikasamkhyata</i> (innumerably small dimensionless)
<i>Ekananta</i> (one directional infinite extension in akasa)	<i>Ekasamkhyata</i> (one directional innumerable extension in lokakasa)
<i>Ubhayananta</i> (two directional infinite extension in akasa)	<i>Ubhasamkhyata</i> (two directional innumerable extension in lokakasa)
<i>Vistarananta</i> (two dimensional infinite extension in akasa)	<i>Vistasamkhyata</i> (two dimensional innumerable extension in lokakasa)
<i>Sarvananta</i> (three dimensional infinite extension in akasa)	<i>Sarasamkhyata</i> (three dimensional innumerable extension of lokakasa)
<i>Bhavananta</i> (Infinite knowledge bearing person on lit.) /Edesu anantesu Kena anantena payadam ? Gannanantena Padayam/[17] 'out of 11- <i>anantas</i> which is found in actuality ? In actuality <i>gananananta</i> is layed out'	<i>Bhasamkhyata</i> (innumerable knowledge bearing person on lit.) /Edesu asamkhejjesu gananasamkhejjena payadam/[125] 'out of 11- <i>asamkhyata</i> <i>gananasamkhyata</i> is layed out in actuality.
<i>Gananananta</i> has 9 subclasses [18] See Table 1	<i>Ganasamkhyata</i> has 9-subclasses [126] see Table 1.
When <i>ananta</i> is used in plural it means <i>anantananta</i> (aa) [18, 19]	When <i>asamkhyata</i> is used in plural it means <i>asamkhyatasamkhyata</i> (AA) [126, 127]
/Jamhi Jamhi anantanantayam Maggijjadi tamhi tamhi Ajahanna-anukkassa Anantanantasseva gahana/[19] 'Where aa is used ; there non-highest non-lowest or maa is meant' maa = <i>Mithyadrsti Jiva rasi</i> (number of wretched souls)	/Jamhi Jamhi asamkhejjasamkhejjayam Maggijjassena tamhi tamhi Ajahanna-ahukkassa Asamkhejjasamkhejjasseva gahana/[127] 'Where AA is used, there non-highest non-lowest mAA is meant' mAA = <i>Naraka mithyadrsti Jiva rasi</i> (number of wretched souls in hell)

constitutes an object for the senses and infinite *pradeśa* of a soul constitutes a 'cognisable by senses' entity *jīva* or soul. In this sense both, a material object as well as soul are actual infinities as far as their spatial extension is concerned and hence both *ananta* and *asamkhyāta* denote idea of actual infinity. It needs to be noted from Table II that out of eleven fold classification only one, that is, *gaṇanā*, is open to numeration and to possible meaning of mathematical actual infinity or transfinite numbers.

The similarity between *asamkhyāta* and *ananta*, as is evident from *Dhavalā*, is much more detailed and intricate.<sup>24</sup> Three more similarities, other than the one noted in Table I, are laid out in Table II. It is said in *Dhavalā* that out of elevenfold delineation of meanings of these two terms it is only *gaṇanānanta* and *gaṇanāsamkhyāta* which are to be found laid out in structure of reality. Identical nine-fold division for *gaṇanānanta* (mathematical infinity) as well as *gaṇanāsamkhyāta* (mathematical innumerability) as given in Table I is to be found in *Dhavalā* (III, p18) and *Dhavalā* (III, p126) respectively. It is also said in *Dhavalā* (III, pp18-19 and III, pp 126-127) that plural *ananta* refers to *anantānanta* and plural *asamkhyāta* refers to *asamkhyātasamkhyāta*. Further it is said in *Dhavalā* (III, p19 and p127) that *anantānanta* refers to *madhyamānantānanta* (maa) and *asamkhyātasamkhyāta* refers to *madhyamāsamkhyātasamkhyāta* (mAA). maa is a measure of number of *mithyādr̥ṣṭi jīva* and mAA is a measure of number of *mithyādr̥ṣṭi jīva* in hell.<sup>25</sup> Further similarity can be seen in the actual calculations of values of maa and mAA. These calculations as given in *Dhavalā* are displayed in Table III<sup>26</sup> in such a way that parallelism is obvious.

The parallelism between *ananta* and *asamkhyāta* is all pervasive. It is involved in classification of various shades of meanings these two terms can have, in detailed typology of mathematical meaning of these two terms, and in actual mathematical relation of identical subdivisions of these two classes of numbers. Parallelism itself can not be a convincing argument for considering *asamkhyāta* and *ananta* as transfinite numbers or mathematical actual infinity and hence also calculation of values of various *asamkhyāta* and *ananta* as theory of transfinite numbers. A more detailed investigation of actual values of  $\alpha$ ,  $\beta$  &  $\Omega$  can throw more light on the issue under consideration.

<sup>24</sup> *Dhavalā* [III, p 26]

<sup>25</sup> *Ibid.*, p 129

<sup>26</sup> This Table is constructed from *Dhavalā* [III, pp 19-26] for *ananta* and from *Dhavalā* [III, pp 127-129] for *asamkhyāta*.

TABLE III

## Calculation of mAA and maa

<i>Madhyama Asamkhyatasamkhyata</i> [mAA] =Number of wretched souls in hell	<i>Madhyama Anantananta</i> [maa] =Numbers of total wretched souls
1. Calculated from <i>Jaghanya Asamkhyatasamkhyata</i> [jAA] = $\alpha 2a$	Calculated from <i>Jaghanya Anantananta</i> [jaa] = $\beta 2\beta$
2. 3rd <i>Vargitasamvargita</i> (jAA) = [(jAA)(jAA)]**[(jAA)(jAA)]** [(jAA)(jAA)]**[(jAA)(jAA)] = x	3rd <i>Vargitasamvargita</i> (jaa) = [(jaa)(jaa)]**[(jaa)(jaa)]** [(jaa)(jaa)]**[(jaa)(jaa)] = x'
3. $x < mAA < jpa$	$x' < maa < Uaa$
4. $x + 6$ <i>dravya-s</i> = y where 6 <i>dravya-s</i> are	$x' + 6$ <i>ananta rasi-s</i> = y' where 6 <i>rasi-s</i> are
(1) <i>Pradesa</i> of <i>Dharmadravya</i>	(1) <i>Number</i> of <i>Siddas</i> are
(2) <i>Pradesa</i> of <i>Adharmadravya</i>	(2) <i>Number</i> of <i>Sadharana Vanaspati-nigoda</i>
(3) <i>Pradesa</i> of one Soul	(3) <i>Number</i> of <i>Vanaspati</i> souls
(4) <i>Pradesa</i> of <i>lokakasa</i>	(4) <i>Elements</i> of <i>Pudgala</i>
(5) <i>Pradesa</i> of <i>pratisthit</i> every vegetable	(5) <i>Instant</i> in <i>Vyavaharakala</i>
(6) <i>Pradesa</i> of <i>pratisthit</i> every vegetable	(6) <i>Pradesa</i> of <i>Alokakasa</i>
5. 3rd <i>Vargitasamvargita</i> of y = Z	3rd <i>Vargitasamvargita</i> of y' = Z'
6. 3rd <i>Vargitasamvargita</i> of Z + 4 <i>aggregates</i> = W where 4 <i>aggregates</i> are :	3rd <i>Vargitasamvargita</i> of Z' + 2 <i>rasi-s</i> = W' where two <i>rasi-s</i> are :
(i) <i>Instants</i> of <i>Kalpa</i>	(i) <i>Non divisible Pariccheda</i> of <i>Dharma</i>
(ii) <i>Spatial units</i> of <i>cosmos</i>	(ii) <i>Non divisible Pariccheda</i> of <i>Adharma</i>
(iii) <i>Anubhagobandha-adhysvdsya-Sthava</i>	
(iv) <i>Auibhogo praticcheda</i> of <i>Yoga</i>	
7. $jpa = W = \beta$	$Uaa = 3rd$ <i>Vargitasamvargita</i> of $W = SL$
8. $\alpha 2a < mAA < \beta$	$\beta 2\beta < maa < \Omega = uaa$

From Table I and Table III values of  $\beta$  and  $\Omega$  and hence all other values can be derived out of  $\alpha$  and some *asaṃkhyāta dravya-s* and *ananta rāsi-s*. Value of  $\alpha$  is not evident from these Tables and it is on this value that issue of finitude or infinitude hinges.<sup>27</sup> Is  $\alpha$  a transfinite number? If it is transfinite then all *asaṃkhyāta* and *ananta* numbers are transfinites and Jains have a theory of transfinite members. If, on the other hand,  $\alpha$  is finite than from jpA till jAA are certainly finite. If innumerable space points of 6 *dravyas* and innumerable quantity of 4 aggregates is considered finite than even  $\beta$  would be finite. Hence jpA to jaa would be finite. This had been noticed by a veteran scholar A. N. Singh.<sup>28</sup> As *Dhavalā* categorically states that *ananta* is a transfinite number it would mean that maa and uaa are the only transfinites as 6 physical *ananta* quantities are added to obtain them.

We notice here that for obtaining various classes and subclasses of numbers two kinds of quantities are used by Jains, (1) Mathematical quantities as jAA= $\alpha^{2x}$ , where  $\alpha$ =jpA etc., and (2) physical quantities, such as 6 *dravya-s*, 6 *rāsi-s* etc. From cosmological arguments outlined earlier we know for certain that physical quantities are actual infinities and hence their number has to be a transfinite number. We do not see any reason to accept A. N. Singh's argument that *ananta pradeśa* of *puḍgala* or *ananta pradeśa* of *alokākāśa* are transfinite numbers but *asaṃkhyāta pradeśa* of *lokākāśa* or *asaṃkhyāta pradeśa* of a soul are not transfinites. This has been argued purely from a cosmological viewpoint. By accepting this cosmological viewpoint of physical actual infinities in mAA, jpA ( $=\beta$ ) and higher up in the hierarchy of numbers become transfinite. From cosmology argument again, it can be said that even *jaḡhanyayuktāsaṃkhyāta* (juA) is also a transfinite number as it is equated by Jain theoreticians with *āvali* (minimum numerable unit of time).<sup>29</sup> One *āvali* is a physical actual infinity constituted out of *asaṃkhyāta* infinitesimal instants of time or *kālāṇu*<sup>30</sup> and in this sense number of *āvali* has to be a transfinite number. Hence juA= $\alpha$   $\alpha$  is a transfinite

<sup>27</sup> A complicated determination procedure for value of  $\alpha$  is given in *Anuyogadvara sutra* [sutra 508 or pp 650-664]. A different procedure can be found in *Trilokasara* of Nemicandra. Value of  $\alpha$  in *Anuyogadvara sutra* is given by using method of simili and it leaves indeterminate whether  $\alpha$  is finite or infinite. Nemicandra is clear on finitude of  $\alpha$ .

<sup>28</sup> A. N. Singh (1942).

<sup>29</sup> *Anuyogadvara sutra* [sutra 511 or p 662]/*avaliyavi tattiya ceva/āvali* (unit of time) is that (*jaḡhanyayuktasamkhyata*).

<sup>30</sup> *Anuyogadvara sutra* [sutra 367 or p 247]/*asamkhijanam samayanam samudayasa mitisamagamenam sa ega avali attivuccai/one avali is formed out of collection of innumerable time instants*.



number implying that even  $\alpha$  is a transfinite number. This would be a conclusion if *asaṃkhyāta* is regarded as an actual infinity in a physical sense and if such a physical actual infinity is used in number calculations it would be a transfinite number.

A much stronger reason to regard *asaṃkhyāta* as mathematical actual infinity or a transfinite number is in the nature of mathematical operation which Jains developed to handle various categories of numbers. One such example is the following set of formulas given in *Dhavalā*.<sup>1</sup>

- (1)  $J^2/(J+J/n)=J-J/(n+1)$   
where  $J$ =total number of souls, and  
 $n$ =countable (*saṃkhyāta*) number
- (2)  $J^2/(J+J/us)=J-J/jpA$   
 $us$  and  $jpA$  from Table I
- (3)  $J^2/(J+J/asaṃkhyāta)=J-J/(asaṃkhyāta)$
- (4)  $J^2/(J+J/uAA)=J-J/jpa$   
 $uAA$  and  $jpa$  from Table I
- (5)  $J^2/(J+J/ananta)=J-J/ananta$

Last four relation have obviously been constituted by analogy with relation (1) which is valid for all natural numbers. Besides, some more operations on various kinds of *asaṃkhyāta* and *ananta* have been assumed. These corresponding to the five formulas are :

- (1)  $n \neq n+1$  if  $n$  is finite
- (2)  $jpA=us+1$
- (3)  $asaṃkhyāta=asaṃkhyāta+1$ , where *asaṃkhyāta* is neither minimum nor maximum *asaṃkhyāta* number
- (4)  $jpa=uAA+1$
- (5)  $ananta=ananta+1$ , where *ananta* stands for neither minimum nor maximum *ananta* number

<sup>1</sup> *Dhavalā* [III, pp. 45-46] gives these five formulas.

From the above five relations it is clear that property of induction is generally valid for *saṃkhyāta* numbers but is invalid for middle *asaṃkhyāta* and middle *ananta* numbers. This is significant as such relations will hold only if middle *asaṃkhyāta* and *ananta* are regarded as transfinite numbers. Property of induction seems to hold for us and uAA numbers but this is not a case as us and uAA are each a class of only one number hence relation (2) and (4) are extraordinary. A. N. Singh<sup>32</sup> had regarded relation (2) and (4) as a fallacy in Jain theory of transfinite numbers, if there existed one such theory. It needs to be noted that this so called anomaly is because of particular relation that Jains posited between jpA and us and between jpa and uAA. *Anuyogadvāra sūtra*<sup>33</sup> explicating meaning and value of jpA gives an analogy of a platform which when being filled by hog-plums (*añvala*) reaches a point when a hog-plum is left which can not be contained in that platform. In a sense nth hog-plum spills out of a bounded set. Number jpA is analogous to this nth hog-plum which spills out of a bounded set of *asaṃkhyāta* numbers or a platform. And the number of hog-plums which can be contained in the platform are (n-1) or highest *saṃkhyāta* is (jpA-1) = us. Thus jpA = us + 1 and jpa = uAA + 1 have a special semantic significance other than the mathematical property of induction and hence there is no real anomaly. It is quite significant that the property of induction does not hold for all kinds of *asaṃkhyāta* and *ananta* numbers suggesting strongly that these classes of numbers are transfinite numbers radically distinct from *saṃkhyāta* (finite) numbers where property of mathematical induction holds good.

Even if induction does not hold for *asaṃkhyāta* and *ananta* numbers Jains evolved mathematical theory of operations which holds good for all the three primary categories of numbers. These were :

<sup>32</sup> A. N. Singh (1942). He regarded relation (2) & (4), as anomalous in the context of number relation given in Table I and not in the context layed in these five formulas.

<sup>33</sup> *Anuyogadvāra sūtra* [sūtra 508 or p 648]/se jahanamae mance siya amalaganam bharie, tattha ege amalae pakkhitta seavi mae, anneavi pakkhitte seavi mae, anneavi pakkhitte seavi mae. evam pakkhippamanenam pakkhippamanenam ho hi seavi amalae jamsi pakkhitte se mamcae bharijihii je tath amalae na mahii/ '(suppose) there is a platform filled with log-plum fruits when one hog-plum fruit is placed, that also is accommodated. Yet another is placed, that also is accommodated ; when (hog-plums) are thus placed again and again, there will be a (last) hog-plum which being placed, the platform will be (completely) filled (and there will be another hog-plum which will not find any place there). Number of a hog-plum which can not be accommodated will be (α).

(a) *Derived out of multiplication :*

- (1) *Varga*—square—*Varga*  $(x)=x^2$   
*Uttarottara Varga*—higher squares—*Uttarottara Varga*  
 $(x)=x^n$  where  $n$  is *samkhyāta*
- (2) *Prathama vargamūla*<sup>34</sup>—square root—1st *vargamūla*  $(x)=\sqrt{x}$   
*Dvitiya vargamūla*—4th root—2nd *vargamūla*  $(x)=\sqrt[4]{x}$   
*Tṛtīya vargamūla*—8th root—3rd *vargamūla*  $(x)=\sqrt[8]{x}$
- (3) *Ghana*<sup>35</sup>—cube—*Ghana*  $(x)=x^3$   
*Ghānaghana*—cube of cube—*Ghānāghana*  $(x)=x^9$
- (4) *Vargitasamvargita*<sup>36</sup>—quantity raised to the power of itself  
1st *Vargitasamvargita*  $(x)=x^x=y$   
2nd *Vargitasamvargita*  $(x)=y^y=z$   
3rd *Vargitasamvargita*  $(x)=z^z$

(b) *Derived out of division :*

- (1) *Ardhaccheda*<sup>37</sup>—number of times a quantity can be halved  
*Ardhaccheda*  $(x)=\log_2 x$
- (2) *Trikaccheda*<sup>38</sup>—number of times a quantity can be divided by 3  
*Trikaccheda*  $(x)=\log_3 x$
- (3) *Caturthiaccheda*<sup>39</sup>—number of times a quantity can be divided by 4  
*Caturthaccheda*  $(x)=\log_4 x$

(c) *Derived out of addition :*

Only addition of physical actual infinites are permitted, like the addition operation when calculating  $\beta$  and  $\Omega$ <sup>40</sup>  
(see Table III)

<sup>34</sup> *Dhavalā* [III, pp 74-75]

<sup>35</sup> *Dhavalā* [III, pp 60-61]. For example *Ghana*(16)=4096 and *Ghānaghana*  $x=x^9$  and *Prathama Vargamūla* of *Ghānaghana* (16)=262144.

<sup>36</sup> *Ibid.*, p 20

<sup>37</sup> *Ibid.*, p 21

<sup>38</sup> *Ibid.*, p 56

<sup>39</sup> *Ibid.*, p 56

<sup>40</sup> *Ibid.*, p 21

(d) *Derived out of subtraction :*

Only two singular quantities  $us$  and  $uAA$  are derived by subtracting—one from  $jpA$  and  $jpA$  respectively. This case has been dealt above.

First two classes of operations seem to be justified from the viewpoint of transfinite number theory. But the last two classes of operations are quite different as they deal purely with operation on physical actual infinities whose quantity are not indicated in terms of any ordinals ( $\alpha, \beta$  etc.). A unified picture of Jain concern with transfinite numbers and physical actual infinities can only be constructed if unified view of Jain physical and mathematical concern is taken. This unified view is possible on the basis of principal concern of the Jains ordering actual infinities. Motivation behind drive for ordering actual infinities stems for a unique Jain theory of measurement which forms a subject-matter of the next section.

It has been demonstrated in this section that *asamkhyāta* and *ananta* were used in the sense of transfinite numbers in Jain literature though there existed an apparent confusion regarding transfinity of *asamkhyāta*. But why did Jains expound two categories of transfinite numbers, viz., *asamkhyāta* and *ananta* ? Why was not one category with different internal orders adopted by Jain theoreticians ? The reason for this lies in the Jain theory of measurement which in fact provided a basic thrust for Jain concern about transfinite numbers and actual infinities and their mutual ordering. Besides reason for confusion regarding *asamkhyāta* can also be illuminated from the investigation of theory of measurement.

[To be concluded]

# Omniscient Beings

HARISATYA BHATTACHARYYA

To have an idea of the omniscient beings, as the Jainas understand them, a study of the nature of omniscience and omniscient beings, as conceived in the Indian non-Jaina systems of philosophy may serve as an illuminating preliminary.

## *The Liberated State and Omniscience : The Buddhist View*

Save and except the Mimamsa, the Vedic systems of philosophy mostly admit that there is a God, on whose will and intelligent efforts depend the creation, the preservation and the annihilation of the world and in whatever manner he may be called—the Pradhana, the Isvara, the Saguna-Brahma as the Purana Purusa—, God is omniscient. The Jaina's do not admit the existence of an architect God and so the question of divine omniscience does not arise with them. So far as the doctrine of God's omniscience is concerned, the Buddhist position is similar to that of the Jaina's. The Buddhists also do not believe in the existence of God. Therefore, the problem boils itself down to this : Either the finite beings are capable of attaining omniscience or omniscience is an impossibility. Now, with regard to the problem of omniscience in finite beings, the Buddhist attitude may be indicated in the following manner.

That the mundane unliberated souls are not omniscient is admitted not only by the Mimamsaka's but by all the philosophers. The fact is a matter of observation and not denied by the Buddhist. The liberated souls are, in the language of the Buddhist, *nirvāṇatā-gata* i.e. in the state of *nirvāṇa*. Scholars have differed regarding the meaning of *nirvāṇa* but with respect to omniscience in the liberated the difference is of no effect. For, if '*nirvāṇa*' means extinction like that of the light of an extinguished lamp, then a *jīva* is no more alive when it enters the *nirvāṇa* so that it is quite meaningless to talk of it then as omniscient. If on the other hand, *nirvāṇa* means a state (*śaraṇam*, *parāyaṇam* or *akṣaram*) which is everlasting (*anantam*, *acyūtam*, *asaṃkhyatam*, or *anuttaram*) and which has been described in the sacred books of the Buddhists as blessed and true (*khīmam*, *śivam*, *saccam*, *kevalam*, *padam*) then a being in *nirvāṇa* may not be devoid of existence ; but with regard to a being in

such a state also, the question of omniscience does not arise. For, according to the Buddhists, *tanhā* is at the root of all knowledge ; owing to *tanhā* and the *vāsanā*, momentary apprehensions regarding momentary objects arise every moment. This series of momentary apprehensions (*santāna*) stops absolutely when *nirvāṇa* is attained at the annihilation of *vāsanā*,—so that it is not possible for a *jīva* who has attained the *nirvāṇa* to have omniscience or knowledge of all or any of the objects of the world.

*The Liberated State and Omniscience: The Nyāya and the Vaiśeṣika Views*

Just as omniscience is impossible in a being who has entered the state, called the *nirvāṇa* by the Buddhist, it is impossible in a similar way in a soul which has attained absolute liberation, called *apavarga* by the Naiyayikas. According to Gautama, desire, aversion, effort, pleasure, pain and knowledge are the attributes or peculiar characteristics of a soul ; some add three other attributes to this list. In any case, the theory of the Nyaya philosophy is that when *apavarga* or final emancipation is attained, all those attributes or characteristics of the soul leave it absolutely.

*tadīvam dhiṣanādīnāṃ navānāmapi mūlatah  
guṇāmātmano dhaṃśah sohpavargah pratiṣṭhitah*

In a *jīva* which has attained *apavarga*, *jñāna* or consciousness is absurd just like its other attributes,—so that when one thinks that the state of liberation, as conceived by Gautama, is not unlike the absolutely passive and unconscious state of a stone.

*muktaye yah śilātvāya ṣaṣṭramūce sacitasam  
—Naiṣadhīya-Caritam, 17/75*

he is not probably wrong.

According to the Vaisesikas also, the soul is in the state of liberation, when on the annihilation of all its attributes e.g. consciousness etc ; it exists like the expanse of sky.

*atyanta-nāśē guṇa-saṃgateryā  
sthītirnabhovāt kaṇabhakṣa-pakṣe muktih...*

—*Samkṣepa-Samkara-Vijayah, 16/69*

A liberated soul is thus unconscious ; so that it must be understood to be the theory of the Nyaya and the Vaisesika systems that a liberated soul cannot be omniscient. Although some of the Naiyayikas hold that there is a feeling of eternal happiness (*nitya-sukha*) in a soul in its liberated state, it is the common contention of all the Naiyayikas that the liberated soul has no consciousness of the world and its objects. Consequently, the emancipated being is not omniscient.

*The Liberated State and Omniscience : The Advaita Vedānta View*

According to the Vedantins of the Advaita (absolute monist) school, neither the bondage nor the emancipation of the soul is real. If from the *vyavahāra* or empirical standpoint a soul be said to be freed from its state of bondage—even then, omniscience cannot be attributed to the emancipated being. For, a liberated soul is nothing but a soul ‘in itself’ ; in such a soul, which is absolutely non-dual consciousness there can be no ‘internal division’ (*svagatabheda*). And because there is nothing outside it which is similar to or dissimilar from it, there cannot be distinction of it ‘from its similars’ (*sajātīya bheda*) or from its dissimilars (*vi-jātīya-bheda*). A liberated soul is not a knower but consciousness itself ; there is nothing beside it.

*neha nānyāsti kiñcana*

Owing to *avidyā* or false knowledge, of course, there may be consciousness of outside objects in a soul in bondage.

*yatra hi dvaitamiva bhavati taditara itaram paśyati*

But in its state of liberation, there is nothing outside or beside it so that a liberated soul has no consciousness of objects other than itself.

*yatra tasya sarvamātmaivabhūt, tat kena kam paśyati*

Accordingly, from the standpoint of the Advaita Vedanta omniscience in a liberated being is impossible.

*The Liberated State and Omniscience : The Sāṅkhya and the Yoga Views*

The philosophers of the Sankhya and the Yoga schools maintain that the evolution of the world is due to the conjunction of the *prakṛti* and the *puruṣa*. The soul may be said to be in a state of bondage as

long as the *prakṛti* remains proximate to it. The soul, however, is absolutely incompatible ; there cannot be any real connection of the *prakṛti* with it. It is owing to *aviveka* or ignorance that the essentially incorruptible *puruṣa* is looked upon as affected or influenced by the *prakṛti*.

*nihsangehpyuparagoh vivekāt*

—*Sāṅkhya sūtram : Tantrārtha-Saṃkṣepadhyāya, 28*

When a red flower is held over a glass-ware, the shade of redness falls upon the latter and makes it appear as red ; but the real nature of the glass-ware is not modified in the least thereby. In the same manner, the proximate-ness of the *prakṛti* to the *puruṣa* makes no change in the essential nature of the latter.

*javā-sphaṭikayoriva noparāgah kintvabhimānah*

—*Ibid., 29*

It is thus that owing to *aviveka*, the soul is considered to be in bondage when the *prakṛti* is near it and that it is said to be emancipated when the *prakṛti* is no longer near it. Really, there is no relation whatsoever between the *puruṣa* on the one hand and the *prakṛti* with its evolutes on the other. When a soul is liberated, it is even impossible to imagine a connection. The liberated *puruṣa* can not thus be said to be omniscient or a knower of all things, according to the principles of the Sankhya and the Yoga systems.

It is consequently clear that the Buddhist and the Vedic systems agree that not only are the mundane souls not omniscient but that the liberated and the finally disembodied souls also are not such.

#### *The Stage Penultimate to Liberation and Omniscience : The Yoga View*

Although neither a mundane Soul nor an emancipated being is omniscient, a soul *on the way to liberation* may be possessed of a kind of knowledge, just before its final emancipation, which may be called omniscience. The author of the *Yoga-Sūtras* calls it *prātibha* and the Sankhya also believes in its possibility. According to Patanjali, one possessed of the *prātibha* has the knowledge of all things.

*prātibhādvā sarvam*

—*Yoga-Sūtram, Bibhūti-pādah, 34*



Upon which Bhojaraja comments,—

*yathodeṣyati savitari pūrvam prabhā  
prādurbhavati tadvadivekakhyāteh  
pūrvam tārakam sarva-viṣayam  
jnānamābirbhavati*

Just as immediately before the sun-rise a brilliant glow is visible in the sky, in the same manner just before the rise of *viveka-khyāti* or consciousness of emancipation, there arises the knowledge called *tāraka* through (to) this *tāraka* knowledge, all things are known.

This *tāraka* is otherwise called the *prātibha*.

*The Stage Penultimate to Liberation and Omniscience : The Sāṅkhya View*

The Sankhya school of philosophers attribute to the yogis or sages, a supernatural mode of perception, in which all things and phenomena of all places and of all times are cognised and they account for it in this way. The yogis or seers, through their penances and self-perfection attain a power by which they come in direct contact with the Pradhana, the potential basis of all things ; as all things evolve from the Pradhana and on their dissolution enter into it, the Pradhana is the real substance in which all phenomena live, move and have their being. By 'seeing' the Pradhana, one sees all things evolving out of it. It is thus that the yogi's being in contact with the universal basis of all things through their supernatural attainment are enabled to perceive all things.

*līna-vastu-labdhātīśaya-sambandhāt*

—*Sāṅkhya-Sūtram, Viṣayādhyāya, 89*

The commentator explains,

*sat-kārya-sthiter naṣṭamapi sva-kāraṇe tīnam bhūtatvenāsti. bhavi-  
ṣyadapi sva-kāraṇehnāgatatvenāsti-yogajadharmānugrahallabdhātīśa-  
yasya yogina eva pradhāna-sambandhāt sarva-diśakālādi-sambandha iti*

The effect is existent in the cause. What is found to perish exists in a potential state in its basal ground. What is future exists in its cause as something not come as yet. On account of their attainment of supernatural power of vision, the yogis come in contact with the Pradhana and through this contact, they come in contact with (things of) all places and all times.

This supernatural power of vision in the yogis is practically omniscience. Thus although the Sankhya philosophers do not believe divine omniscience nor in the omniscience of a liberated being, they admit the possibility of omniscience in the yogis or persons on the high way to self-culture.

*The Stage Penultimate to Liberation and Omniscience : The Nyāya and the Vaiśeṣika Views*

The thinkers of the Nyaya school maintain that it is impossible for the instrument (*karana*) of knowledge to be simultaneously connected with more than one percept ; for this reason, a simultaneous cognition of all things is impossible according to them. But they admit that the recollections of all things or cause of the cognitions of all things, may simultaneously present themselves to a sage, when he may be possessed of a knowledge which relates to the whole collection of the objects. Such a knowledge has been called by them *samūhālabhana* or collective knowledge. This *samūhālabhana* is practically identical with the 'pratibha' knowledge noticed before and consists in a sort of omniscience.

The Vaisesika thinkers have given the name *ārṣa-jñāna* or 'the knowledge of a seer' to the *prātibha* which relates to the knowledge of all things.

*The Stage Penultimate to Liberation and Omniscience : The Advaita Vedānta View*

Omniscience is impossible in both a liberated and an unliberated soul, according to the absolute monist school of the Vedānta philosophy. But it is possible in a highly developed sage. It is said that a Naiyayika in order to test the profoundness of Sankara's knowledge, once asked him to explain the difference between the conceptions of liberation, of the Nyaya and the Vaisesika schools. The questioning Naiyayika was a very concredited person and so addressed Sankara as follows :

*vada sarvaviccet no cet pratijñām tyaja sarvavittve*

—*Samkṣepa-Samkara-Vijayah*

If you are Omniscient, answer the question ; if not, give up your contention about omniscience.

From the above, it is apparent that according to the thinkers of the Advaita school, omniscience is not impossible. Sankara has said that to the nature of a liberated soul or Brahman, omniscience, omnipotence etc. (*sarvajñatvam, sarveṣvaratvanca*) are not to be attributed

*na caitanyavat svarūpatva-sambhavaḥ*

—*Vedānta-Sūtra-Bhāṣya*, 4-4-6

But he admits that supernaturalities like omniscience etc are possible in a determined (*saguṇa*) soul, in a certain stage of its development.

*vidyamānamevedam saguṇāvasthāyāmaisvaram  
bhūma-vidyā-stutaye samkīrtate*

—*Vedānta-Sūtra-Bhāṣya*, 4-4-11

In other words, Sankara's opinion is that by worshipping the Saguna-Brahma, the worshipper while attaining his likeness etc. (*sāyujya*), becomes possessed of such supernaturalities as Omniscience etc.

*saguṇa-vidyā-vipāka-sthānantvetat*

—*Vedānta-Sūtra-Bhāṣya*, 4-4-16

*The Stage Penultimate to Liberation and Omniscience : The Buddhist View*

*sarvajñah sugato buddhah dharma-rāja-stathāgataḥ*

The word *sarvajña* in the above list of Buddha's names shows that although omniscience, according to him, is impossible in a mundane being or in a being who has entered the *nirvāṇa*, it is possible in a person in a certain stage of mental development. Neither sensuous knowledge nor inference can yield omniscience ; for, not only is the range of such forms of knowledge limited but they are after all vague and indistinct. Without a full and clear knowledge of objects the knower cannot be said to have attained omniscience. This perfect and the clearest possible knowledge about all the things of the universe has been called the *spḥutābha* knowledge by the Buddhist thinkers. According to them, the *spḥutābha* is due to a direct perception which is peculiar to sages (*yogi-pratyakṣa*). The ordinary knowledge about objects which we get through the *pramāṇas* or empiric sources of knowledge is *bhūtārtha* and to contemplate the *bhūtārtha* again and again is *bhūtārtha-bhāvanā*. As a result of the *bhūtārtha-bhāvanā*, the knowledge of its object comes

to be clearer and clearer. The *bhūtārtha-bhāvanā* has various stages—the *bhūtārtha-bhāvanā-prakarṣa*, but these not yield the full and the perfect knowledge about things,—until the last stage,—*bhāvanā-prakarṣa-paryanta* is reached. From the *bhāvanā-prakarṣa-paryanta* is evolved a direct apprehension about objects in the mind of the sage, which is called the *yogi-pratyakṣa*—‘the perception of a sage’.

*bhūtārtha-bhāvanā-prakarṣa-paryantajam yogi-jñānam ceti*

—*Nyāya-Vindu*, 1

The three forms of perception viz ; sense-perception (*indriya-jñāna*), internal perception (*mānasa-pratyakṣa*), and self-perception (*sva-saṃvedana*) cannot yield omniscience ; neither can inference (*anumāna*) yield it. For, all these modes of cognition are imperfect and indistinct. The fourth mode of perception, according to the Buddhists, is the *yogi-pratyakṣa* ; which we have just noticed. The *yogi-pratyakṣa* yields omniscience. It should be noticed, however, that even the perceptual stage, penultimate to the *yogi-pratyakṣa*—the *bhūtārtha-bhāvanā-prakarṣa-paryanta*,—does not give perfect and the clearest possible knowledge about objects. It is said that the knowledge obtained at this is like the knowledge of a thing, seen through a thin, transparent substance.

*abhraka-vyavahitamiva yadā bhāvvyamānam vastu paśyati sāv prakarṣa-paryantāvasthā—Nyāya-Vindu-Tīkā*

The object when seen in *yogi pratyakṣa* is like a small fruit in one’s hand perceived in the perfect and the clearest possible manner.

*karatalāmalakavadbhāvvyamānasyārthasya yaddarśanam tadyoginah pratyakṣam, taddhi sphuṭābham—Nyāya-Vindu-Tīkā*

As a result of this uncommon perception, peculiar to a sage, the objects of the universe were apprehended by Buddha and saints like him, ‘like the *āmalaka*-fruit in hand’ and they succeeded in attaining omniscience.

*The Liberated State and Omniscience : The Non-Advaita Vedānta Views*

It has been pointed out more than once that the liberated soul and the soul which has entered the *nirvāṇa*, are not omniscient although, omniscience may be possible in a being who is about to attain final emancipation. This is the theory, upon which the Sankhya, the Yoga,

the Nyaya, the Vaisesika, the Buddhist and the Advaita monists of the Vedanta school are agreed. But those philosophers of the Vedanta school who do not admit the identity of the Brahman and the *jīva*, hold a different view. According to them, the liberated *jīva* becomes omniscient, and the grounds for this view of the dualistic Vedantists are obvious. They do not admit the reality of the absolute and the undetermined (Nirguna) Brahman. The Brahman, according to them, is 'Saguna' i.e., determined and endowed with attributes. The absolute monists of the Vedanta school maintain that it is impossible to ascribe omniscience or any qualification to the liberated soul which is merged in the attribute-less Brahman. Even these monists do not deny that a soul which is by dint of its self-culture and self-development has succeeded in closely associating itself with the qualified or the Saguna Brahma attains omniscience. The Vedantins, other than the absolute monists hold that Brahman is 'Saguna' or qualified and that the absolute, unqualified, or the Nirguna Brahma is an unreal abstraction, that the *mukti* or emancipation of a soul consists in its inseparable association with (and not an absolute merger in) the Saguna Brahma and that such a liberated soul comes to be possessed of the qualities of the Lord, including omniscience.

It seems to us, however, that the omniscience thus attributed to the liberated soul by the dualistic schools of the Vedanta, is not of the same nature or extent with the omniscience, attributed to the Isvara by the Nyaya, the Vaisesika, the theistic Sankhya, the Yoga and the Vedanta. The omniscience of the latter is eternal, unfettered and all-embracing. It is, however, the very nature of the *jīva* to have but a limited range of apprehension and this limited capacity of the *jīva* is not radically changed, even when it attains liberation. Accordingly, it would probably not be correct to say that all the cosmic things and phenomena of all times and places, beginningless and endless are ever present in the omniscience of the liberated *jīva*, as now and 'here', simultaneously. Even when a soul associates itself with the Lord in its emancipated state, its powers are still limited, in comparison with the powers of the latter. A liberated soul, for instance, has no power to interfere in or modify the *jagat-vyāpāra*—i.e., the creation of the world,—which is the sole prerogative of the Isvara. It is true that a liberated soul comes to be possessed of many supernatural powers ; it can go anywhere it likes,

*sarveṣu lokeṣu kāma-cāro bhavati*

—*Chāndogya-Upaniṣat*, 7.25. 2.

but from the word 'kāma', it is manifest that this power of unrestricted movement is dependent upon his 'desire'. Similarly, it is not true that all the things and the phenomena of the world, past, present, future, subtle, near, distant etc. are simultaneously and actually and always present in the consciousness of the emancipated *jīva*. Its supernatural attainment consists in the fact that unlike a soul in bondage, it can know them, *whenever it likes*. Let us explain the position by an example. It is not a fact that his ancestors are always present before a liberated being or in his mind. Whenever he wants to see them, they appear before him at once.

*sa yadā pitṛ-lōka-kāmo bhavati, samkalpādevāsyā pitarah samu-  
tiṣṭhanti*

—Chandogya-Upanisat., 8.2 1.

The omniscience of a liberated soul thus consists in the fact that it has the power to know at once, whatever it wants to know and not that all the cosmic things and phenomena are ever present in its consciousness. The omniscience of the Lord, however, is not of this sort. His omniscience is eternal ; in it are ever present all the objects and occurrences of all times and places. The liberated soul has not this kind of omniscience, this is the view of the Vedantists of the Dvaita or dualistic, the Dvaitadvaita or dualistico-monist and the Visistadvaita or differentiated monistic schools. The Advaita or the absolutely monistic schools of the Vedanta also attribute such an omniscience to the highly developed worshippers of the Saguna Brahma and we believe, such an omniscience, and nothing more than that, has been said to be attainable in the *samūhālabhana* of the Nyaya, the *ārṣa-jñāna* of the Vaisesika, the *prātibha* of the Sankhya and the Yoga and the *yogi-pratyakṣa* of the Buddhist.

### *The Liberated State and Omniscience : The Jaina View*

That the unliberated *jīva*'s wandering in the *samsāra* are not omniscient is a matter of common experience and has been admitted in the Jaina philosophy, just in all other systems. There is a remarkable unanimity between the Jaina's who repudiate the authority of the Veda's and the Mimamsaka's who are firm supporters of the Vedic orthodoxy and ritualism, regarding the doctrines that the *jīvas* have been wandering from the beginningless time in the *samsāra*, driven by the forces of their *karmas* and that there is no Creator of this universe. But although the Jainas agree with the Mimamsakas in admitting the inexorableness

of the law of *karma* and repudiating the creatorship or the Governorship of *Isvara*, they do not like to be looked upon as atheists like the latter. In the theistic schools of the Vedic philosophy, besides the creation of the world, another function is ascribed to God. The Vedas are the source of *dharma*, i.e., the knowledge of duty and God is said to be the author or the revealer of the Vedas. Accordingly, God is the Seer of the *dharma* and the first Teacher. While proving the omniscience and the omnipotence of Brahman (*sarvajñatvam sarva-śaktivānceti*), Sankara quotes from the *Sruti* :

*asya mahato bhūtasya-niḥśvasitametad. yadṛgvēdah* and says that the Vedas and the scriptures have, like breath, emerged from the Great Being, the *Isvara* or the Brahman. In describing the infallibility of the Vedas, the author of the *Nyāya-Sūtras* says—

*tat-prāmāṇyamāpta-prāmāṇyāt—Nyāya-Sūtram, 2-1-68*

The infallibility of the Vedas is due to the infallibility of the *āpta*.

Here the word '*āpta*' refers to the Veda-reciter (*veda-vaktā*) ; *Isvara*, who is '*Sākṣātkṛtadharmā*' i.e. the direct knower of the *dharma* and a faithful Teacher of what he knows—

*'yathā-drṣṭasyārthasya cekhyāpāyīṣayā prayukta upadeṣṭā'*

Kanada also has referred to the teachership of God in the very same manner—

*tadvacanādāmnāyasya—Vaiśeṣika-Sūtram, 1-1-3*

*Amnāya* or the Vedas are words of God. Their infallibility arises from the infallibility of God.

With reference to the teachership of God, the author of the *Yoga-Sūtras* has said—

*sa pūrveṣāmapī guruh kālenāvvyavacchedāt*

—*Yoga-Sūtram : Samādhi-pādah, 26*

That beginningless Being is the teacher, even of the early teachers, (e. g. *Brahma*).

Although the Jainas do not admit an *Isvara*, who is the world-creator, they do admit a perfect human Being who is the best of teachers.

This perfect Being is called the 'Tirthankara' and the Jainas call him 'Isvara' i.e. God. The teachings of the Tirthankara are not of course the Rk, the Yajus, the Sama or Atharva (which are repudiated by the Jainas) but are certainly the best authorities on matters, philosophical, ethical and religious. The Jainas call the teachings of the Tirthankara God, the Jaina Veda and according to them, it is the Jaina Veda which alone embodies the true teachings of the true God and as such, is the real, infallible Veda. In this way, the Jainas show that they are not opposed to the doctrine of the Veda-receiver Omniscient God. With all this, however, it is obvious that there is essential difference between the Isvara of the Jainas and the Isvara of Vedic school. The God of the Jainas is not the creator of the world, he was originally a mortal human being, who through self-culture and self-development attained Godhood, consisting in teachership. The Tirthankara Gods are also more than one in number. The God of the Vedic school, on the contrary, is the world-creator and from "eternity to eternity" is the one ever-free Lord, revealing the Vedas in the early dawn of the cosmic creation.

The Tirthankara, otherwise called the 'Arhat' is then the Isvara according to the Jainas, who is the author of the Vedas (of course the Jaina scriptures). By admitting in this way the doctrine of the authorship and of the teachership of the Vedas, the Jainas distinguished their view from that of the Mimamsakas, according to which, the Vedas are uncreated and self-existent. Regarding the question of the 'mukti' or final emancipation also, the Jaina and the Mimamsa views are different. According to the Mimamsakas, a good, well-behaved and dutiful man on his death goes to heavens and enjoys the best happiness, 'mukti' or complete liberation, however, is unattainable. According to the Mimamsaka thinker the *samsāra* or the existential series is not only beginningless but endless also, the Jainas, on the contrary maintain that save and except the '*abhavya*' *jīvas* (who can never attain the complete emancipation), all souls are capable of attaining liberation. A soul, when liberated, is possessed of *kevala-jñāna*, which is nothing other than omniscience.

Besides the disembodied perfect Beings who are completely free and are omniscient, according to the Jainas, as stated above, a highly developed Being, while in body, may attain omniscience also. The Tirthankaras were such Beings who attained omniscience, while they lived, moved and had their being still in this world. This Jaina doctrine of omniscience in a Being who is not yet disembodied, is obviously akin to the theories of the other Indian schools, according to which omniscience is possible before final liberation.



A liberated soul is omniscient according to the Jainas. On this point and, it seems to us, on the question of the nature of omniscience in souls which have attained it, the Jainas differ from the other Indian schools. In most of the philosophical systems of India, other than the Jaina, omniscience has not been attributed to a liberated soul. It is sure that in the Vedantic systems except that of the Advaita school, omniscience has been attributed in a liberated soul. But as we have already pointed out, omniscience in such a soul seems to be of a limited type. In the Yoga and other systems also, omniscience has been attributed to souls, *about to attain the final liberation*. But in the case of these souls also, omniscience seems to be limited. The omniscience attributed to the liberated souls by the Jainas, on the contrary, is perfect, unrestricted and unlimited. It seems to us that the omniscience, attributed to the liberated souls by the Jainas resembles that attributed to the Isvara by the Vedic theistic schools.

According to the Jainas the *jīvas* are omniscient by nature. Just as pure and clear water becomes muddy on being mixed with clay, in the same manner, the naturally omniscient *jīvas* wander in the *samsāra* in an in omniscient state of knowledge, being polluted by the dirt of *karma*. As soon as the clay is removed, water resumes its clearness and purity ; in the same way, the *jīvas* also resume their pure state of omniscience, when they succeed in removing the *karma* impurities from them by dint of self-culture and self-development. The liberation of a *jīva* means its liberation from the influence of *karma*. In the liberated state of a soul, all *karma*-forces covering pure knowledge and omniscience are absolutely set aside. Accordingly, *mokṣa* or liberation has been described as—

*samastāvaraṇa-kṣayapekṣam*

—*Pramāṇa-naya-tattvālokālaṃkāra*, 2, 23

i.e. dependent on a complete annihilation of all (the *karmas*) that cover (knowledge); '*kevala-jñāna* arises in the soul automatically as soon as these obstacles or *karma*-coverings are removed from it. *Kevala-jñāna* is omniscience and as conceived by the Jainas it is not at all limited in any way—

*nikhīla-dravya paryāya sākṣatkārī svarūpam kevala-jñānam*

—*Pramāṇa-naya-tattvālokālaṃkāra*, 2-23

Omniscience consists in a direct apprehension of all the things with all their modes.

In a liberated soul are directly revealed and clearly known all the things of the universe, past, present and future with all their infinite qualities, modes and aspects. Omniscience, as conceived by the Jainas, is thus unlimited, infinite, unrestricted and all embracing. It seems to us, that such an omniscience might have been attributed to Isvara by some of the theistic systems of India ; but none of them appear to have thought it possible in a soul, either as emancipated or as approaching emancipation.

# Omniscience a Fiction or a Fact

G. R. JAIN

Every thought is preceded by material vibrations in the brain. These brain waves are not a myth now, but hard facts of experiment. It has been possible to record them on paper and the records are known as incephalograms. They have been transmitted across the Atlantic and received at the other end (a sort of telepathic transmission with the help of machines). In fact they are electro-magnetic waves of ultra-ultra short wave lengths. When the brain acting like a miniature radio-receiver is properly tuned, the waves from outside are received in. In fact a thought can be looked upon as influx of foreign energy into the soul. Prof. Albert Einstein astounded the world by his great discovery that energy is matter and matter is energy. Every thought, therefore, which precedes our action, involves coming in of some foreign matter unto the soul. The Jaina theory of *karmas* which postulates the association of subtle matter with the soul at every moment of our life, and which has been given the name *karma vargaṇā* and is included amongst the six divisions into which matter has been divided under the name *sukṣma*.

Souls are divided into two categories, mundane and pure. A mundane soul is closely associated with matter which flows in as a result of our thoughts and consequent actions. As every kind of matter is subject in Newtonian forces of gravitation, the poor mundane soul stands no chances of flying away from the grip of the Universe which is filled with matter on all its corners. But when this association with karmic matter is annihilated, the soul begins its upward journey like a hydrogen balloon. Hydrogen atom is the lightest among matter and, therefore a hydrogen balloon would go up as far as meets the hydrogen layer of the upper atmosphere provided it is prevented from bursting by the rays of the sun. Soul is lighter still, in fact, it is the lightest we can think of, because it is non-material and rises to the top of the universe beyond which there is no medium of motion.

Pure soul is Effulgence Divine in which the consciousness inheres although the science of today is trying to search consciousness in the protein molecule. If some day the biologists succeed in manufacturing the protoplasm, the philosophers will have to discard the soul and think

in some other way. Already some constituents of protoplasm like nucleic acid have been synthesised. For the present we have to fall back upon the hypothesis that a pure soul is all knowledge and all things and events are automatically reflected in its past, present and the future. In other words, pure soul means perfect knowledge. According to Jaina school of thought, as a mundane soul gradually purifies itself more and more its power of knowing the truth increases and when it becomes fully purified the whole Truth dawns upon him automatically just as a mirror begins to reflect things when dust is wiped off from its surface ; that is, we can know the truth by Eye Divine or *divya-dṛṣṭi*. This is one way of knowing the truth where there are no chances of making any mistake through illusion. The second method is the method adopted by the modern science, viz., experimental. Experiments are performed by different people all over the world ; and if they arrive at the same result, the conclusion drawn is regarded as correct or true. Even some scientists of today are of opinion that the experimental method is not the only method of arriving at the truth.

Without going into philosophical implications of omniscience as defined by Jaina Acaryas, I am giving below some points in answer to a question once asked by a friend, 'What evidence is there to prove that the Jaina Tirthankaras were Omniscient' ?

The ancient writers, like the author of *Nandī Sūtra*, have tried to overawe us by saying that the Fourteen Purvas which constitute a negligible portion of the entire Jaina canon, required such a huge sea of ink into which over sixteen thousand elephants, one mounted over the other, would be completely submerged or that it will take a few billion years to utter the twelve Angas of *Jina-vāṇī* at the rate of a few thousand words per minute. Naturally, words spoken so fast would lose their intelligibility and would appear like a row of thunder. So, they said that the entire body of a Tirthankara vibrates and the sound produced is inarticulate which is analysed into different languages of human beings, and those of birds and beasts, as if by some natural process akin to the mechanical process adopted in the meetings of the United Nations where the talk of a speaker in any language is automatically analysed and heard in the language of one's choice.

In the modern age of science, arguments of the above type would be regarded as silly to prove the perfection of knowledge of any person on earth. But the whole problem cannot be dismissed cursorily. We take points one after another.

(1) **The Unit of Three Dimensional Space**—It corresponds to Euclidean space point. In Jaina terminology it is called *pradeśa* and has been defined as the smallest volume of space in which only one atom can reside, but in which as infinite number of atoms can reside under special circumstances. This is a contradiction in itself. How can an infinite number of atoms occupy the same space which only one atom occupies? And the answer given is *sukṣma-pariṇāma-avagāhana śakti-yogāt* (on account of the subtlety and accommodating power of molecules). The modern science has discovered a substance called nuclear matter, first of all discovered by Adams, which is two thousand times denser than platinum, the heaviest metal known on earth. The formation of such a matter in certain stars can be explained in no other way but by saying that somehow a very large number of atoms have become packed in a small compass in nuclear matter. Writing about the nuclear matter the great astro-physicist A. S. Eddington once said that one ton of nuclear matter can be easily carried in a waist coat pocket.

(2) **Einstein's Principle of Equivalence between Matter and Energy**—This principle is epitomised in the equation  $E=mc^2$ , and in the common parlance it means that one gram of any kind of matter when fully changed into energy is equivalent to quantity of heat which would be produced by the burning of three thousand tons of best variety of coal. If we peep into the history of development of science, we come across very funny ideas about heat, light and electricity. That these are manifestations of energy was realised very late. It is a bit surprising that in the Jaina scriptures it is clearly mentioned that out of the six different forms into which matter manifests itself, namely, solid, liquid, gases, energy, karmic matter and elementary particles, heat, light and electricity belong to *sthūla-sukṣma* class (*chāyātāpadyāh sthūletarāh*). It means that the perfect identity between matter and energy was known to us although the quantitative relation given by Einstein was missing. It is this identity between matter and energy which ultimately led to the development of the atom bomb.

(3) **Pudgala**—This is rather a peculiar word for Prakṛti (Nature) or what is more popularly known as matter. But it is full of inner meaning as defined in the following words *pūrayanti galayanti iti pudgalah* (that which undergoes modifications by combinations and dissociations). Today one whole branch of physics deals with these disintegrations, natural and artificial. We know that an atom of uranium naturally dissociates into an atom of radium and finally after undergoing some intermediate changes into the form of lead. When the nucleus of nitrogen

atom is bombarded by an alpha particle the alpha particle becomes embedded into the nucleus and an atom of oxygen is formed. This is an example of change in *pudgala* by *pūrayanti* process. When a lithium atom is bombarded by a proton the resulting atom bursts and two alpha particles fly in opposite directions. This is a case where modification is introduced into matter by *galayanti* (fission) process. Such examples are without number and need not be multiplied. The atom bomb is a case of *galayanti* process and a hydrogen bomb a case of *pūrayanti* (fusion) process.

(4) **The Electrical Nature of the Atom**—Kanada is said to be the father of ancient atom who explained the position of atom into the matter. Many Greek philosophers like Democritus and his followers, John Dalton in the nineteenth century, gave a clear concept of the atom until we come to the time of Sir Rutherford about 1919 who gave the planetary model of the atom and pointed out that atom is an assemblage of positive and negative electricity. It is significant to note that the electrical nature of the atom was already known to the Jaina writers and we read in *sūtra* 33 of *Tattvārthādhigama Sūtra*, Chapter V *snigdha-rukṣa-tvād bandhah*. These words *snigdha* and *rukṣa* refer to positive and negative electrifications because Umasvami in the *Sarvārtha-siddhi* clearly states that lightning discharge in clouds is produced by the qualities of *snigdha* and *rukṣa* that is due to the development of positive and negative charges. The same thing has been hinted at by Dr. B. N. Seal in his book. *The Positive Sciences of Ancient Hindus* (London) when he says that the crude and immensely suggestive theory of chemical combinations (of the Jinas) is possibly based on the observed electrification of smooth and rough surfaces as a result of rubbing.

(5) **The Size of the Universe**—Leaving aside the question of the shape of the Universe, the Jaina writers have given the volume of the Universe as 343 cubic *rajju*s according to Digambaras and 239 according to Svetambaras where according to Colebrooke *rajju* is the distance which Deva flies in 6 months at the rate of 2,057,152 *yojanas* in one *kṣana* or instant of time. Compare it with the size calculated by Einstein according to which the radius of the Universe is 1068 million light-years, where light-year is the distance travelled by a ray of light to one year at the rate of 186000 miles per second. Although on account of the uncertainties involved in the magnitudes of the *yojana* and the instant of time, it is difficult to make a comparison. However, the *rajju* comes out of the order of 1021 miles (that is 1 followed by 21 zeroes). There are various theories about the creation of the Universe, the Big Bang theory being the most popular which postulates that in the beginning of time the

Universe was in the form of material highly concentrated corresponding to Brahma's golden egg, which began expanding suddenly and is expanding even today. This expansion of the Universe has been concluded on the basis of the feeble red shift of the spectral lines. The present theory about the creation of the Universe which is known as continuous creation theory is at present finding favour with the scientists and represents the Jaina view according to which the Universe is not expanding, has a fixed volume, and will continue to exist as such in future. Sri Deepak Basu of the Institute of Radio Physics of Calcutta has published a very learned article in *Science and Culture* in April 1964. He writes as follows :

“The well-known red shift has been explained recently from Einsteins' theory of Relativity as due to gravitational field of the galaxies. In case this theory is accepted the idea of the expansion of Universe will be ruled out and the other two theories discussed so long evolutionary and steady state which are based on expanding mechanism will be abandoned.”

(6) **The Ether and the Field**—So far as the constituents of the Universe are concerned two things are very peculiar to Jainism. One is the luminiferous ether pervading every iota of space (to which they have given a peculiar name *dharma dravyā*) which accounts for the medium of motion for matter and energy, and the other the electromagnetic field which they have called *adharmā-dravya*. Both of them are non-material and all-pervading. In order to account for the stability of the Universe Einstein postulated the idea of curved space a very hard pill to swallow. If the Universe is to remain stable its total energy content should remain the same. If it were losing energy constantly its stability cannot be guaranteed. In order to prevent energy from going out Einstein said our Universe is finite in three spatial directions and infinite along the fourth dimension of time. In a curved space like it, the energy travelling outward would be reflected at the boundaries of the Universe and there will be no loss of energy. The Jaina thinkers gave an alternative explanation. According to them there is no medium of motion beyond the finite Universe and therefore matter or energy in any form cannot go beyond it and they have accordingly divided space into two divisions the *lokākāśa* and the *alokākāśa*, the finite Universe and the infinite Universe beyond it. This is a more simple explanation of a difficult puzzle. The *adharmā dravya* is the cause of cosmic unity through which those forces operate which keep the fundamental particles from flying away inside the atom, keeps the atom inside the molecules and the molecules inside the crystehls.

We started to give an answer to the question: ‘Were the Tirthankaras Omniscient?’ and we have come to the end of our reply. Whether they were omniscient within the perview of the definition given, I leave the reader to judge for himself. What I have placed before the reader is that the facts described within the last half a dozen paragraphs (1) to (6) which have been discovered by the great pioneers of science working day and night in their laboratories and elsewhere and spending stupendous sums of money were already placed before us (not of course with very great details) by our Jaina Tirthankaras. We can only imagine what a divine foresight they must have possessed who laid bare before us the mysteries of the biggest and the smallest, the Universe and the atom.



# Beginning of Bandha with Special Reference to Jaina Philosophy

KAMALA JOSHI

The soul in *samsāra* is associated with some of its material limiting adjuncts, viz., body, mind and speech. Even then it is known to be transcendental. It is the inspirer of all organs. etc. as an instrument requires an agent.<sup>1</sup> The inter-relationship of the soul with senses, attachment, aversion, pain, rebirth, etc. has been named as *bandha* (bondage) in philosophical term. All schools of philosophers are unanimous in asserting that ignorance (*ajñāna*), non-discrimination (*aviveka*), attachment (*āsakti*), aversion (*dveṣa*), love (*rāga*), hate (*ghṛṇā*) and passions (*āvegas*) give birth to bondage.<sup>2</sup> Undoubtedly, in its inherent state, soul or *ātman* is totally unaffected by the varied complexities of ordinary life but influences of passions and *karmas* result in *new karmas*. The character and fate of each individual along with the whole world in its present state are the outcomes of good or bad deeds done in previous lives. All sorts of results whatever they may be have to be borne at present or in future. This type of feeling is inherited into Hindu thinking through ages.<sup>3</sup> It has been an important goal of all philosophers and saints to devise a way out to make *jīvas* free from the *bandha*. It is held that the realization of the pure self is the ultimate achievement of continuous cycle of birth and rebirth.<sup>4</sup> As a ripe fruit lying on the ground cannot be attached to the parent tree, similarly *karma* once destroyed cannot involve the soul in *samsāra*. Due to its interaction with matter

<sup>1</sup> *atmendriyadyadhithata karanam hi sakartrkam, Bhasa-Pariccheda*, 1/47.

<sup>2</sup> *Bṛhadaranyaka Upanisad*, 4/4/5 ; *Nyaya Sutra*, 4/1/3 ; *Vaisesika Sutra*, 6/2/14 ; *Gita*, 2/62 and 63 ; *Yoga Sutra*, 2/3 ; Joshi, K. S., *Yoga and Personality*, p. 40 ; *Tattvartha Sutra*, 8/2 ; *Saddarsana Samuccaya* (ed. by Prof. Murty), notes on *Karika* 7, p. 15.

<sup>3</sup> Cf. 'The Mysteries of Karma Revealed by a Brahmin Yogi', Allahabad 1898, quoted in the *Six Systems of Indian Philosophy* by Max Muller, p. 109. The results mentioned in the Scriptures accrue to the doer of the action—this is general rule, *Purva Mimansa Sutra*, III. VII, 18.

<sup>4</sup> *Mundaka*, 2/2/8, 3/2/8 ; *Tattvartha Sutra*, 10/2, 3 ; *Nyaya Sutra*, 1/1/22 ; *Vaisesika Sutra*, 5/2/8, 6/2/16 ; *Samkhya Karika*, 64 and 65 ; *Yoga Sutra*, 2/25, 3/34, *Saundarananda*, 16/28-29 and *Saddarsana Samuccaya, Karika*, 52.

the *jīva* got transformed and has become *mūtra* (material) or one having a shape.<sup>5</sup>

Here the focus is on the theory and principle related to the origin of *bandha* with special reference to Jaina philosophy. According to the notion of the Jain Acaryas, it is not the agent of material *karmas* but of its *bhāvas* which being tinged with passions receives *karmas*. They accept *karma* as *dravya*. The karmic matter in Jainism is analogous to *prakṛti* in Sankhya or *māyā* in the Advaita Vedanta.<sup>6</sup> The Jaina thinkers give considerable importance to the interaction of *karma* and *jīva* with each other. The relationship between them is identical to that of milk and water mixed together or heat and an iron rod.<sup>7</sup> They uphold the view that *jīva* and *puḍgala* are invariably concomitant throughout the life of a living being. The states of thought being instrumental in the arrival of *karmas* are named *bhāvanā bandhas*, while the bondage of the soul due to the impurities of *karmas* is termed as *dravya bandha* in Jaina philosophy.<sup>8</sup>

Consciousness is the self or the self is the substratum (*aśraya*) of knowledge yet it becomes *ajñānī*. Now the question is as to how or rather why the bondage or union of *karma* gets underway? How the *prakṛti* of Sankhya gets disturbed and the union of *puruṣa* occurs at first? How the material *māyā* of the Advaita Vedanta does lure the *jīva*? And how the union of matter and the soul takes place in other philosophical views? Karmavadin deal with it and have their views about it. The above mentioned union must have its origin but it shall not be infinite or eternal. If it remains eternal the *mokṣa* (liberation or absolute separation) of *jīva* and *karma* shall become unattainable, though *mokṣa* has been an ultimate aim of human life according to all saints and philosophers. They unanimously hold that the aforesaid relationship is beginningless but not clear on how the relationship started at first as both are absolutely different from each other. Attachment, aversion, passions are undoubtedly the main causes of bondage, and chain of *karmas* pains and passions does begin from bondage as mentioned above but how the *bandha* originates itself? If the bondage is the play of God, why does it affect the *jīva*? It is obvious that *karma*

<sup>5</sup> *Dravya Sangraha, gatha 7.*

<sup>6</sup> *Pravacanasara* with introduction in English by A. N. Upadhye, p. 68; Hiriyanana, *Outlines of Indian Philosophy*, p. 158.

<sup>7</sup> Notion of Gunaratna as quoted in *Saddarsana Samuccaya*, notes on *Karika* 51.

<sup>8</sup> *Dravya Sangraha, gatha 32*; Dasgupta, S. N., *A History of Indian Philosophy*, Vol. I, p. 193.

is not the soul's creation. Due to ignorance etc. the cycle of the world takes place. Every effect must have its cause. Thus causes of attachment aversion, ignorance etc. are to be ascertained at first.

It is right to infer from the fact that the relationship between matter and the soul is beginningless and endless as it is still undetermined. None knows its start and end. Being eternal it is improper to speak of its origination, but the starting and ending (*sādi* and *śānta*) have to be there. Otherwise the separation of *jīva* and *karma* would become a mirage proving all philosophical ideas futile. Some old Jaina thinkers hold that *bandha* is not the connection of *jīva* and *karma*. It is mere touching of each other. This concept was not universally recognised but is thought to have been originated by misunderstanding of relationship between *karma* and *jīva*. In Jaina philosophy relationship between them is not illusory like Vedanta nescient and mere touching. It is a profound connection.

Three attributes are possible about *bandha*. Firstly, *jīva* comes earlier to *samsāra* than *karma*, secondly *karma* precedes *jīva* in *samsāra* and thirdly *karma* and *jīva* come to *samsāra* simultaneously.<sup>9</sup> Acceptance of any of the three views would contradict all philosophical notions. Therefore, they are not desirable (*iṣṭa*). If the *jīva* comes in *samsāra* during non-existence or *abhāva* of *karmas* (without any reason) it can become free without any cause. Origin of *samsarī jīva* before *karma* and vice versa are thus not based on argument (*reductio ad absurdum*). Therefore these are not acceptable as *jīva* executes *karma* and hence is called as *kartā*. Thus *karma* itself can't come into *samsāra*. It shall make the origin and decay of *karma* without any reason. If arrival of *karma* and *jīva* both happens to be simultaneous then *jīva* cannot be termed as *kartā* and *karmas* or actions as *kārya*. This relation between the body and *karma* is analogous to seed and shoot or coherent cause and effect. At first *jīva* comes into being in body through *karma*. Afterwards it originates *karma* through passionate actions of body, mind and speech. This, chain of body and *karma* seems to be beginningless. *Bandha* of *jīva* and *karma* is also identically beginningless in the same manner.

The beginningless things are not bound to be endless. Beginningless alludes to time of *bandha*. It means a fairly long time beyond definition.

<sup>9</sup> *Bhasya* on *Nyaya Sutra*, 3/1/4; *Nyayakarikavali*, *Prataksya khandā*; *Samkhya Karika* 11 and 19; Bhatt, Govardhan P., *Epistemology of the Bhatta School of Purva Mimamsa*, p. 388; *Tattvartha Sutra*, 2/8.

If one between seed and shoot is destroyed before producing its effect then this beginningless chain of seed and shoot is ruptured forever. By citing this example Jaina thinkers elucidate the time of *bandha*. Similarly the chain of *jīva* and *karma* is destroyed forever by Right Faith, Right Knowledge and Right Conduct, Yoga, Bhakti etc.<sup>10</sup>

As a matter of fact from the psychological standpoint, this inherent chain of cause and effect or *bandha* cannot be doubted. Attachment, aversion, ignorance etc. are known as the root causes of sufferings. The main point of discussion is not how or why the *bandha* begins and pure self becomes impure at first, but they are more concerned with the problem pertaining to the removal of *bandha* alongwith its reality behind it. Initially all the *jīvas* are *samsārī* according to Jaina philosophy. They are liberated. This concept can be proved by logic to some extent. The beginning time of *bandha*, attachment etc. are indescribable and eternal. Actually the beginning time of *bandha* is not more important topic to be discussed in philosophy than the liberation from it. After the attainment of liberation from attachment aversion or *bandha*, the *karmas* exist but they do not bear fruit as the burnt seeds do not sprout in plants and the *bandha* becomes *śānta*.

<sup>10</sup> *Visesavasyaka Bhasya*, gatha 1638, 1905-11.

<sup>11</sup> *Tattvartha Sutra*, 1/1 ; *Yoga Sutra*, 2/43 ; *Yoga Pradipa*, 113.

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