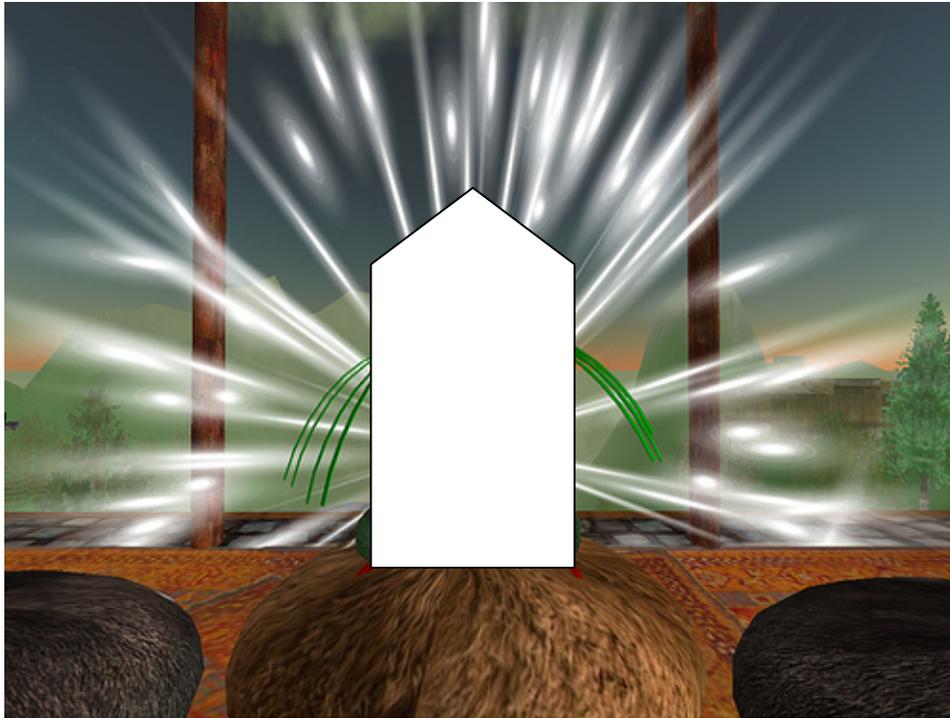


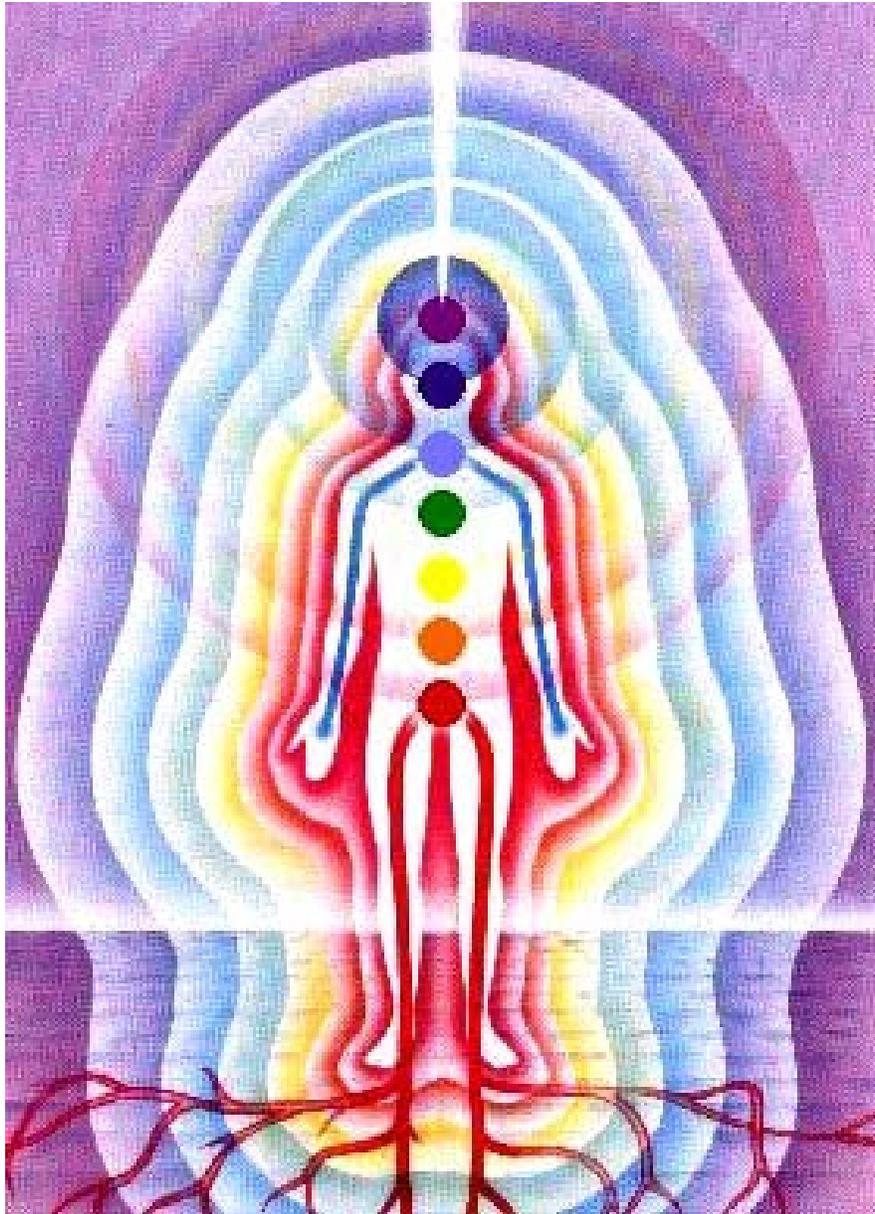
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# ***Jainism: The Eternal and Universal path for Enlightenment***



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Front jacket cover inside

#### About the Book

Observation of nature reveals that it has been following a well defined path of evolving consciousness to ever increasing higher levels since eternity. Some of the principles nature employs in this pursuit are the same as enunciated by Jainism. The main aim of Jainism is also to develop consciousness to higher levels and it specifies certain procedures for achieving this goal. These procedures or the path for achieving enlightenment is universal in the sense that it can be adopted by any one seeking enlightenment. The book describes some of these lessons we can learn by studying nature using scientific methods and compares them with the Jain scriptures.

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## *Preface*

Amongst the various “religions”, “faiths” or philosophical sects known to mankind, Jainism is not a “religion” or “faith” in the normal sense. It is actually a “path” enunciated by the Enlightened souls (*Arihants*) who were born ordinary persons and attained enlightenment by following this path. These Arihants belonged to any nation, religion, creed, class or society and therefore Jainism is not restricted to any particular group of people. In this sense it is universal. It is said that at any time there are millions of enlightened souls (*Kevalis*) in the universe. There may surely be other paths but Jainism is certainly a path for attaining enlightenment, enunciated by the Enlightened beings for those who seek enlightenment. It has well defined milestones (*Gunsthans*). They are fourteen in number (Chapter 5). *Gunsthans* (stage) 1 and 2 are starting points and stage 14 is considered to be the ultimate goal of every living being. The procedure for completing this journey is the main goal of Jainism. One is born in various *yonis* (species) which should be treated only a detour from this path to enlightenment and once, one is back from these loops as a human being on the main path, one can continue the pursuit of this goal.

Jainism has given equal importance to the understanding of the physical universe and individual’s physical, mental and spiritual development. All these aspects are equally important for achieving the goal. Unlike some other oriental religions, it does not consider the world as an illusion, nor does it believe in a supreme “God”, the Creator. It claims that both, living and non-living, are governed by certain laws and in this sense it claims itself to be quite scientific. It believes in the laws of causality in spiritual as well as physical realms, as modern physics claims for the physical universe. There are, of course questions of fundamental import for both, those who believe in God and those who do not, that can not be answered satisfactorily and are beyond logic. If God created every thing, who created God? The answer is that he is eternal, self created or swayambhu. The same questions arise for those who believe in nature or laws that govern the universe. Who created laws and why the laws are as

they are and not different. Why, for example, the gravity decreases as inverse of the square of distance and not linearly or as cube? The atheist can take refuge behind God who created the laws as they are, but then this only takes the question only one step back. We can only say that the nature is like this, like what we observe. The laws are eternal and are in the nature of things. Why it is so, the language is inadequate to express it satisfactorily. To find a deeper meaning to the answer one must strive for enlightenment. This is the purpose of Jainism.

The basic approach of Jainism is that the purpose of all living beings is to develop consciousness to the fullest extent. The Universe consists of two entities: *jiva* (living) and *Ajiva* (non living, which includes matter and other entities that control its transformation). The ultimate goal of *jiva* is to completely dissociate itself from material and attain a pure state whereafter it resides on an edge (the upper edge: *Siddha shila*) of the Universe, separated completely from the material world. That is probably the ultimate state, where *jiva* and *ajiva* are completely separated and free of each others influence, towards which the whole universe is evolving. To understand the basic approach of Jainism and to understand the path to enlightenment, it may be desirable to reinterpret Jainism in terms of modern thought and amalgamate it, as far as possible, with modern scientific knowledge.

Jain darshan (or philosophy) is one of the oldest and original system, independent of all thoughts, conceived and enunciated by Rishabha, who reigned over India. The time of his rule is not well determined. It is certainly pre-Indus (older than 1500 BC) since seals depicting Jain saints and practitioners of Jainism are found in Mohan Jo Daro, Harappa, Mathura and other sites and inscriptions of *Siddhas* and Arhats are found in Udaigiri hills and Hathigumpha. It is also mentioned in Ṛgveda, considered to be the oldest book in the world (ca ~3000 BC) and also Yajurveda, written a little later. Lot of research has been done on the antiquity of Jainism, to ensure that it is not an offshoot of Vedic or Hindu philosophy (as is sometimes mistakenly believed). In fact many Jain concepts are contradictory to Vedic concepts. I do not wish to go into these details here, except to mention that Jain Arhats (Rishabha and his parentage) and sadhus (called *Vratya* or *Vatarsana muni* or *Nigantha*) are

quoted in some of the oldest sacred hindu scriptures like Shri Bhagvatpurana, Vishnu purana, Padma purana etc. The inquisitive reader may like to refer to some of these references, given at the end of this chapter to appreciate the originality of thought and antiquity of Jainism.

Over the millennia since Rishabha, Jainism propagated through practices and preachings. Parashva, about 2900 years ago preached the Chaturyama *Dharma*: the four fold religion based on abstinence from violence (himsa), falsehood and stealing and acquisition of material things. 250 years later the last of the Arihants, Mahavira, introduced *Brahmacharya*, generally equated to celibacy, as an essential requirement for attaining salvation. The basic essence of Jainism was compiled by the immediate disciples of Bhagvan Mahavir, who preached Jainism about 2600 years ago. These disciples, the “Gandhars” were omniscient (shrut *kevalis*) and described various theories of Jainism and Jain practices. Later these teachings were memorized verbatim by sages for several generations and were ultimately documented in scripture form known as Agams, several hundred years after Mahavir’s nirvana. These sutras were divided into two major groups: *Ang Agams* containing direct preachings of Mahavira which consist of 12 texts. The twelfth text is called *D’stiwad* (which included 14 Purvas) and *Ang-bayha Agams* which provide explanation of *Ang Agams*. There is difference of opinion on the number of Ang-bahya agams and their numbers vary from 14 to 34 as accepted by various Jain sects.

Around 350 BC, after about 250 years after Mahavira, there occurred a difficult period of continuous famine for twelve years resulting in a break in the tradition of memorizing Agams and during this period a significant number of Agam sutras were largely forgotten. The Digambars consider *Shatkhand Agam*, written by Acharya Pushpadant and Bhutbali (and its commentary **Dhaval tika**, written by Acharya Virsen) and *Kasay Pahud* written by Acharya Gundhara between 100 to 900 AD (and its commentary later written in 780AD by Virsen and Jinsen) and four Anuyogs (which includes about 20 texts) as their main texts. These four Anuyogs are *Padma Puran, Harivansh Puran, Adi puran and Uttar Puran* written between 650 and 879 AD, which constitute *Dharma Kathanuyog; Charnanuyog* (consisting of **Mulachar,**

**Trivarnachar and Ratna karanda-Shravak Achar**); *Ganitanuyog* (consisting of *Surya-prajnapati*, *Chandra-prajnapati*, *Jaya-dhaval-tika* and *Gommat-sar* (written 780-1000AD) dealing with astronomy, astrology, geography, and mathematics. The philosophical doctrine, theories, metaphysics, Tattvajnan, are contained in **Dravyanuyog** which consist of **Niyamasar**, **Panchastikaya Pravachanasar** and **Samaya-sara** written by Acharya Kundakunda (ca 100 AD); **Tattvartha-sutra** by Umaswati (~200 AD) and its commentaries and **Aptamimamsa** by Samantbhadra (600AD) and its commentaries by Akalank and by Vidyanand (800 AD).

Shwetambar, on the other hand, held several conferences<sup>1</sup>, at Patli Putra (about 367 BC), Orissa (~150 BC), Mathura (~310AD) and two at Vallabhi (~454 and ~300AD) to document the scriptures, as far as they could be remembered. The Swetambar texts are **Acharang Sutra (Aayarang)** describing the conduct and behavior of ascetics and penances of Bhagwan Mahavir; **Sutrakratang Sutra (Suyagdang)** describes nonviolence, Jain metaphysics, and the refutation of other religious theories such as Kriyavada, Akriyavada, Ajnanavada, and Vinayavada; **Sthananga Sutra (Thanang) and Samavayanga Sutra) describing various aspects of Jain metaphysics; Vhakhya Prajnapti or Bhagavati Sutra (Viyah Pannati):** This Agam explains the subtle knowledge of soul, matter, and other related subjects. Thirty-six thousand (36000) questions and answers are presented in this text for clarification of doubts. It is the largest of the eleven Ang-agams. **Jnata Dharma Kathanga Sutra (Nayadhammakahao)** explains Jain principles through examples and stories. This text is useful in understanding the mode of Bhagvan Mahavir's

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1. Based on *Jain Agam Sahitya* by Devendra muni. Other scholars have given slightly different dates for the conferences.
  2. There are 12 original scriptures (*Agams*) of Jains, but the last Dfshtivād, which had 14 Purvas, was lost about 2000 years ago but has been referred in, *Sāmāvayang*. Its 7<sup>th</sup> Purva is referred as *Atmapravād* and deals with six fundamentals. They were described by Acharya Siddhsen Diwakar in *Sanmati Prakaran* about 1800 years ago (cf *Atmasiddhi* by Srimad Rajchandra).

religious preachings. **Upasaka Dashanga Sutra (Uvasagdasao)** explains the code of conduct of the ten followers (Shravaks) of Bhagvan Mahavir. This *Agam* is useful for understanding the code and conduct of individual seekers (Shravaka *Dharma*). **Antah Kradashanga Sutra (Anatagaddasao)** tells the stories of ten sacred monks attaining liberation (*Moksha*) by destroying their *karmas*. **Anuttaroupa Patika Dashanga Sutra (Anuttarov Vaiya Dasao)** contains the stories of additional ten monks who attained the top-most Anuttara heaven. **Prashna Vyakrana Sutra (Panha Vagarnai)** describes the five great vows (mahavratas) and the five worst sins defined in the Jain religion. **Vipaka (Vivagsuyam)** explains the results of good and bad *karmas* through several stories. **Drstivada<sup>2</sup>**, the twelfth Ang-agam is of vital importance but is considered lost by all Jain Sects. Its description, which is found in other Jain Sutras, indicates that this Ang-agam was the largest of all the Agam Sutras. It was classified in five parts;

(1) **Parikarma** (2) **Sutra** (3) **Purvagata** (4) **Pratham-anuyoga** and (5) **Chulika**. The third part, **Purvagata** contained 14 purvas. They contain the Jain religion's endless treasure of knowledge on every subject. Some scholars believe that it was named as Purva because it contained the knowledge which existed before Bhagvan Mahavira, largely the preachings of Bhagvan Parshvanath. Srimad Rajchandra, born about a hundred years ago could recall the 7<sup>th</sup> purva through the knowledge of his previous births (Jati smaran), which he heard directly from Bhagvan Mahavir as one of his disciples in a previous birth and summarized it in his book *Atmasiddhi* and thus can be taken as authentic (Chapter 2) version of this section of *Drstivad*.

The various Svetambar Upangs illustrate the teachings of Bhagvan Mahavir by stories and include **Aupa Patika Sutra (Ovavaiya)** which describes the view of King Konika when he visited Bhagvan Mahavir. It also explains how a person can attain heaven in the next life; **Raja Prashniya Sutra (Raya Pasen Ijja)** describes the story of sage Keshi. Keshi was the Ganadhara of Bhagvan Parshvanath. He removed the doubts of King Pradeshi regarding the existence and attributes of the soul. **Jivabhigama Sutra** describes the universe and the subtle description of all living beings (souls) of the universe. It deals with various aspects of biology and botany. **Prajnapana Sutra (Pannavana)** describes the form and attributes of souls from a

different perspective. **Surya Prajnapti (Surya Pannati)** and **Chandra Prajnapti** dealing with astronomy, motion of Sun and Moon; **Jambudveepa Prajnapti** deals with geography and history: The other four **Nirayarvali Sutra**, **Kalpa Vatansika Sutra (Kappavadamsiao)**, **Pushpika Sutra (Puspiao)**, Pushpa Chulika Sutra, **Vrashnidasha Sutra (Vanhidasao)** describes some events and stories during ancient times. Besides there are several **mool sutras like Avashyaka Sutra** describing the daily rituals or routines, which is necessary for purification of soul, are called Avashyak (essentials; Chapter 6). A description of the six routines Samayika, Chaturvinshatistava, Vandanaka, Pratikramana, Kayotsarga, and Pratyakhyana are explained in this Agam. The very important **Uttaradhyayana Sutra** containing preachings regarding religious principles and practices, and many stories, dialogues, and examples based on such principles and practices and **chulika sutras (eg Nandi sutra**, dealing with various types of *gyans*) are also main **Upangs**.

The purpose of mentioning the principal Jain scriptures above is two fold. Firstly they provide the source material on Jainism so that the readers who are interested in original texts can refer to them. Secondly and more importantly, we want to emphasise that the texts are only “compilations” by knowledgeable saints and scholars. They were documented many centuries after Bhagvan Mahavir and although they contain answers given by the Enlightened Arihants, they have been recalled from the memorized versions. For this reason, they need not be taken as accurately *verbatim* because of various limitations in memorizing due to passage of time, evolving interpretation over ages and the influence of other cotemporary thought. The rigidity with which one should take them as the “word of the Lord” should therefore be critically borne in mind.

This book is not intended to be a rigorous exposition of the Agams; rather it attempts to bring out their main aspects in a simplistic and easily understandable way, trying to find some common ground between Jainism and modern science. One should also bear in mind that the original preachings of Mahavir were in Ardh-Magadhi or Prakrit, a language long forgotten by the masses and replaced first by Sanskrit and later by Hindi and other regional languages. It is customary to stick to the original texts for sake of purity but although the concepts and cardinal points may be the same,

the language has changed over the many millennia and it is extremely difficult to comprehend the original texts, even by the learned scholars since it often includes an element of interpretation. It is difficult to ascertain the veracity of all the texts but, on comparing them with modern scientific observations, we come to the conclusion that some aspects such as the units of time and space, geography and some aspects on observational astronomy as described in these compilations, have been corrupted (Appendix 1) since they are mentioned differently in different places. This is reason enough to necessitate a critical assessment and interpret as many aspects as possible in terms of modern thought.

There are areas where religion and science are exclusive, ie in the domains of spiritualism, and there are also some areas where overlap between them exists, since as mentioned above in the subject matter of various texts, Jainism devotes as much importance to physics, chemistry, biology, botany, astronomy and geography, as it gives to spiritual aspects of soul, and procedures for its purification. There are bound to be disagreements but our effort is to reconcile the two where ever and to the extent possible.

This book is based on my notes prepared to understand Jainism. It should not be considered as an authoritative treatment but rather as a primer, compiled in a book form. The main purpose is that other seekers like me may find it useful and save time in their quest of getting familiar with Jain thought. The book is intended to introduce the reader to minimum basic concepts of Jainism, both in theory and in practice, and the procedures suggested for achieving enlightenment. It is not meant to be exhaustive, nor we quote much from the scriptures to authenticate the version presented here. A learned reader may find that rigour has been sacrificed for sake of simplification, but that is the approach taken in this book. As far as I could understand, Jainism is based on five pillars: atmavad, karmavad, anekantavad, Kriyavad and Lokvad. The book is divided in two parts, the first dealing with the first four aspects and the second part dealing with various aspects of Lokvad. Thus, the first part deals with basic tenets of Jainism and the second part compares Jain thought with various branches of science

like physics, cosmology, chemistry and biology. After arguing the universal applicability of Jainism (Chapter 1), the book deals, rather briefly, with the main foundations of Jainism ie The cardinal truths (Chapter 2), *Anekantvad* and *Karmavad* (Chapters 3 and 4). There are numerous books and treatises from learned and enlightened scholars on these aspects and therefore the purpose here is not to deal with these aspects in rigorous or comprehensive way but just to make the reader aware of the essential aspects of Jainism. The later part of this book, Chapters 5, 6, and 7 deal with the path recommended for salvation, as one goes to higher states (*Gunsthans*, Chapter 5), by practicing Jain procedures (Chapter 6) which also deals with their physiological and physical effects. The Part II of the book deals with a general discussion on Jain concepts in light of modern scientific knowledge: modern physics (Chapter 7), Cosmology (Chapter 8), combination chemistry (Chapter 9) and Biology (Chapter 10).

I have borrowed material from various sources and web sites and do not claim any thing original. Some times the material has been used without verifying their origin source and if there is any material which is not authentic, I stand to be excused. Some Hindi words have been retained as they are, since there are no equivalent words in English which can convey the same perception. Translation of some words in to English would have made this book unreadable and difficult to comprehend. Therefore knowledge of both English and Hindi is required to fully appreciate the implied meaning.

I hope that the book will become a bridge in our understanding of Jainism in context of science and provide a philosophic basis, which will be useful for an individual as well as the society and, in howsoever small a measure, make Jainism relevant to the modern way of life.

Narendra Bhandari

# Jainism: The Eternal and Universal path

*Truth is interwoven in the Universe*

*Fossil record on Earth, Nature's chosen path  
Universality of Law,  
Self and foundations of Jainism,*

## **Universality of Jainism**

Life is a sequence of situations and we continuously move from one situation to another, sometime struggling and some time sailing through smoothly to get the desired outcome. And soon we find that we are no more in a position to face the situations in an effective way and this struggle has taken up all our life. At the end it appears that the life has been wasted in trivialities. In the ultimate analysis, life is a zero sum game and the outcome would not have been different if we had chosen some other way of life. This can hardly be the purpose of life. As we will discuss in this chapter, in the scheme of nature, it can be shown that life on earth exists for a specific purpose. Any “religion” is expected to guide us to understand this purpose and help us realise it.

Every age has its specific problems and a “true religion” is expected to show the path to resolve these problems at all times, in all domains and in all possible situations. In this respect a religion should be eternal. Problems of conflict at all

levels, personal, societal, and national, terrorism, consumerism, impact of the life style on environment, to cite a few of them, are the hallmarks of current era and this does not lead to mental peace or satisfaction, as many will admit. Actually science and technology is progressing at such a fast pace, much faster than human mind can adapt to and the mental, philosophical and spiritual domains are not able to cope up with the physical aspects of life. There is no time to think what is right and what is wrong. Once there is a scientific discovery, technical progress can proceed with a rapid pace and can take control of our lives. It takes the mind significant time to comprehend, philosophise and transform and understand its implications. Failure of all religions to cope up with the progress of science is resulting in loss of their relevance in day to day life. To make philosophy and religion relevant to modern way of life requires that it be reinterpreted in modern, scientific language to meet the contemporary challenges. When contradiction is found between science and religion, the tendency is to choose the former, because it has made itself relevant to our daily needs. Science has made tremendous progress in the past 400 years and can not be ignored. Rather it should be synthesized and integrated with religion to make the philosophy more wholesome and comprehensive. Instead the puritans stick to the age old interpretations and follow them even if they can not be applied to day to day problems and be made relevant. This probably is the reason why people, even those who sincerely follow their religion, end up with gradual erosion of their conviction.

In an absolute sense, there is no measure or absolute criteria for right and wrong. What is right today in a given situation can be wrong tomorrow in another situation and what is nectar (*amrut*) for one can be poison for another. In this ambiguous situation it is difficult to decide what is the correct path, except that we must realize that we are the products of nature and the mother nature is all powerful and is always right. Scientific studies show that over the 14000 million years since the Universe formed from a great explosion, the “Big Bang” and 4500 million years since the Earth came into existence, *jiva* and *Ajiva*, both have evolved in a certain direction. It seems that the mother nature is proceeding with a goal, a goal of development of consciousness on Earth. We can therefore take cue from nature, first to determine

the direction in which it is going and then to decide the direction in which we should go, that is, with it or against it; help it in achieving its goal faster or work against it. We seem to have a choice. We take the help of science or guidance from nature to find and define the “path” the Earth has taken and then we can exercise this choice. Such an approach would not be subjective, nor it would be wrong.

### ***Nature’s path based on fossil record***

If we look at the history of evolution of species on Earth we find that over time the very primitive species have evolved into the most developed species. Life first started on the Earth about 3500 million years ago. Since then, the nature has been following a direction, a direction of evolution of consciousness. This record is preserved in form of fossils on Earth from the very beginning as shown in Figure 1. 1. Let us look at this record in some detail.

Evidence of whatever happens on Earth, in form of any activity involving either living and non-living, eventually gets washed off by rain and rivers in to the sea and deposits there together with the dust at the bottom. The history of life is preserved as fossils in these sediments. It is clear from these records that life on earth began about 3500 million or may be even 3800 million years ago with relatively simple one-celled micro-organisms, the first prokaryotes. They have existed and evolved for about two billion years longer than the multi-celled (eukaryotic) organisms and slowly evolved into mobile and flying species. Mammals and humans arrived on the scene very recently. The *Homosapiens* emerged only about 4 million years ago. This sequence or the tree of life is shown in figure 1.1. If we ignore the small perturbations which have occurred occasionally, we find the broad pattern that essentially the nature itself has followed a direction, a path of evolution of consciousness to higher and higher level. Thus we may conclude that the natural or “true” path is the one which evolves consciousness to a higher level. We can then say that every action which enhances the consciousness to a higher level is “*dharma*” and any step which goes in the reverse direction, ie reduces the level of consciousness is “*adharma*”.

Jainism classifies species in one sensed (touch) to five sensed (touch, smell, taste, hearing and vision) species. Nature seems to have started with one sensed organisms and evolved in to five sensed organisms. Jainism also mentions five types of knowledge (“gyan”): *Mati, Shruti, Aavadhi, Manahparyay and Keval* (omniscience). The evolution of species as found in the fossil records in deep sea sediments and the accompanying evolution of consciousness seems to follow this direction of acquiring knowledge from lower to higher level. Extrapolating this trend into the future, it can

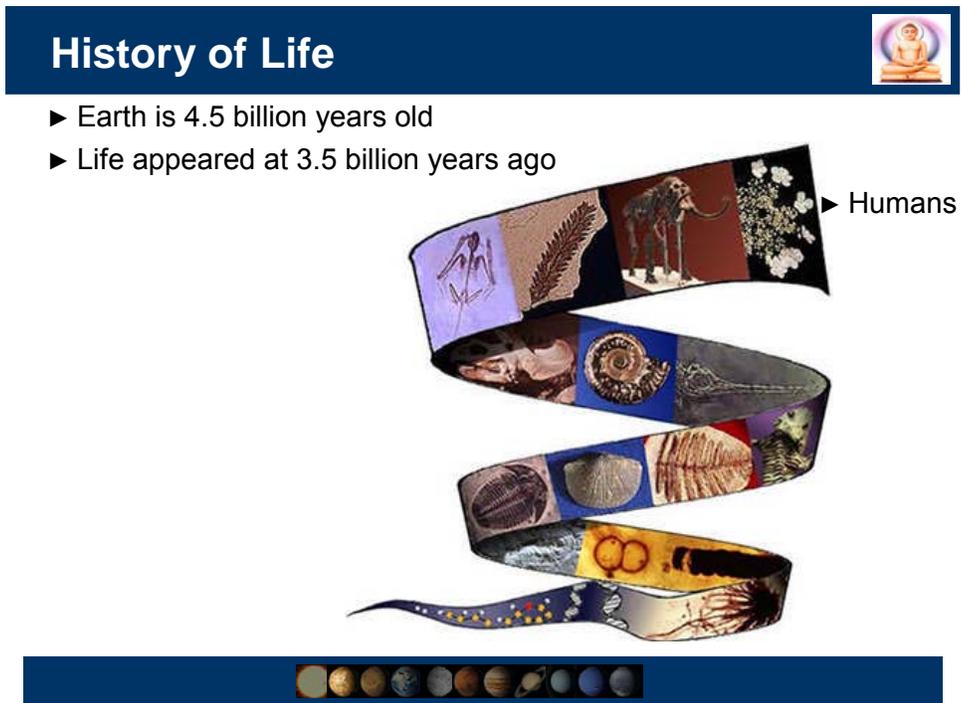


Fig 1.1. The evolutionary record of species on Earth, beginning with single celled species to multi celled species to marine species, to plants, mobile animals, mammals and flying species to humans. Humans first appeared on the earth about 4 million years ago

be predicted that the level of consciousness will develop further with time and a super human will no doubt arise. Jainism prescribes a methodology to attain higher level of consciousness, evolution to the next stage, expected in future, if nature continues to tread this evolutionary path. This stage will be accompanied by higher level of *gyan*.

Study of the fossil record in sediments has taught us many other things, some of which are summarized below.

1. As mentioned above, evolution of consciousness has been the path taken by nature: from single cell to multi-cellular, to more complex marine species and ultimately to mammals and to humans via a detour through plants etc describes the direction of this evolution. The most primitive species (e.g. algae) had only *mati gyan* and later the higher species (mammals e.g.) developed *shruti gyan*. The humans have discovered laws and developed ways of calculations by which they can acquire a kind of *avadhi gyan* transcending space and time. They can reasonably well estimate what happened in the remote past anywhere in the universe and can well predict the future. The evolution of consciousness thus has been accompanied by evolution of *gyan* to a higher state, ie from *mati* to *shruti* to *avadhi* as can be seen from the species existing at various times in this evolutionary chain. Extrapolating this in to the future would imply that further evolution will lead to higher levels of consciousness and *gyan*, with time ie to *manahparyay* and ultimately to *keval gyan*. There is nothing which remains to be known after one acquires *keval gyan*. And eventually, every one should become a *kevali*, if nature has its way. Although this is only an extrapolation, considering the logic on which science works, this looks inevitable.

2. The fossil record shows that the evolution is accompanied, not only by development of new species, but extinction of some of the old forms of life. Sooner or later, extinction of all and every species will occur and they will be replaced by new species, ie we can say that extinction is the ultimate fate of all species.

3. The higher species may arise not necessarily from the highest existing species but can occur from any level, even much lower. There are instances that a lower

species has given rise, by a quantum jump, to a much higher level (from the point of view of consciousness) of species. This implies that we can not predict what species will evolve to the higher level and when and therefore all forms of life must be considered sacred and need to be preserved for achieving higher level of consciousness. Disappearance of even very 'low' ranking species may delay or derail the process of acquiring higher level by natural selection.

Based on the observation of physical characteristics and their inter relation in several species, Darwin found that they have evolved in different ways over time as a consequence of interaction with the environment and concluded that evolution takes place by natural selection and life is a struggle for existence and survival of the fittest. He missed the underlying trend of evolution of consciousness; the journey of life on earth that has been from a very low level of consciousness in single celled species to the highest level seen currently in humans. As far as we can extrapolate, this trend should continue in the future. This then is the path of nature and it has set itself a goal of raising the level of consciousness to the highest level.

One important point may be noted here regarding the origin and evolution of life. All species are symmetrical and have binary system (two eyes, two arms, two legs etc). All the life on earth therefore probably has the same root. There are three basic type of species on the earth: Archea, Bacteria and Eucarya and it has been speculated that all plant and animal kingdom has originated from them (Fig. 1.2). In essence all of them have a common ancestor. If this is true, all of them may have the same root as can be seen in the phylogenetic tree of life (Fig. 1.2).

There is another fundamental point to be noted in context of Jainism: Jainism postulates that *jiva* and *pudgala* are separate entities, uncreated (without beginning and end), everlasting, coexisting and interacting, influencing each other yet unrelated. While *Jiva* or *atma* is sentient (conscious), incorporeal, immaterial, formless, weightless, colourless, odourless, eternal, matter is corporeal, non-sentient, non-psychical, inert entity. One can not be produced from the other. Modern scientific

thought speculates, but has not been able to prove, that life has originated from matter. The probability that molecules will

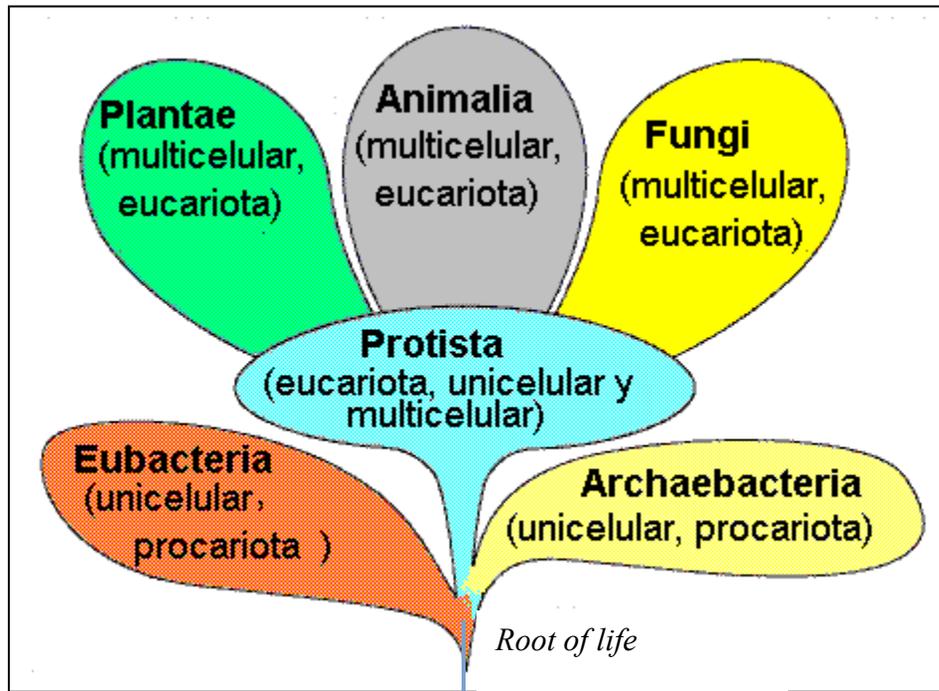


Figure 1.2 : The phylogenetic Tree indicating common root for all plant and animal kingdom on the earth.

assemble in such a way that they will give rise to living species is extremely small, calculated by some scientists to be  $10^{-140}$ . This is too small to result in any organization required even for the simplest species over the lifetime of the universe. Yet scientists have hypothesized, after a long debate, that there may be favourable conditions, architecture, catalysts and templates by which the molecules can get together fast to form complex large organic molecules and then living organisms and search for such routes to life are continuing. This hypothesis got a big boost by the experiment of Miller and Urey. In these experiments in which when an electric discharge was passed in a mixture of simple life-forming molecules like carbon dioxide, ammonia, water and

methane etc , complex large molecules, like amino acids, proteins and similar building blocks of life were formed in a short time. This experiment however has not resulted in a living organism, howsoever simple and primitive. Although science has shown that matter (having mass  $M$ ), which is corporeal and inert, can convert in to energy ( $E$ ) (following the famous law  $E=Mc^2$ , where  $c$  is the velocity of light), which itself is incorporeal and capable of bringing in transformation and vice versa, it has not answered the question that “how does something as unconscious as matter can give rise to something as immaterial as consciousness”. Is life just an aggregation of chemical elements or it is something more? Can assemblage of material components spontaneously produce self conscious ego, aware of itself? In day to day experience we see that only life can give rise to life and it is impossible to produce life from non living matter. We will debate this question further in Chapter 2 but be as it may, let us first consider the universality of the path taken by nature.

Let us begin by debating criteria of a universally acceptable “religion”. In terms of the foregoing discussion, the foremost condition is that a universal religion should preserve all species, enable every one to exist, and treat all, ower as well as higher species, as equals, allow living species to discover their true nature and improve their physical, mental and spiritual well being to enable them to evolve to a higher consciousness state. There are common requirement for accomplishing them, which should be inclusive, and not exclusive, meaning thereby that they should benefit all and not some selected forms of life. The principle for one and all to coexist involves non violence towards each other; for them to discover their true nature involves search for truth; physical well being requires principle of sharing and equidistribution of resources and not amassing wealth by a selected few. These are the principles of non violence, truth, *aparigrah* (minimizing ones requirements) and *achorya* (non stealing) as enunciated in Jainism. We can therefore call Jainism a universal religion. Thus we can see that whether one calls himself a jain or not , most human beings follow these four principles of Jainism. Besides, these four principles, there is the fifth principle of celibacy, introduced by Mahavira in 5<sup>th</sup> century B.C. , a primary requirement for attaining enlightenment which we will discuss later on Chapter 6.

Jainism divides the universe in two distinct parts; living and non-living but gives equal importance to both. Just as physics is the science of the physical universe, Jainism is the science of soul, and more, since it also takes the physical universe into consideration. As any physicists will tell, the universe is governed by certain laws; the laws of physics are universal, applicable at all times and places, can not be violated and there is no scope for miracles. Only when we do not understand a particular phenomena in terms of the laws of physics, we call it a miracle but the moment the phenomena is explained, the miracle ceases to exist. The same is true of living beings. The science of living beings or soul is more complicated but according to Jainism, it also follows certain laws. When we do not understand these laws fully, we invoke God, but moment the phenomena are understood, the need for a “GOD” disappears. Jainism has propounded these laws applicable to living beings, the soul. These laws, Jainism claims, have been enunciated by the Enlightened souls after they realized the state of omniscience through meditation and other techniques.

According to Jainism, there are six cardinal truths (Chapter 2), applicable to *jivas*. The *Ajiva* is made of space, matter (*pudgala*), *dharmastikaya*, *adharmastikaya* and time constituting the physical Universe. Although science agrees with existence of space, time and matter, what *dharmastikaya* and *adharmastikaya* are remains a mystery and will be debated in Chapter 7. These six entities of the universe are eternal, beginningless, indestructible, fixed in number and except matter, others are incorporeal. These eternal entities undergo changes according to laws, are independent of each other, can not influence each other nor can they be influenced by any thing internal or external, nor can they act on their own. Their extent determines the boundaries of the universe (*Loka*).

Jainism has propounded two basic theories or fundamental principles on which our understanding of the universe and universal processes are based. These are : *Anekantvad* (multifacedness) and *Karmavad* (causality). Both are equally applicable to physical as well as the conscious (*Atma* or self) universe. *Anekantvad* describes the true nature of the universe and *Karmavad* describes the basic laws which govern all

the processes in the universe. *Anekantvad* (Chapter 3) implies that the soul has multiple properties, some even contradictory, and all manifest at the same time. It is therefore beyond logic or description. This is the true nature of soul. *Anekantvad* does not consider the physical universe as an illusion as some oriental *dharmas* do but accepts it also as a manifestation of the soul. *Karmavad*, the law applicable to the soul, is equivalent of causality in the physical universe. Every action has a consequence and every effect has an underlying cause. It is the basic law which governs all the processes of *Jiva* (as well as *Ajiva*). It implies that a soul is free to act in any way, ie it is the *karta* but is bound by its consequences and can not escape the consequences of its actions, ie it is also the *bhokta*. The effects can not be mitigated in any way. The fate is therefore choiceless. *Karmavad* (Chapter 4), besides defining the governing laws for self and interaction of self with matter, in its broader perspective, also includes operative aspects ie practices and applications by which one can act in accordance with the law. Because of the practical aspects, it is followed by the Jains rigorously in day to day life. *Anekantvad*, the theory of non-absolutism, on the other hand is abstract and its basic foundations have not been fully developed. This principle, describing the fundamental nature of matter and *jiva* will be discussed in some detail in Chapter 3.

As mentioned above, Jainism is not a religion in the strict sense. Neither it is matter of faith. Nor it is something which ‘God’ has communicated to the earthlings, through his incarnations or through prophets for removing the misery of the people. It is something beyond religion and faith- It is a path: a path for common people for attaining enlightenment described by the Enlightened ones who have realized Enlightenment by their own efforts and not by supernatural powers. It is a difficult path because enormous effort is required to follow it. At the same time it is an easy path because various procedures and landmarks are well defined and the path is clearly charted and one does not have to invent it or depend on some one else to help.

In spite of its originality and antiquity, Jainism is not widely known or accepted. It is actually wrong to call it a “religion” and we have refrained to use the

word religion in the title of this book because in eastern philosophy “*Dharma*” (erroneously considered synonymous with religion) actually implies the “path” or the “true nature” in contrast to the western philosophy where it is equated to religion or faith. Jainism is an atheist faith, giving equal importance to the physical world and spiritual thought. We make an attempt here to interpret its basic tenets in the modern context. The purpose of every living being is to discover its true nature and find and follow the “path” of liberation. Every one has to discover and chart his own path to liberation. It depends on the status of each one on this road to liberation and the best mode to achieve the goal, which depends on individuals personality. The goal of life is certainly not related to the material world or economic prosperity, simply because upon death, which is unavoidable, all the material wealth has to be left here. The material wealth can at most be only a means for achieving higher goals. The only trait which accompanies the soul upon death of physical body is his *karmas* (Chapter 4). Various religion and faith in this context serve only as examples of various paths or procedures followed by some others who have accomplished the goal of liberation but each of these paths may or may not be suitable for every one. One should ponder over them but chart his own path. Lao Tse called it *the Tao* (path). The aim of every path is to know the truth, and if possible, to realize one’s true nature. The fanaticism arises because the practices each religion prescribes for attaining this goal have to be followed with rigor and without compromise, if they have to be effective. If goals of all the religions are the same, they can not be totally exclusive and there should be some commonality between them. One common factor in today’s world, in which everyone has faith, is science. And the methodology of science is truly universal in the sense that any one can study, test and use it. There is no dispute in any one’s mind about scientific theories, be they related to electricity, nuclear physics, chemical combinations or functioning of the body or brain. Therefore it is desirable to make scientific enquiry in to various religions, their basic theories and practices. If some aspects of all religions can be tested and established using scientific methodology, then we can prepare a common ground and live in amity.

This approach, however, is not without objections and flaws. Many learned persons and Gurus consider science and religions to be exclusive and believe that religion is not amenable to scientific scrutiny. In contrast, Jainism claims itself to be based on science and has given importance to scientific study, although here too the opinions may be divided. Jainism has some well developed theories and practices, some being common to Buddhism and Hinduism. We will therefore discuss some aspects of Jainism in terms of Modern physics in Chapter 7.

The corner stones of Jainism is that every human or living being is born with a purpose or goal and there are procedures to achieve the desired goal. Although every one has to discover the purpose of his life and his status in the spiritual domain (*Gunsthan*, Chapter 5) by himself and starting from there, chart his path, the ultimate goal is defined as attainment of enlightenment which is the state of “*moksha*” or “nirvana”. In this respect Jainism is applicable to all who seek enlightenment, an eternal state of omniscience and bliss. Jainism does away with the need of an ‘almighty God’ who creates and controls the universe and leaves the onus of achieving the goal on the person himself. The important point to remember is that life is governed by some laws, which can not be violated and does not depend on favour and fear of an almighty “God” or His whims and fancy. Neither there is need of “God” to help or take the blame. The self is the master of his own destiny. He is neither helpless or a slave but must take responsibility for his own actions.

Jainism is considered as “The eternal religion”. What is eternal in this universe? one may ask. According to the modern scientific view even universe is not eternal. It was born in a Big Bang about 14 billion years ago and it will meet its end in not too distant future. In such a transient universe, only the laws of physics are eternal, physicist believe. They were operative before the universe was born and they will control the fate of the universe, even after it dissolves. In fact the birth of the Universe was a consequence of the laws of physics. Like wise *Karmavad*, the law governing *jiva* is eternal and therefore it is believed that Jainism is eternal.

Any *Dharma*, which claims to be eternal, must therefore be consistent with the laws of physics. What these laws are and how they match with the basic tenets of Jainism, will be discussed in the following chapters but now we turn to the central point of Jainism, the Cardinal Truths in Chapter 2.

## 2

### Cardinal truths (*Shashvat Satya*)

*Appa so paramappa: Bhagvan Mahavir*

*Cardinal Truths, nature of soul  
Powers of soul, Interaction of Jiva and Ajiva  
seven reals,  
Types of Ajiva (Space, matter, Dharmastikaya, Adharmastikay, time)*

Jainism firmly believes that a human being has infinite potential. All the procedures and theories have been propounded to develop this potential fully. The “cardinal truth” on which Jainism has based its theories is the existence of soul. If soul is a myth, then the pyramid of Jainism is without foundation and can not be sustained. One can possibly verify if the soul really exists from its assigned characteristics (nature). Therefore it is necessary to describe its properties. According to Jainism, soul has infinite properties<sup>1</sup>. Jainism takes the approach that every characteristic of *Jiva* or *Ajiva* is a consequence of an inherent power. Therefore, to have infinite characteristics, the soul has to have infinite types of powers. Four amongst them are primary. These are

(i) *Jivatva shakti*: power to exist for ever i.e immortality, it is eternal (*shashvat*) (ii)

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1. Samaysar of Kundakunda describes 47 main properties of the soul. See Hukam Chand Bharill’s book (47 Shaktiyan, Pandit Todarmal sarvodaya trust, Bapunagar, Jaipur).

*Chitti shakti* (consciousness) or “*anant chetanya*”, (iii) *Drishi shakti*: soul is an observer, knower, and (iv) *Sarvagya shakti*; power to know everything (*Anant gyan* or omniscience). Six other equally important characteristics of soul are (v) *anant virya* (infinite energy or omnipotence), (vi) *sarva vyapakatva*, omnipresence (vii) *Anant Ananda* (pure and infinite Bliss), (viii) *Anekatva* (multi facedness), (ix) *Vibhutva*, all properties (*shaktis*) exist at the same time and (x) *sarva darshitva*, *samyag darshan* (faculty to have correct perspective of everything, at once).

It may be pertinent now to ask the question “Does *atma* (soul) really exist? Can it be proved? Is there “something” which have any one or all of these characteristics mentioned above. If so, we can prove the existence of *Atma*. Logically, the existence of soul is proved by the very act of doubting its existence. Questioning the existence of soul presupposes the existence of the knower and it is the soul, or self, which alone has the capability of knowing, doubting and questioning (consciousness), by definition, as mentioned above. Thus the answer to the question is hidden in the question itself. Soul is thus *swatah siddha*, it is self proven. Descarte famously proclaimed “Cogito Ergo sum”, that is “I think therefore I am”. Thought exists because self exists. Who is it who is really asking this question about existence of *Atma*? And who will understand when an answer is given. **That knower is the soul, that is *chaitanya*.** Who will know the knower except the knower himself. “*vigyatarmare ken vijaniyat*”. Therefore Bhagvan Mahavir said You can “know (or see) *atma* by *atma*” What ever I am, I am the *parmatma*. I deserve to be worshipped by myself. The self is endowed with manifestation of consciousness which is two fold, *Darshan* and *gyan*. There is no *jiva* without these two qualities and these two qualities can not exist without *jiva*.

*Atma* can exist in pure (free of bondage) state or in bonded state. In pure state it has the power of infinite *gyan*, *darshan*, *anand* and potency. These four are called “*Anant Chatusthay*”. It is self proven, without beginning (*Anadi*), *Anant* (without end), *amurta* (formless), indestructive (*avinashi*), infinite in expanse (*anant Pradeshi*), indivisible (*akhand*). In addition to these properties, *Atma* also has some “ordinary” properties like it has existence (*astitva*), *dravyatva*, *vastutva*, *Prameyatva*, *aguru-laghutva*, *pradeshatva* etc., some of which have been mentioned above. It is the

knower, can know without sense organs, ie it is supersensuous (*indriyateet*, beyond perception). In pure state *atma* is free (unbounded), *nirpeksha*, *swasrit* (self supporting), *achal* (motion or vibration less), *nisang* (without company, alone) and *gyapak jyotimatra* (*self illuminating*). It does not age, is timeless (*akal*) and so on. The main question is whether Soul is material or non-material. Majority of thinkers believe it to be non-material. Einstein has shown that matter can be converted in to energy and vice versa through his famous equation ( $E=Mc^2$ ). Thus science has no difficulty in converting non corporeal in to corporeal and vice versa. Whatever be the nature of soul, one thing is clear. Because of its power of *Akhandatva* (*akhand*, *abhed*), it can not be further subdivided in to parts, it is the minutest of the minute and *ati-sukshma*. Expressible or not, material or non material, or a form yet unkown, Jain scriptures mention that the soul can interact with subtle material particles (*karmanu*). When it does so, it can undergo vibrations. Now as far as we know, only physical entities can have vibrational modes. Thus in impure (bound) state it has the capability of vibrations.

Several oriental thoughts believe in existence of soul but their views are not identical. It ought to be so because of the property of *Anekatva* (multifacedness) according to *Saptabhangi* (the theory of seven modes of existence) a theory propounded by Jains (to be described later, Chapter 3), some things are indescribable and may exist in multiple forms at the same time. Accordingly we can say, (i) it is material, (ii) it is non-material, (iii) it is material but still not expressible (as material), (iv) it is non-material but still not expressible (as non-material) (v) it is both material and non-material, (vi) none, neither material, nor non-material and (vii) it is non-expressible. This concept agrees with the modern physics concepts of quantum mechanics in which elementary particles, the ultimate constituents of matter may occur as particles or waves or both. *Saptabhangi* has been explained very succinctly by D.S. Kothari in a quantum mechanical way by taking the example of a particle in a box which is divided by a partition with a hole in two compartments (A and B). Because of the particle-wave duality, the particle (say, a photon or electron) can be in compartment A, or in compartment B, In A and still not only in A , In B

and still not only in B, not in A and B but elsewhere outside the box, in A as well as in B and in an indeterminate state (*avyakta*). The same solutions emerge from the considerations of quantum mechanics as has been shown mathematically by taking wave functions. Following these considerations, we may therefore take the view here that the soul may be both, material and non-material or neither or indescribable.

Many qualities are ascribed to *atma* in Jain, Hindu and Buddha scriptures. Buddhism also rests on the existence of soul but The Buddha had even forbidden this question to be raised, because it is indescribable.

In spite of the elaborate discussion given above, the nature of the soul is a highly debatable point. Materialists and spiritualists, each recognizes only one reality. Scientists hypothesise that “living” can emerge out of non-living, whereas some spiritualists believe that all matter is a manifestation of self (*atma*). It is however not clear how either of these claims can be accomplished. To resolve this dilemma, some dualistic theories were proposed. They consider mind and matter or *Purush* and *Prakriti* as two eternal, coexisting, independent, interacting reals. Even if the two way psycho-physical interaction between mind and matter – from mental to physical (as in action of body, commanded by a thought) or from physical to mental (as in perception) occur, how can our abstract, internal thoughts and intentions about action cause the physical motion of our bodies without the presence of **self** everywhere within the whole body and confined to the body, a property ascribed to self, called *niyatpradeshatva shakti*.

According to Jainism, the universe is an interplay between *Jiva* and *Ajiva*. The soul and *karmanu* interact with each other without losing their essential qualities. Jainism is clear that *jiva* can not be converted into *Ajiva* and vice versa, a quality known as “*agurulaghutva*” which maintains them as they are and prohibits conversion from one to another although they can interact and fuse with one another. Jains consider both matter and *jiva* as *asthikaya*. Both are real (sat: “*Utpad- vyaya-*

*dhruvya- yuktam sat*”). Every action by *jiva* results in a psycho-physical entity called *Karman sharira*. In bonded state, it acquires vibration (*spandan yukta*)”.

*Jiva*, like matter, is *asthikya*, but unlike matter that offers resistance to other material particles entering the same space, soul occupies the dimension of the body but does not offer resistance to other souls to enter i.e. does not fill the space. Two or more souls can occupy the same space just like two lamps can illuminate the same area. Thus co-existence and co-presence are qualities of the souls. Of the various qualities of the soul mentioned in Samaysar, one is *Vibhav shakti*: ie power of distortion which makes soul and matter liable to mutual influence. Both soul and matter interact with each other without losing their own essential qualities. This is the primary power under the influence of which *atma* interacts with *karmanu* and both evolve in their own way. This interaction leads to bondage. There is no bondage without interaction between *atma* and *Karmanu* (material particles) and there is no interaction without bondage. There are two types of bondages: *Bhav karma* and *dravya karma*. *Bhav karma* is the transformation of self through itself and *dravya karma* is transformation of self through physical action.

Once the existence of soul and its eternal nature is accepted, four additional cardinal truths of Jainism, making them six in all, can be enunciated as follows.

### **The Truths<sup>2</sup>:**

1. Soul is the *Karta* (doer): soul's indulgence in *Karma*.
2. Soul is *Bhokta* : Soul has to bear the consequence of *Karma*.
3. Existence of *moksha* : The soul can attain pure state, without bondage.
4. Procedure of attaining *Moksha*: There are ways of purifying the soul.

When one believes in the six cardinal truths, mentioned above, one attains correct perception or world view (*Samyag Darshan*), which leads to true knowledge (*Samyag Gyan*) and perfect conduct (*Samyag Charitra*).

The Universe consists of seven (and only seven) reals (*tattvas*). These *tattvas* are : *jiva*, *Ajiva*, *Asrav* (inflow), *bandh* (Stoppage), *Sanwar* (cleansing) , *Nirjara* (detaching) and *Moksha* (liberation). Basically the last five elements are related to interaction (association and dissociation) of *jiva*, the sentient (Soul) with material *karmanus*. *jiva* is an active element, capable of acting on its own (*karta*), having various powers listed above. *Ajiva*, as mentioned before, is considered as an independent element made of five elements of *Dharmastikaya* (considered as medium of motion), *Adharmastikaya* (medium of rest), space, matter and time. These five elements, which are passive (can not act on their own), independent, all pervading, coexisting, indestructible, not capable of influencing each other, according to Jainism constitute the physical universe.

Interaction of soul and matter is the most vital aspect of Jainism. This interaction, both association and dissociation occurs through *karmanus*, the subtle particles of matter. When soul acquires *karma*, a body begins to form. Five layers of bodies manifest for every *jiva*: *karmana* , *taijas* and *audarica* exist normally and *aharaca* and *Vaikriya* exist under specific situations. These are translated, respectively, as *karman* body, energy body, physical body, translocation body and transformation body. As the souls acquires *karmanus*, *karman* body is formed and when the soul sheds all the *karmanus*, it acquires the pure state. The *karman sharira* is receptacle for *karman* matter and changes every moment as the *karmanus* are assimilated or shed. At the time of death, this body accompanies the soul and forms the basis of new body which may be acquired on rebirth. The *taijas* body consists of energy (energy *pudgals*) and helps in metabolism. *Aharaca* body is the conscious body which can come into existence temporarily and while attaining

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2. This discussion is based on *Atmasiddhi* of Srimad Rajchandra (*Drstivad*), according to which there are six cardinal truths: Soul exists, soul is eternal, soul is the *Karta*, soul is the *Bhokta*, *Moksha* exists and there are ways of attaining it.

clarity of the basic philosophy of life and acquires *gyan*. It is kind of consciousness (*chetana*). *Vaikriya* body enables the body to change its form and dimension and thus can bring about transformation of soul to different bodies. *Audarica* body is the physical body of animals and humans as we possess. Thus there are five bodies: karman (causal), tejas (energy), aharaca (conscious), vaikriya (multi-shape) and audarica (physical). They are mentioned here in order of subtle to gross forms.

We have seen in this chapter the basic elements of Jainism and various aspects of interaction between *Jiva* and *Ajiva*. Now we will discuss the basic nature of the universe as described by *Anekantvad* and the basic law of *Karmavad*, which describes the law governing the interactions of soul and matter in the following chapters, before we come to the ways of purifying the soul.

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## 3

# Anekantavad

*One is many and many is one*

*Nature of the universe,  
Macro and micro world,  
Syadvad, Saptabhangi*

Jainism has given a unique concept of nature which is not found in any other thought. It is a deep conceptual doctrine, called *Anekantvad*, stating that the nature is multidimensional, multifaceted, having infinite modes of manifestation, all existing at once ie at the same time. Everything we think, see or imagine is a manifestation of the same ultimate truth, although on the face of it, some facets may even seem mutually contradictory. It is not merely a doctrine but it is also a physical reality, a true and complete description of nature, unlike the sciences which give an incomplete or partial description, depending on what is being observed. It also has application in day to day life for harmony and understanding at personal, societal, national and spiritual levels. Much has been said in praise of *Anekantvad*. Understanding of *Anekantvad* is essential for getting correct world view or *Samyagdarshan*. Samyasar, one of the holiest scriptures of Jains, goes to the extent of saying that one who is equipped with anekant attains *moksha*,

“Any real object in the world is existent and non existent (*sat and asat*), one and many, eternal and non-eternal (*nitya and anitya*), describable and indescribable (*abhilapya and anabhilapya*), neither this nor that, but both ie this as well as that in terms of its nature, time, *pradesh* (space) and material (*swaroop, kal, kshetra, dravya and bhav*)”<sup>1</sup>.

This is how Amritchandra<sup>1</sup> described *Anekantvad*. One may see a thing from any stand point (*naya*) and there are several *nayas* such as *naigam naya* (end use), *samagra naya* (universal or general view), *vyavahar naya* (practical view), *rajasthan naya* (current view), *shabd naya* (synonymous view), *samviruddha naya* (etymological view) and *avambhoot naya* (simily view) etc. When these *naya* propositions or standpoints are formulated in an absolute way (this is it) and are claimed to be absolutely true, they become fallacies. Therefore each standpoint should be considered as only partial truth and is true only in relation to the context.

This theory of *Anekantvad* has been variously described as the theory of many-foldedness, non absolutism, non equivocality and relativism. S. Mookerji calls it multifacedness and the theory of non-one sidedness, implying the many sided nature of reality. Some times *Anekantvad* is contrasted with *Ekantvad* which stands for definite and categorical asserted philosophical position, which as pointed out earlier would be wrong. In the physical world, as in philosophy, things or ideas have plurality of attributes and these can be apparently contradictory or conflicting. *Anekantvad* successfully harmonises or accommodates such views and completes the description of the physical reality.

To understand this principle, let us turn to quantum mechanics. Physics divides the universe in two parts, the macro or gross and the micro or subtle (see Fig.7.1). The laws governing the macro world (galaxies, planets, rocks and whatever can be seen with eye, ie bigger than molecules and atoms) follow the laws of classical physics and the laws governing micro world (molecules, atoms, elementary particles etc that can not be seen with naked eye) are governed by quantum physics. The laws of classical

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1. Amritchandra

and quantum mechanics are very different and will be discussed in some detail in Chapter 7 in a broader context of Jainism and modern physics. Here we confine to a scientific discussion relevant to *Anekantvad*.

We see that gross matter has only a few properties. Anything we see has only two properties : weight and shape. As we go to smaller entities of matter constituting the microworld, like protons or electrons, they exhibit additional properties, like electric charge, wave – particle duality etc. These will be discussed in more detail in Chapter 7. The essence of this discussion is that in the domain of elementary particles, as one goes to finer and finer constituents of matter (from molecules to atoms to protons to quarks and so on), it exhibits more and more attributes (quantum states). It is difficult to perceive all of them at once, although they exist all the time. This is the true nature of reality. It is not possible to comprehend or quantify all these states at once. As we go further to the smallest particle according to Jainism, the *parmanu*, which has not yet been discovered, it may have infinite attributes, impossible to comprehend. This is not a limitation of instrument or technique of measurement , nor it is a limitation of consciousness, but it is due to the inherent nature of things. Complete understanding of a substance requires that we consider each of its attributes to be partly true and all of the attributes have to be considered at once for a complete description.

Let us talk about the principle of Complementarity, a cornerstone of modern physics and *Anekantvad*. The principle of Complementarity, is the most revolutionary and significant concepts of modern physics. Neils Bohr who propounded the basic principles of quantum mechanics had great difficulty explaining it and he used the principle of Complementarity to explain certain behavior in the microworld. For example, it can be experimentally shown that a photon (or electron) sometimes behaves as a compact particle and sometimes as a wave such as a ripple we see in a pond. A photon or an electron, for example, “knows” when it should behave like a particle and when it should behave like a wave. In the famous two slit experiment (see Fig. 7.2), a beam of photon shines through two slits and hits upon a photographic plate behind the slits. The experiment can be run in two ways: one with photon detectors right beside each slit so that the photons can be observed

as they pass through the slits and/ or with the detectors removed, so that the photons can travel unobserved. When the detectors are in use, every photon is observed to pass through one slit or the other. Essentially the photons behave like particles. However, when the photon detectors are removed, a pattern of alternating light and dark spots, produced by interference of light are observed indicating that the photons behave like waves, with individual photon spreading out and surging against both the slits at once. The outcome of the experiment then depends on what the scientists want to measure.

This dual behavior seems contradictory and western thinkers had lot of difficulty in explaining this seemingly contradictory nature of particles. Either it should be a material particle or a wave but can not be both. Bohr explained this behavior by saying that contradictory behaviour is complementary and used the Chinese concept of Yin and Yang, which are both opposite but exist together and are required for complete description.

*Anekantvad* goes a step further. It is not just two type of behavior (particle and wave nature of elementary particles) which needs to be explained but many (*anek*) or even infinite types of behaviour, manifested probably when we go down further to more subtle, smaller constituents of matter. As we have seen in the previous chapter, the soul is indivisible (*akhand*) and hence the minutest of everything that exists in the universe.

*Anekantvad* not only explains seemingly contradictory propositions in daily life, philosophy, microworld, mental perception and in spiritual domain, but it brought in the concept of *Avyakta* or inexpressibility of certain states. Science has been developed on the basis that everything is logical and expressible and does not believe in inexpressibility of any characteristics. Questions which can not be answered in affirmative or negative, like the existence of soul, could be dealt with in the framework of *Anekantvad*. *Anekantvad* is not simply a multiview perception theory. Neither it is a limitation of consciousness that it has limited capability of perception of the physical world but it is the true behavior of nature. Thus it is not looking at an

object from different perspectives but implies that the object can not be known from all the perspectives, at once.

*Syādvād*, a corollary of *Anekantvad*, is a cornerstone of Jainism. Syadvad asserts that all answers are contextual and we may be nearer the truth when we say that this too may be correct. It does not mean uncertainty but makes our understanding as certain and complete as it can be. When we talk of manyfoldedness, the question obviously arises, how many. Certainly more than one but can it be infinite? *Saptabhangi* or sevenfoldedness is a corollary of *syadvad*. Every answer should have seven possibilities. For anything, it is , it is not; it is and yet it is not, it is inexpressible (or indeterminable), its existence is indeterminable, its non existence is indeterminable, its existence as well as non existence is indeterminable are the seven possibilities. This concept is common to Quantum behaviour, which can not always be expressed in language. This has been explained by D.S. Kothari in his essay on "Complementarity principle and Eastern philosophy".

In a nut shell, *Anekantvad* asserts that this is true and that also is true. Contrast it to upanishadik concept of *neti*. When asked what "God" is, the Upanishads, pointing at everything conceivable, says "**Neti , Neti**" **neither this, nor that**. None of the visible objects is God. In contrast *Anekantvad* says **This is true and That also is true**.

Three different doctrines have been proposed in various eastern thoughts: *Adwaitvad* (non-duality), *Dwaitvad* (duality) and *Anekantvad* (infinite possibilities). The universe consists of infinite type of things. The first proposition is that every thing we see has emerged from one. Thus *Adwaitvad* asserts that everything is a manifestation of "One". If in the beginning there was only "One", logically "many" (*anek*) can not originate from "one" (*Ek*) because for anything to happen requires a cause. Without a cause "ONE" would exist as it is for ever. Existence of a cause requires something external of the ONE ( ie at least "two"). Causality requires at least two to interact to give rise to "many", so "many" coming out of "one" violates causality. This proposition rejects "*advaitvad*" (non-duality) and

necessitates “*dwaitvad*”. In this case every thing emerges from the interaction of *Purush* and *Prakriti*. *Anekantvad* goes a step further. It asserts that the “ONE” has infinite attributes and thus one and many are the same. It thus synthesizes *Ekantvad* (adwaitvad), *dwaitvad* in to *Anekantvad*. Thus *Anekantvad* is a true description of the physical reality and is necessary for understanding the nature of ultimate constituents of nature.

## 4

### ***Karmavad (Causality)***

***One who believes in karma can do no wrong and  
can never be unhappy.***

*Types of karma*

*Elimination of Karma:*

*Ashrava (inflow), Bandh (bondage), Samvara (protection), Nirjara (cleansing),  
moksha (emancipation)*

The physical processes occurring in the universe follow the law of causality “Nothing happens without a cause and every action has an effect”. This law of causality in the spiritual domain is *karmavad* of Jains. Every physical action has a physical effect on the body and mind and every mental action (thought) affects the mind and sometimes also the body. Both physical and mental actions affect the soul, but the consequences of *Bhav* (thought or attitude) on the soul is dominant. Every action or thought (physical or mental ) results in bondage of the soul. A person has the freedom to act in any way he likes but has no choice in facing the consequences of that action because he is bound by the law which can not be violated. Good or bad, both actions results in bondage; they can not be annulled by each other ie a good act can not cancel the bad act of equal magnitude but one has to go through the consequences of each of them separately. When the bondages due to each, good as well as bad, *karmas* are completely eliminated, one attains *moksha*. Influence of some types of *karmas* can be made milder by certain techniques and their severity can be reduced whereas there are others, consequences of which have to be experienced in full measure. Liberation from both these types of the binding *karmas* is the goal of the soul. The inevitability

that one has to face the consequences of his actions will refrain one from wrong doing, even in trivial measure, and the concept that “ the unhappy patches in life are a consequences of the past *karmas*, which can not be avoided or erased” will provide him the necessary strength of facing them without suffering.

The stage or *Gunsthan* at which the soul is located depends only on bondage of one’s accumulated *karmas*. Souls take birth at appropriate stage determined by the *karmas* of the previous births. Upon death, the soul leaves the physical body, leaving all the physical objects of desire here on earth but carries with it the *karmas*, past and present.

It immediately follows that no one, not even “God”, if He existed, can help one from going through the consequences of his *karma* or actions.

In this world, one can not exist without acting in some way or the other all the time. So that the key to *moksha* is to act without acquiring *karma*. It does not mean that one should not act but how to act so that there is no bondage? One should act without passion, attachment, expectation, but not without purpose of achieving *moksha*. The path or procedure accomplishing this goal is via *samwar* (stopping to acquire new *karmas*), and *nirjara* (shedding old *karmas*).

*Karmas* have consequences, at physical, mental, and consciousness level and binds the soul to its actions. *Karmas* are cumulative. Surprisingly, they do not fructify instantaneously but there is a period of dormancy before they arise. This explains the apparently different fate for different persons which seems unrelated to their deeds and efforts in the present life. There are infinite types of *Karmas* but they can be classified in a few groups, mainly eight. Of these four are destructive (*Ghati karmas*) and the other four are non-destructive (*Aghati*), as mentioned below, but the soul carries all of them with it at birth. These form two repositories, *sanchit karma* and *arjit karma*. *Sanchit karma* are accumulated over previous lives or past and *Arjit karma* are acquired by present actions. *Karma* can arise when the time is ripe; in the meanwhile it remains dormant, but does not cease to exist. Why the consequence of *karmas* is not instantaneous? Why they remain dormant for variable periods? It is because the

consequences of *karmas* are not allowed to be faced in an **approximate** manner. Therefore one has to wait till the physical conditions or situations are suitable and are precise for *karmas* (*nam karma, gotra karma* etc) to exactly satisfy before the consequences of other *karmas* can fructify? A million combinations are required for the *karmas* to arise so that the consequences could be precise. Science of karma is an exact science. Its fructification then is a statistical phenomena, waiting in search for the right combination. Some times the conditions can be met immediately and suitable results may be quick to follow whereas in other case it may take time for the exact conditions to be met and the consequences may be much delayed.

The various important group of *karmas* are as follows:

1. ***Darshanavarniya*** (perception deluding) *karma*: It blurs the acquisition of correct perception. Once one perceives the existence of soul and the six cardinal truths (chapter 2) and has full faith in laws of *karma*, this delusion ends and one acquires *samyak Darshan*. Understanding *Anekantvad* is essential for attaining *samyak Darshan*.
2. ***Gyanavarniya*** (knowledge deluding) *karma*: It blurs the acquisition of true knowledge. Once one is convinced that the life has the purpose of attaining *Moksha*, search of truth is the only way and all the souls (*jiva*) are entangled, then one follows the path of Ahimsa (non violence) in thought, speech and deed and acquires *manah paryay* and *Keval gyan*. At that stage he acquires *anant gyan*.
3. ***Mohaniya karma***: This *karma* is acquired due to attachment in the worldly possessions and pleasures through *maya* (physical attachment), *krodha* (anger), *mâd* (pride, ego) and *lobha* (greed, possessions). It can be called *charitravarniya karma*, which inhibits just and proper conduct. When one has mastered total detachment and follows the path of total forgiveness to all living beings than this *karma* is eliminated. In practice, *Krodha, Maya, Mâd* and *Lobha* can not be just stopped because mind can not exist in vacuum, and therefore they should be replaced by *Kshama* (Forgiveness), *Saralata* (simplicity), *vinay* (humility) and *santosh* (contentment) respectively. When this is achieved, the soul is free of passions and *mohaniya karma* is eliminated.

4. ***Antaraya karma***: It determines the various obstacles one faces in accomplishing his goals.
5. ***Ayush karma***: It determines the life span in the new incarnation.
6. ***Nama karma***: It determines the personal traits of a *jiva* like body and health.
7. ***Gotra karma***: It determines the yoni (species), family, social status etc in which a *jiva* will be reborn.
8. ***Vedniya karma***: It determines the potential for suffering pain or pleasure. When one has mastered to remain calm and detached, to worldly events then this *karma* is eliminated.

Each of these *karmas* are further sub-divided into many groups, but it will suffice here to say that there are procedures for eliminating various *karmas* as discussed in Chapter 6. Each of these *karmas* are accrued in three ways, by physical action, by thought and by consent (*anumodan*) approving it to be done by others. Therefore one must not only refrain from wrong doing by himself, and not even think of wrong doing but also refrain from approving wrong doing by others.

*Karma*, *Gyan* and *Gunsthans* are intimately related. As the bad *karmas* are shed, one moves to higher spiritual stage and acquires higher level of *Gyan*. We will discuss these aspects in the next chapter.

## 5

# Fourteen steps to Enlightenment

## Spiritual stages of Soul

*See your Atma with your Atma*

*14 Gunsthans*

*Relation between Gunsthan, karma, gyan*

The journey to *moksha* begins from the present state and *moksha* is the final state. This road is marked by 14 milestones, called *Gunsthans*. These 14 stages of elevation to higher levels of consciousness, which are analogues to quantum states of elementary particles in the physical universe, are like rungs of a ladder. Transition from some stages to stages below or above are allowed whereas some transitions are forbidden. The ascendancy depends on following the path of purification, outlined later, in Chapter 6. The final goal is to attain *kevali* (stage 13), after which one becomes a *Siddha* (stage 14). Each stage has a “name”, signifying the quality of attainment which are discussed in great detail in various *Karma granths*.

Before we describe each milestone, it may be appropriate to introduce some important landmarks on this journey to enlightenment, that is the stages 2, 4, 7 and 14, which is the final destination. Briefly, the base line of the ladder or the first stage is *Mithyatva*, where a soul is having wrong perception or a state of total delusion. A person who does not believe in the cardinal truths (existence and purification of Soul), outlined in Chapter 2, is a deluded soul and is at stage 1 and there is no hope for him till he gets the correct perception. Faith in the cardinal truths leads to ascendancy on this ladder of states. Ascendancy to higher states depend on removal of various delusions or *Karma*, discussed in Chapter 4. A *mumuksha* (seeker) strives for the qualities of compassion, tranquility, equanimity, forgiveness, truth, renouncement and detachment, which are ever present in the mind but have to be practiced or followed in action.

The perception related delusion is overcome in the fourth stage when a person gains right perception (*samyakatva*). As the aspirant goes ahead in thought and action (*Gyan* and *Charitra*), the perception gets clearer and thereby the character related delusion also continues to decrease. Eventually the aspirant attains 8<sup>th</sup> stage. Thereafter the progress in overcoming delusion is swift. When the character related delusion is totally overcome one reaches stage 12. The rest of defiling *Karmas* are instantly destroyed and the person attains omniscience, which is designated as stage 13. At this stage, one attains infinite knowledge, infinite perception and infinite bliss etc. Enlightenment arises when the delusion is totally overcome. This does not mean end of the embodiment but at this stage, the person remains indifferent to physical aspects and remains transcendental. When the omniscient ends the current life, it gives up the body and becomes a liberated soul, the *Siddha*.

Within these stages, there can be upward or downward movements. In case of *jiva* this highest energy state is the most stable state from where one does not go to the other lower states in contrast to the physical universe where the lowest energy state (called the ground state) is the most stable (Chapter 7).

Now we discuss each of the fourteen *Gunsthans* in some detail.

### **1. *Mitthyatva***

*Mitthyatva* means untrue or false perception. Right faith means faith in the cardinal truths, ie existence of soul and *Moksha* as mentioned in Chapter 2. A person having wrong faith does not relish the religion of the soul, which requires right faith, right knowledge and right conduct. Therefore there is no hope of salvation for him.

This wrong faith can either be “Inherited” or “Adopted”. The sense of oneness of soul with inanimate objects like physical bodies and worldly belongings is called the inherited wrong faith. In presence of such a belief, a person remains engrossed in worldly pleasures and can not comprehend the true nature of things, leading to “adopted wrong faith”.

### **2. *Sasadan Samyaktva***

A person having the right faith, that is belief in the cardinal truths (i.e. a *samyakdristi*) is in stage 2. After ascending to higher states, for example stage 4, one can sometimes, howsoever briefly, have doubt in the cardinal truths under the

influence of *anantanubandhi* passion, afflicted by wrong faith ( called *Asadan*), and will fall back to the transitory stage 2. From there he may go down to stage 1 or rise to stage 3.

### **3. Misra**

This is a confused state. Even when a person has acquired the right faith, some times he may be hesitant or doubtful about the veracity of the cardinal truths, required in the fruition of *Samyakmitthyatva Prakriti*, is at this *Gunasthan*. *Anantanubandhi* passion is non-existent here.

From this *Gunasthan* a being does not go to higher stages like *Deshvirat* (stage 5) or *Apramatta Sanyat Gunasthan* (stage 7) and does not bother about bondage of age, death and *Marnantik Samudghat*.

### **4. Avirat Samyakdrishhti**

The state of the soul with unwavering right faith (in the six cardinal truths) but devoid of rigorous observance of rules of conduct (i.e., *Anuvirat* and *Mahavirat*) is the fourth stage named *Avirat Samyaktva*.

A person with right faith and observing right conduct, by realizing the true intrinsic nature of soul and with spiritual experience attains the fourth stage. He realises that he is the sentient supreme being and is the knower, the rest of the universe being the “known”, and that he does not have any relationship with the *ajiva* (non-self, e.g his body) entities. The unnatural (worldly) manifestations of the soul are not its true nature; they disappear with the vision of the sentient nature. This vision, following the absence of the *Anantanubandhi* passions, leads to the blissful and detached state of being and the purity of the Soul persists.

This stage is of three kinds : (i) *Aupshamik*, (ii) *Kshayopshamic* and (iii) *Kshayik*. In any of these, he becomes indifferent to the sensual pleasures although he does not observe total *ahimsa*, i.e injury to moving and non moving *jivas*. He does not refrain from the 12 kinds of abstinence. As long as this being follows non-abstinence on account of fruition of *Aprityakhyanavaran* passion, pride, deceit or greed, he stays in this 4<sup>th</sup> stage. .

## **5. *Deshvirat***

The aspirant in the fourth stage further develops the purity of soul by abstaining from killing or injuring moving creatures but he does not abstain from killing or injuring non-moving creatures (e.g vegetables) attains the fifth stage The *Aprityakhyanavaran* passion is eliminated and the experience of true nature of soul is more frequent than in the fourth stage. The soul develops tranquility and higher degree of peace and he becomes indifferent towards non-self entities and develops merits of *Deshvirat*. This is also called *Vratavirat* or *Sanyatasanyat Gunasthan*, for internally he follows real abstinence of the *Sanyamasanyam* stage and follows various *Anuvrats*.

## **6. *Pramatta Sanyat***

The sentient aspirant eliminates twelve passions and attains samyak *Charitra* i.e conducts himself perfectly. This is called the sixth stage of *Pramatta Sanyam Gunasthan*. Still in this stage, there exists *Sanjwalan* passion with usual force and unthoughtful behaviour.

Usually a seeker lives like a *sadhu* in this stage and follows the twenty-eight primary and their associated rules. The feelings of attachment stays in some form although the internal purity is retained and observed. The twenty-eight primary rules to be observed are : Five *Mahavratas*, five *Samities*, six essentials, five sense controls, nakedness, uprooting of hair, non-bathing, sleeping on the earth, not cleaning one's teeth, taking meals in a standing posture, and taking meals once only.

The fifteen unthoughtful behaviours include four types ie unhealthy narration of women, food, nation and guru, four passions of anger, pride, deceit and greed, five senses, sleep and love. These can be multiplied into eighty. Though it attracts impurities, this behaviour does not destroy the real abstinence required of the sixth *Gunasthan*.

Process of thoughts with necessary purity of operation is essential in the sixth stage, while the seventh *Gunasthan* is spontaneous, without the process of thinking. As such the seeker may remain in that stage for very long time and he may oscillate between the sixth and the seventh stages. One noteworthy fact is that the seeker has to first experience the seventh *Gunasthan* even though he later on descends to the sixth.

### **7. Apramatta Sanyat**

The real seeker without the fifteen undesirable behaviours (*Charitra*), mentioned above, attain the *Apramatta Gunasthan*. The twelve passions are extremely subdued, while Sanjwalan passions exists in mild form. The undesirable behavior does not generate any impurities and the primary and secondary rules of conduct lead to this stage of *Apramatta Sanyat*. Knowingly there is no thought process other than meditation of the pure soul and its experiences. This state continues in all the *Gunasthans* ahead. This *Gunasthan* has two kinds (i) *Swasthan Apramatta Sanyat*, (ii) *Satishaya Apramatta Sanyat*.

Those in this stage who do not ascend to the *Kshapak Shreni* or the *Upsham Shreni* and alternate between the *Pramatta* and *Apramatta* states are called *Swasthan Apramatta Sanyat*. The seekers having developed special unity with the self facing the ascendance of the *Shreni* and attaining the purity of *Adhahpravrittakaran* are called *Satishaya Apramatta Sanyat*. When they apply all their spiritual might and develop oneness with the soul, they reach the eighth, ninth, tenth and the twelfth *Gunasthans*, destroying the twenty one *Prakrities* of *Charitra Mohaniya*, after which they definitely obtain omniscience (thirteenth *Gunasthan*). If their effort is not complete, they attain eighth, ninth, tenth and the eleventh *Gunasthans* and subside the twenty-one *prakrities* instead of destroying them.

### **8. Apuravakaran**

The soul attains an unprecedented (*apurva*) state of purity in this *Gunsthans* and continuously retains it. Various souls undergo different types of transformation in this stage, which is somewhat subjective. Souls ascending on the *Upsham Shreni* as well as the *Kshapak Shreni* undergo the same form of transformation.

### **9. Anivrittikaran**

*Anivritti* means similar and *karan* means modifications or transformation. Each soul undergoes the transformation required to attain infinite purity, but the magnitude of modification required may be different for different souls. The soul at this stage by the strength of contemplation subsides the twenty *Prakrities* of *Mohaniya karma* or destroys the twenty *Prakrities* of the *Mohaniya* and the thirteen of the *Namkarma*.

Souls of persons in this *Gunasthan* do not further attract *karmic* matter for future births.

#### **10. Sukshma Sampraya**

In spite of the purity, minor greed still persists, intentionally or unintentionally. The greed of attaining *Moksha* is the most difficult to overcome. Those who have their *sukshma karmas* either subsided or destroyed are said to be in the *Sukshama Sampray Gunasthan*.

#### **11. Upshant Kashay**

The person in this *Gunasthan* has subsided all external and internal passions. Out of the four destructive *karmas*, the *Mohaniya* is in the *Upshayam* state while the other three have the *Kshayopshayam* state. Since the soul has complete detachment with imperfect sentience, this stage is also called *Upshant Kashay Veetrag Chhadmawastha Gunasthan*. On the completion of the duration of this *Gunasthan* or on completion of the age, the soul then falls down to lower *Gunasthans*.

#### **12. Kshina Kashay**

The souls that have annihilated all passions and attained perfect detachment with complete elimination of all the *karmas* occupy this *Gunasthan* named *Kshina Kashay*. Since there is yet some minor imperfection in sentience, though complete detachment has been attained, this *Gunasthan* is called *Kshina Kashay Veetrag Chhadmawastha*. The saints following the perfect conduct in this stage have annihilated the *Mohaniya Karma* altogether and the remaining three destructive *karmas* are at *Kshayopshayama* stage. As soon as these three *karmas* are destroyed, they will attain the thirteenth *Gunasthan*.

#### **13. Sayog Kevali Jin**

The souls have achieved the nine accomplishments (*Kshayik* right faith, conduct, consciousness, perception, charity, gain, *Bhog*, *Upbhog* and vitality) and have become *Kevalies*. Now their sentience does not require senses to observe or light to see. They have become super-sensuous. Since their mind, speech and body is still operating, they are *Sayog* and since they have conquered both the psychic and material *karmas* they are called the *Jins* and their *Gunasthan* is called, *Sayog Kevali Jin*. These same *Kevali Bhagwan* enlighten the path of emancipation by their divine discourses on the path of

liberation of the soul. Influx of *Sata Vedniya karma* due to mental thinking, bodily movement and speech does not convert to bondage due to the complete absence of passions.

#### **14. Ayog kevali Jin**

The *Arahant Bhagwans* in this *Gunasthan* are without any activity of mind, speech and body and have attained omniscience. Therefore, this *Gunasthan* is called *Ayog kevali Jin*. In this stage the *Arahant Bhagwan* destroys all the *Prakrities* of the *Aghati Karmas* (non-destructive *karmas*) and attains *Siddhahood*.

#### ***SiddhaParmeshti***

Those who have journeyed through the fourteen *Gunasthans* of the worldly existence, become bereft of all the eight psychic and the conventional *karmas* (*Chapter4*) and enjoy the state of eternal bliss. They attain the eight great attributes (*Samaykatva, Anant gyan, Anant Darshan, Anant Virya, Sukshamatva, Awagahanatva, Agurulaghutva, and Avayavadhatva*) due to the destruction of all the *karmas*. Being without any psychic, conventional or matter *karmas*, they would not assume new form of life, ie are free from the cycles of birth and death. They are complete in themselves. At this stage, their souls move to the uppermost part of the universe, for it is no more in their nature to move about in any of the ten directions; these blessed souls are called the *Siddhas*.

The essence of describing all these steps in detail is to emphasise that it is important to keep the goal in view and take steps one by one. If one believes in the possibility of enlightenment by this path, one has already taken the first step to step 2. Observing non-violence, searching for truth, giving up stealing and collection of things moves one upto step 4 with several accompanying siddhis. Giving up anger, greed and attachment physically leads one up to step 6 and giving them up in thought moves him further up the ladder. When all wishes, including the wish for enlightenment and *moksha* cease, all actions by deed, mind and thought are abandoned and right faith, conduct, consciousness and perception is attained, one moves up to the highest state of liberation.

We have used several Sanskrit terms in the above discussion without defining them. To explain them would result in digressing from the main theme and the reader is referred to dictionaries<sup>1</sup> where these terms are defined.

The ascendancy of soul to various higher stages can be attained by correct perception together with certain practices. These practices are described in the next chapter.

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1. For example, Jain Paribhasika Shabdakosa published by Jain Vishwa Bharati University, Ladnun, 2009.

## 6

# Procedures for purification of Soul

*Nanassa sarmayaro*

*Knowledge is only meaningful if it can be  
imbibed in charitra*

*Mahavrats, The Essentials, Prayers,*

*Yoga, Tapa, Dhyan, Anuvrats, Gyan, Bhavana, Moksha,*

*Physiological, psychological and spiritual effects*

Having discussed the foundations of Jainism (Cardinal Truths), the theories of true nature of the Universe (*Anekantvad*), the laws operating in the interaction of soul and matter (*Karmavad*) and the various milestones on the path to enlightenment (*Gunsthans*) in the previous chapters, we now come to the most important, operative part of Jainism, the procedures which can lead to *moksha*. Firstly we must realize that any living body is a miracle. It defies many basic laws applicable to the physical universe. Most importantly, it defies the law of entropy (measure of dis-orderliness), according to which the entropy of any physical system should always increase with time. A biological system is the most orderly system in the universe and is capable of further increasing orderliness, by some actions. Erwin Schrödinger in his 1944 book *What is Life?* explains that most physical laws on a large scale are due to chaos on a small scale. He calls this principle "order from disorder". The physicists explain this apparent violation of laws of physics by considering the biological system and its environment together; whereas the entropy of the biological system decreases, that of the physical environment around it with which it interacts increases much more, effectively increasing the net entropy of the whole system. Each cell of the body is in perfect order and the brain with its neural system is the most orderly system. Thus the

biological system is capable of extracting energy from its environment. This energy is infinite and by certain practices, enormous amount of energy can be extracted from the environment by a living being. The scope of this process is enormous and progressive. When we eat food, every cell extracts energy from it; when we breathe, every cell gets purified and energised; Then *Chakras* (Fig.6.2), as will be discussed later, take the body to higher level of energy, making mind more energetic and orderly and reducing its entropy. All Jain practices, in effect, are aimed at reducing the entropy, increasing the orderliness and energising the system, starting with body and then mind and then consciousness. Some of these aspects will be discussed here. This is also the basis of Tantra school of Jainism and Buddhism. We must also note that body has inbuilt amplifiers which can be activated by practice. Physics has postulated an amplification effect known as the “butterfly effect”. The butterfly effect envisages that if a butterfly flutters somewhere, the atmosphere has an enormous amplification effect which can turn it into a hurricane or a gaint storm. The same is true of the biological systems which are capable of amplifying small amount of energy they extract from the environment into an enormous source of energy, by which *kundilini* can be activated.

However, it may also be mentioned that simply understanding the concepts and theories is not enough. Bhagvan Mahavira<sup>1</sup> has said that unless the *gyan* (knowledge) is practiced in conduct (*charitra*), it is of no value. Although *gyan* is essential for guiding a person towards the right path, it is the practice which takes him towards the goal. Therefore it is essential to follow these practices to achieve the final goal of enlightenment. By practicing some of the procedures given here, it is said that one can achieve some *siddhis* but that should not be the aim. One should not be distracted by the attainments of *siddhis*, to avoid bondage with the *Lobha karma*, which will halt further progress. The *siddhis* are actually hurdles in the path of *moksha* and should be ignored, rather than used for material or mental benefits. Bearing this condition in mind, we now turn to various Jain practices.

### ***Mahavrats***

The primary practices are the five *Mahavrats*, or the great vows, essential for every one who wants to move on the path of salvation, to follow. These are *Satya*,

*Ahimsa, Achorya, Aparigrah* and *Brahmacharya*, translated as truth, non-violence, non-stealing, minimizing one's requirements and celibacy, respectively. We discuss them here one by one.

***Satya:***

Truth is the prime requirement for salvation. It should not be just interpreted as speaking the truth. Speaking truth is essential but trivial. The real meaning of this vow is continuous search for truth, which everyone has to search and find for himself. What is one's true nature? What is the ultimate truth (and goal)? Is this the true path? etc. This search is a continuous process. Truth is actually woven in the universe and therefore one should examine everything around to search for truth. Jainism does not, like Shankara, assert that the world is an illusion; rather it urges one to consider it as a reality and observe it to find the ultimate truth. This provides a common ground between science and Jainism. There are two ways of arriving at the truth. It can either be done by negation: it is neither this, nor that, as has been enunciated in the Upanishads or by affirmation, i.e. it is this and also that. *Anekantavad* points to the second approach and claims it to be more positive. Every thing in the universe is the manifestation of the Self. When one realizes this truth, one has understood the whole truth at once.

What are the elements of Truth? This is well known and described as the Cardinal Truths (Chapter 2). Knowing is however not enough; one has to realize them oneself.

To get to the bottom of the true nature of matter, Jainism has proposed a mode of logic based on various standpoints (*nayas*) such as practical mode (*vyavahar naya*) and definitive (*nishchaya*) *naya*. Some allotropes (*pariyays*) may be different from practical point of view but they all ultimately are manifestation of one basic thing. This kind of logic for the physical universe is mostly irrelevant now because physics deals with these problems in a different manner and is able to get to definite nature of matter using different theoretical and experimental approaches.

The Jain principle of *Syadvad*, though states that every attribute is contextual and only partly true (Chapter 3), the uncertainty about complete understanding of the true nature of matter, is the only way to describe the true nature and therefore according to this principle, the most certain statement about nature of things one can make is that no attribute can describe the true nature of things with certainty. This principle can be applied to the constituents of the physical universe as well as to Self. Ignoring this fact is falsehood and falsehood binds one to several types of *karmas*, depending on the motive, but above all, binds to *gyanvarniya karma*.

### **Ahmsa (Non-violence)**

Practicing non violence is primary requirement for attainment of salvation. The physical basis of non violence, based on the evolution of life on Earth, is discussed in chapter 1. As mentioned before (chapter 3), all the souls are entangled with each other. Killing a *jiva* is essentially like killing a part of oneself. Again *ahimsa* should not be reduced to non-killing of living species, because that is not total non-violence; it is only the first step. Non violence is to be practiced at several levels. First by refraining to kill, then stop hurting, by all the three modes, *man*, *vachan* and *karma*, ie by thought, speech and deeds, then feeling and experiencing the pain of others and then feeling and experiencing that the other is actually your own self. When your soul becomes one with other souls, experiences their pain and pleasure, is unhappy at their plight, then only true non violence is practiced. It is said that practicing true non violence to the ultimate extent instantly leads to *manahparaya gyan*.

The first and foremost implication of non violence is vegetarianism. One must not kill just to survive. Neither it is necessary nor it is desirable. How would we humans feel if there was a superior being who kills us to eat. The same feeling, the fear of death and torture, is there in lower animals. It is a misconception that meat is essential for good health. On the contrary refraining from eating meat is good for health, which can be tested by practice. Vegetarianism has many layers of practice: To refrain from killing higher animals for food, then to avoid lower animals (fungus and yeasts) and then to refrain from eating eggs which are potential source of life, then to

avoid killing plants and trees for vegetables, which are also forms of life, as was discovered by jains much before the western world and then to eat only fruits and vegetables which fall down from trees and plants on maturity by themselves and so on.

Following *ahinsa* to its logical extreme changes life style in toto, as will be discussed later. This will include avoiding tramping on microforms of life as one walks for example, on grass, avoiding killing water borne bacteria and breathing slowly to avoid killing of airborne *jivas* etc. From killing one has to transcend to the next level of avoid hurting them and then experiencing oneness with them in pain and pleasure to the ultimate level when one experiences that the self (soul) and any other life is the same.

Violence of thought and action (*Hinsa*) binds one to several serious types of *karmas* but more importantly to the *gyanvarniya* and *darshanvarniya karma*.

### ***Aparigraha and Achorya***

Minimising one's requirement is the prime requirement of realizing the transient nature of worldly possessions. *Aparigraha* and *Achorya* are the two sides of the same coin. One really does not need much to survive and possession is a *bandh*, a kind of hurdle in spiritual progress. Again, *aparigrah* should be practiced at various levels; minimizing one's requirement is only the first step. At a deeper level, when one realizes that all the souls are one, and the whole of the universe is manifestation of the Self, the whole universe belongs to him. It becomes meaningless to possess anything, much less steal it, if the whole universe belongs to one. If one is indulging in stealing, the one thought which should come to mind is that if the same thing is stolen from him, how much hurt will he feel. According to laws of *Karma*, if one steals something from others, the same is bound to happen to him one day or the other. This is reason enough to refrain from stealing. Not for the fear of loss, but the main reason to refrain from excessive possession and stealing is that they bind one very tightly to *mohaniya karma*.

### **Brahmacharya**

Brahmacharya literary means living, behaving and following the routine prescribed by the path of the *Brahma*, ie the universal laws or the *Dharma*. It

covers every aspect of life in action as well as in thought. However, in practice, it is generally equated to celibacy, which is only one important aspect. The argument for observing celibacy is that one requires all the energy at his disposal to attain something as difficult as *Moksha*. *Brahmacharya* should thus be practiced at several levels and in a very broad sense. All activities of mind and body which result in depletion of energy should be avoided and activities which enhance energy at physical, mental and spiritual levels are recommended. Abstinence is only the first of these steps. The desire for sex, in thought and speech also depletes energy and should be avoided or minimised. Whereas continuous and intense concentration is required for attaining *Moksha*, any thought of sexual activities or thought acts as a distraction.

Indulgence in sexual activities not only depletes the much required energy for attaining *moksha*, it binds one to *Mohaniya karma*.

### **The Essentials:**

Once a seeker has decided that the path of the *moksha* is to be pursued, his total attitude towards himself and others changes and practicing the five *Mahavrats* become easy. For a true seeker, apart from the five *Mahavrats* mentioned above, which are to be observed life long, a few daily rituals are prescribed as essentials (*Avashyak*). These rituals include *samayik* and *pratikraman*. *Samayik* is a word derived from *samaya* which means time and its other meaning is equanimity. It is essentially process to be followed to attain equanimity and timelessness. One must sit in a stable, motionless posture and meditate or devote time for *dharma-dhyan*. It entails physical control of body accompanied by mental control, seeking forgiveness for any hurt caused to any living being. It has to be practiced for 48 minutes, a *muhurt* determined from a day of 24 hours divided in 30 parts based on biorhythms.

*Pratikraman* is usually done in the evening, withdrawing your energy inwards from various activities performed during the day and asking for forgiveness for any acts of commission and omission. It is essentially opposite or reverse of *akraman*, meaning attack.

In both these activities seeking *mangal* (well being) of every one and seeking forgiveness from those who have been hurt by your actions are the main objectives. This helps dissolving *gyanavarniya* and *darshanvarniya karmas*.

### **Prayers:**

Prayer connects the self to the cosmic energy. Psychological effects of prayers are immense. It is the first step towards acquiring mental peace and *samyaktva*. They prepare one better to face the worldly situations, specially if they are adverse, with confidence and optimism. Prayers should not be ritualistic and should be performed in the simplest possible way, bearing in mind that the wish to pray itself is prayer. It should however be noted that prayers can not dissolve the *karmas* which one has earned, no matter how intense the prayers are. Even *Arihants* have no powers to absolve one of his past *karmas*, good or bad. All they can do is to show the right path and thus refrain one from acquiring fresh binding *karmas*. One should therefore pray only to get the right direction and for conviction for right action and not for some worldly benefits. Demanding or expecting material or even spiritual benefits by praying to anyone binds one to mohaniya karma and therefore prayer should only be made for purifying the self.

### **Yoga**

*Yoga* literally means union. A system can be strengthened by union with other systems, by addition of other faculties or we can say by the process of *Yoga*. It can be applied in different contexts. For example when body, mind and soul can act in an additive mode, ie in unison, it makes one of the most powerful systems. Even when the process is applied to any one of them, say body, and all the cells of the body work in an additive mode, ie in unison (or resonance), it can become an extremely powerful agent for achieving a goal. Yoga of body cells can be achieved by Tap or *Bhakti*. Like wise when all the neurons in the brain can be joined together or work in unison, the mind can become very powerful. *Yogasanas* can help establish connection between body and mind through nervous system. Some of the asanas recommended for this purpose are *Bhujangasan*, *sarvangasan*, *halasan*, *shavasan* and *padmasan*. *Goduhasan* increases the *virya* and provides energy required for difficult physical, mental and spiritual goals. Various *asans* should be accompanied with *Dhyan*

(meditation) for best results. Cultivating spiritual consciousness requires activation of *Kundalini*, which is the Vagus tenth cranial nerve, lying dormant in the Manipur *chakra*. Meditation in various postures can activate the *Kundalini* by flow of blood and energy. The idea of various *yogasans* is to increase the flow of blood in the corresponding points of various chakras. Thus yoga is the first step to achieve *moksha*.

### *Tapa*

*Tapa* is the practice of austerity or penance. It is the first step towards purifying body and mind. *Tapas* are of two types: external and internal. External *tapas* begin with eating satvik food, fasting at various levels, from eating only once a day to observing fast for one, two, three, eight or ten days and then to a month and beyond. Contrary to the general belief, it is not only possible but quite easy to fast for days together. At physical level, this helps all the cells of the body to unite and act in unison, hunger or want of nourishment being the uniting motivation; on mental level, it unites the brain and body, on consciousness level, it helps one to live worry free and meditate, because food is a distraction in meditation. The other forms of *tapa* are taking salt and oil free food for a day (*Ayambil*) or more (*Oli*) and there are many forms varying from a month to a year of taking meals of a particular type with a particular schedule (*Varshitapa*, *Vardhman tapa* etc). Fasting unto death (Sanlekhana or Santhara) is the extreme *tapa* which completely removes fear of death. For best results, fasting of various types must be accompanied by various practices of meditations. They have physiological effects on various body parameters as well as psychological effects.

Internal *Tapas* (*Abhayantar tapa*) involve *prayaschit* (repentance for bad deeds), *vinay* (humility), *vaiyaavacha* (service to others), *Svadyaya* (self study of scriptures), *Dhyana* (meditation) and *Utsarga* (to give up external activities, ego, bad thoughts) etc.

### *Dhyan*

*Dhyan* is the prime requirement for mental, Spiritual and physical unity of self. It is the least understood of all practices and is made out to be difficult to accomplish, whereas in practice it is very easy. In fact one is meditating all the time, because mind can not stay without thought. It is only necessary to channelize the thinking. What then is *dhyan*? it is certainly not thinking, but beyond mind. Mind has multi

dimensional capability. It can do parallel processing on a seemingly large number of topics. To use the whole capability of mind on one topic is concentration. Channelising this concentration on soul is *Dhyan*. In a nut shell, seeing the *atma* (soul) with the *atma* (soul) is *dhyana*. There are many types of *Dhyans* and innumerable ways of achieving it; some of which are listed in Table 6.2. The fact that it can be achieved in innumerable ways implies that it is easy to accomplish.

Basically *Dhyan* is of four types: *Arta Dhyan*, *Rodra Dhyan*, *Dharma Dhyan* and *Shukla Dhyan*. *Arta Dhyan* is when the mind is engaged in criticizing some thing or somebody and complain about it. Our mind gets so engrossed in this activity that we forget everything, including our self. *Rodra Dhyan* is about cursing some event or somebody whom we think may be responsible for our miseries. When we do not consider ourselves responsible for an unpleasant event, we hold others responsible and blame him. In this activity again we get so engrossed that we forget our goal and even our self. Thus we have seen that it needs no special efforts to get into *Atra* or *Rodra Dhyan*. The mind is engaged in them all the time, with intense feeling and involvement. But these two types of *Dhyans* are energy consuming and lead us away from our objective of moving to higher *Gunsthans*. Nothing is achieved by practicing them, except more misery.

*Dharma Dhyan* is channeling our attention and energy in a positive mode, leading us to accumulation of energy. It is only a matter of channelizing our ability of *Arta* and *Rodra Dhyan* in a positive way to enter into *Dharma Dhyan*. *Shukla Dhyan* is the ultimate goal, when one does not think either ill or well being of others. One's mind becomes totally empty and its energy is not dissipated.

There are, as said earlier, many ways of attaining *Shukla Dhyan*. *Dhyan* can be attained by focusing the mind on breathing, an object (e.g. a statue), a sound, a thought, a sensual object, an image, or soul. Some practical methods proposed for attaining *Dhyan* are listed in Table 6.1 and one has to select one which will suit an individual best. One practice is to let all thoughts, bad and good pass by till they are exhausted. The mind always desires change. When all the ill feelings, leading to *arta* and *rodra Dhyan* are exhausted, the mind itself will turn to *Dharma* or *Shukla Dhyan*. But this

takes time if we are full of bad feelings about others and hold them responsible for our ills, where as the truth is that we are ourselves responsible for our fate. Meditation for long time, by itself, when all thoughts are exhausted will lead one to *Shukla Dhyan*. *Shukla Dhyan* is the primary requirement for achieving *Samadhi*.

We do not discuss these procedures here and the reader is referred to the vast literature available on the subject.

Table 6.1: Methods of meditation

Type of meditation		Type of meditation	
1	Preksha Dhyan	7	Nidra Dhyan
2	Patanjali Dhyan	8	Spand Dhyan
3	Vipassana	9	Yoga Nidra
4	Transcendental Meditation	10	Mantra Dhyan
5	Kayotsarg	11	Swapna dhyan
6	Sahaj Dhyan	12	Mrityu dhyan

### ***Anu-vrats***

The best course is to begin with small steps. These simple and small steps are called *anuvrats* (small vows). The Five main *anuvrats* are as follows:

1. avoiding injury to mobile beings which have two or more senses or desisting from deliberate acts of violence.
2. truthfulness to avoid false statements out of extreme affection or hatred for someone.
3. refraining from taking anything not given.
4. desisting from sexual relationship with any one other than one's spouse .
5. voluntarily minimising the possession of all forms of assets.

These can be supplemented by more *anuvrats* such as confining movement to a limited area, saving the environment from wanton destruction, avoiding sinful acts for

a predetermined short period of time, observing fast, limiting use of consumable and non consumable goods and sharing food etc with others. These small steps will go a long way as one gets benefited in physical, mental and spiritual health and leads to sustainable environment.

In a typical jain home it is prohibited to waste food, water and electricity (and other forms of energy) and people try to minimize hurting the feeling of others, by their deeds, speech and thought. Every year a universal day of forgiveness is observed. After a 8 or 10 day period, called *Paryushan*, of observing various jain rituals (fasting, *maun*, *samayik*, *Pratikraman* etc), to the extent possible to purify their body mind and soul, everyone seeks forgiveness, not only from those with whom they interact but from all the *jivas* of the universe and, at the same time, also forgive them. This mutual act of seeking and granting forgiveness, eliminates several serious *karmas* and bring harmony and peace in the world.

### ***Gyan***

Meditation empties one's mind of undesirable information and when the mind is

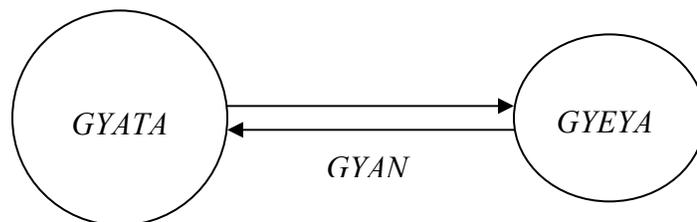


Fig.6.2. The interaction between the knower (*Gyata*), object (*Gyeya*) via knowledge (*gyan*) indicating that an observation modifies both the knower and the object, making it impossible to know their "state" completely by any observation.

empty, true knowledge will spontaneously descend in it. This happens because the nature does not sustain vacuum and absolute vacuum can not exist anywhere. The knowledge already exist within self, but does not appear because it is covered by *gyanvarniya karma*. *Gyan* is pure knowledge, uninfluenced by the subject or the object. Knowledge is usually information and in this context *Gyan* is something more than knowledge as it implies understanding and not just information.

As mentioned before, the universe consists of *jiva* and *ajiva*, the knower and the known. So there are three entities *Gyata*, *Gyaya* and *Gyan* ie the knower, known and knowledge (Fig. 6.2), *Gyata* and *Gyeya* modifying each other by *Gyan*, ie by interaction and transfer of knowledge. Observations influencing the state of an object has been discovered by science and is called the Uncertainty Principle, which states that all the attributes of an object can not be simultaneously determined with precision because the object changes with each measurement as discussed in Chapter 7. The effect on psyche or knowledge of the observer by observing an object is obvious because that is how knowledge is gathered. This is also the physical basis of Darwinian evolution. Evolution takes place in steps (quantum states) when *jiva* interacts with the physical world and modifies itself. Every time *Jiva* observes a physical object or process, its state of mind changes. This also explains how worshipping an inanimate statue of the Lord changes the person. The changes could be to a higher or lower conscious state, depending on the interaction. This is happening all the time, albeit in infinitesimal steps but the cumulative effect over the ages is clear as discussed in chapter 1.

When the distinction between the three of them *Gyata*, *Gyeya* and *Gyan* dissolves, only *gyan* remains and *Gyata* and *Gyeya* disappear. That is the state of pure knowledge. It is said that *gyan* is the body of the *Siddhas*.

Jainism divides *gyan* in five types: *mati gyan* Shruti *gyan*, *avadhi gyan*, *manah paryay gyan* and *keval gyan*. *Mati* and *Shruti gyans* are sensory and *Avadhi*, *Manaha paryay* and *Keval gyan* are extra sensory.

*Mati gyan*; It is the primitive, innate type of *gyan*, one which is born with and acquired by interaction with environment.. Even primitive *jivas*, including single celled species have it in some measure or form.

*Shruti gyan* is the one acquired by interaction with persons or scriptures. This leads to one's evolution and then gradually it becomes part of *mati gyan*. All *jivas* acquire it by interaction but only some higher animals are capable of acquiring high level of *shruti gyan* through teachings of the Guru or scriptures.

*Avadhi gyan* is the knowledge transcending space and time. To a limited extent it is sensory and can be acquired by training of the mind or by acquired *siddhis*. Many scientists can tell about the past and future of various objects, near and far in the universe by using some theories or using some *indriya* (sensory) enhancing instruments of seeing and listening, eg. through telescope, microscope etc. However, to a large extent the *Avadhi gyan* is extra sensory.

*Manah paryay gyan* is entirely a capability of consciousness. When one practices non violence in totality, one can enter or read thoughts of others.

*Keval gyan* (*Keval* implies “only” and *gyan* means knowledge) implying that one loses all identity of body and mind except the knowledge one possesses; a stage of consciousness. This *gyan* is super sensory. It can be acquired, not by sensory organs but by the consciousness. It is a state in which one can see all the *paryays* of all *dravyas*, in time (past, present and future) and space all at once. It is acquired in the state of *Samadhi*. It is Omniscience.

***Attitude (Bhavana):***

The attitude of a person practicing Jainism towards himself, others and the universe changes. He continuously ponders over the basic aspects of Jainism and this is described in 12 attitudes. These can be summarized as follows:

“Oh Soul, Whatever you see around is perishable (*kshan bhangur*), exists by coincidence and is not everlasting (*anitya*). You are absolutely alone (*nitant akela*) and there is no one to protect you (give you *sharan*), There is no happiness (*sukh*) in the

world, every one is indifferent (*paraye*). This body in which you reside is impure, abode of bones, flesh, blood and excreta. It looks alive and beautiful only because of your (*Atmas*) presence in it. Here every one is trying to involve you in sensual

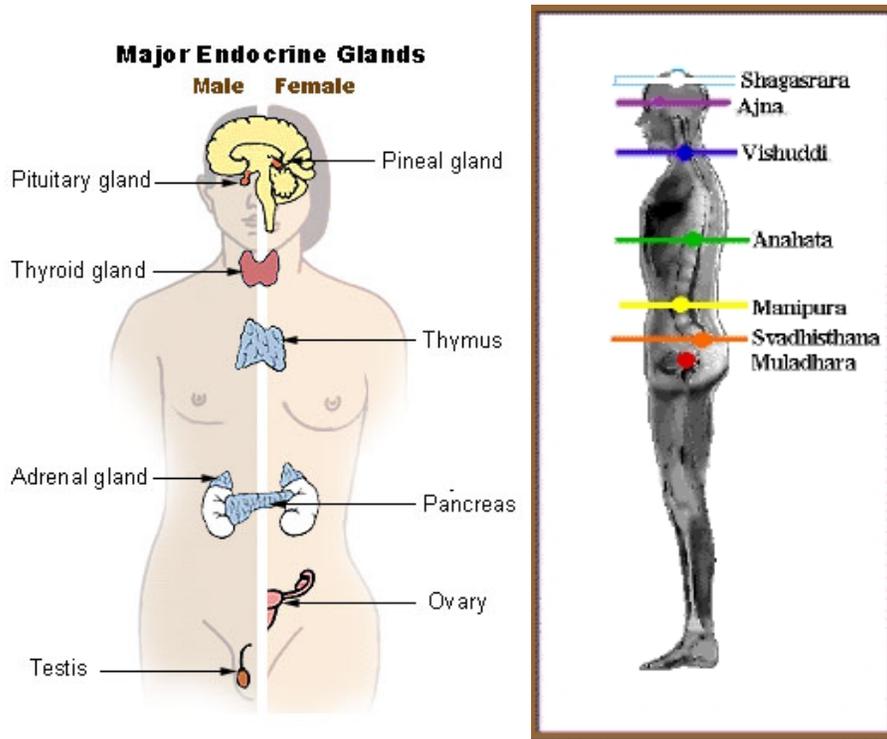


Figure 6.1. Various chakras in the body (right) correspond to various glands (left), which can be activated by practicing various yoogasans.

pleasures, jealousy, attachment and anger (*Raga, dvesh, moha and krodh*). Take all this as false and get totally involved in your own self. By penance free yourself from worldly bondage and by various practices (*japa, Tapa, sheel, sanyam and tyag*) roam in your consciousness and attain the correct perception, true knowledge and perfect behavior (*Samyag darshan, Samyag Gyan, and Samyag Charitra*). Equipped with *Anekant*, moving on the path of *Dharma*, following *Syadvad*, free yourself from all bondages and reside in the *Siddha shila*.

## ***Moksha***

By practicing the Jain path, described above, the self ultimately becomes free of all bondages good and bad, and sheds all the material particles bound to it, even the finest *karmanus*. In this state, the self attains state of unprecedented purity and the highest level of consciousness. In this state the self “perceives” everything past, present and future without the assistance of sensory organs, all at once. The ecstasy of this state can be verily compared to a blind man getting vision. Just for this one reason i.e. to know everything as it is, is compelling enough for one to seek omniscience and follow the path of *moksha*. In this state of omniscience the soul acquires the correct perception and infinite powers. The Self experiences *gyan, anand, chetana and virya* in infinite measure. Having achieved its goal, the soul then does not have to go through the cycles of rebirth, and eternally exists in a permanent state of bliss, at one (upper) edge of the universe (*siddha shila*). The ultimate goal of the universe seems to be separation of *jiva* and *ajiva* in their pure states: the souls moving to *siddha shila* and eternally staying there and the matter remaining in the *Loka*.

## ***Physiological, psychological and spiritual effects of Jain practices***

According to Jainism, a body is a multilayered entity. The various procedures described in the previous chapter like *Tapa*, which mostly include dietary practices, *Dhyan, maun, samayik* etc mainly directed towards shedding of *karma* affects the body, mind and soul at all levels. These effects have been demonstrated convincingly but have not been quantitatively documented. The physiological effects enhance metabolism by activating various chakras (Fig. 6.1) and result in improvement in body parameters like oxygen consumption, blood pressure, diabetes etc; the psychological effects include changes in EEG, better concentration, and capacity to face adverse situations with calm and peace. The spiritual effects include acquisition of several types of *siddhis* and moving to higher *Gunsthans*.

## 7

### *Jainism and modern science*

**Before the universe, there was Dharma (laws)**

**There is nothing universal except the laws of physics.  
Nothing is absolute, neither time, nor space.  
Everything depends on the frame of reference.**

*Scientific basis of Jainism,  
Nature of matter, science sutras,  
Jainism and modern physics*

•  
Science is truly universal, based on certain laws which are non subjective, applicable every where, at all times and acceptable to all. We began this book by claiming that jainism is also universal, based on some eternal laws which are non-subjective and in this respect appears to be quite scientific in its approach. It may therefore be appropriate to look for some common ground between science and Jainism. The purpose of this chapter is to critically examine if such a common ground exists.

Jainism divides the universe in two independent entities, *jiva* and *Ajiva*, the latter being the subject matter of science. The true nature of both *Jiva* and *Ajiva* is multifacedness, with infinite attributes, correctly described by *Anekantvad*, in contextual relation (*Syadvad*) and can be expressed only in seven folded mode of *saptbhangi*. These laws are mentioned in various Jain scriptures (e.g. Bhagvati sutra) but the physical concepts are best summarised in *Tattvartha sutra* of Umaswati, written some 1800 years ago. In particular, Chapter 5 of *Tattvartha sutra* is devoted to physics. We resort to this book for comparing science with Jainism.

As far as physical universe is concerned science asserts that it is governed by certain laws. Science recognizes matter (energy and matter are inter-convertible), three types of forces (gravitation, electroweak (which includes electricity, magnetism and

weak nuclear forces) and strong nuclear forces) and fields, space-time as the elements constituting the physical universe. It is possible that all the forces, both attractive and repulsive, may be manifestation of a single force, but they have not yet been integrated in one as electricity, magnetism and weak nuclear forces, earlier considered to be independent were integrated in one electroweak force. Thus the physical universe, as we understand it now, is made of four components: space, matter (and energy), force fields and time. In comparison, Jainism states that the material universe is composed of five components: space, matter, *Dharmastikaya*, *Adharmastikaya* and time. Thus there is agreement between science and Jainism on the three constituents of the Universe ie matter, space and time. Physics has already shown that there is nothing like medium of motion (earlier postulated as all pervading aether ie equivalent of *Dharmastikaya*) by the experiments conducted by Michelson and Morley and we do not have the faintest idea of what *Adharmastikaya* (medium of rest) could be. This may be a subject of further investigation.

Science has made tremendous progress in the last four hundred years and the behavior of matter is well understood. Physics has divided the matter in two parts, the macro and the micro, where classical physics and quantum physics are applicable. To appreciate this natural division into macro and micro, it may be desirable to briefly go through the historical developments leading to quantum physics and describe the important concepts and basic principles of physics.

### **Science view of macro and the micro world**

The universe is made up of matter which range in size from the smallest invisible entities to the biggest unfathomable entities. The smallest entity known at present are quarks although search for even smaller entities is continuing. The biggest is of course the universe, by definition, but currently scientists are talking of multiverses, which is actually a group of universes. Astronomical observations suggest that our Universe was formed some 14 billion years ago in Big Bang. It consists of some 200 billion galaxies, each of which consists of some 100 billion stars and even more planetary (rocky) objects (Figure 7.1). All the matter in the Universe is made up of several thousands of chemical compounds, several hundreds of minerals and over

a hundred elementary particles. The visible universe with all its diverse components is basically made up of some 118 elements (92 stable and long lived radioactive elements and about 26 short lived elements, synthesized by nuclear reactions in stars, but not naturally occurring now on Earth). The vast tree representing diversity of matter and life in the universe formed out of just a hundred odd elements, acting as the basic bricks compelled philosophers to hypothesise that the root cause of all the elements may be some smaller number of elementary particles, may be even just one. This principle was at the heart of Dalton's atomic theory. The initial search for these building blocks of matter were encouraging and was even taken to support this idea of one basic constituent of all matter and hydrogen was recognized as the atom out of which all the known elements could be formed. As the search for the ultimate constituents of matter continued, three particles, proton, electron and neutron were discovered from which all the 118 elements and their 2000 isotopes could be formed. This trinity could be used in different proportions to build the whole physical universe. This strengthened the belief in *Ekantvad*, ie **one** can give rise to **many** but as further research continued, serious problems arose. By the nineteen sixties, using large high energy accelerators, scientists were able to discover hundreds of elementary particles. Such large number of elementary particles could not be the building blocks for making just a hundred elements and therefore it was postulated that the so called elementary particles should be made up of only a few fundamental entities.

The visible universe (minerals, rocks, planets, stars galaxies etc or the gross world) follows the classical physics. Basically, the state of the gross universe can be determined by summing up the state of all its components. If mass (m), velocity (v) and position (x) of all the components are known, the state of the system can be determined by the proposition that the whole is the sum of parts.

$$\mathbf{Whole} = \Sigma (\mathbf{m, v, x})_{\text{parts}}$$

There are only few attributes of the physical world: mass (and energy) and form (shape), besides change with time. The origin of mass is still not understood. Ernst Mach made an attempt to explain it by what is known after him as Mach's principle. Broadly speaking Mach's principle states that the inertial mass of a body is solely due to interaction of other bodies in the universe. Heller (1975) mentions it in the

following way" The local inertial frames are entirely determined by the distribution and motion of all matter present in the universe" and Einstein formulated it as " the entire inertia of a point mass is the effect of the presence of all other masses, deriving from a kind of interaction from the latter" There is yet no "proof" for this principle but Einstein is said to have derived much inspiration from the Mach's principle in development of his Theory of Relativity.

As we go to the level of molecules and elementary particles, the classical physics fails to hold and quantum physics has to be invoked and some new principles come into play. Thus there is a division between physical laws of classical physics, applicable to the gross universe, roughly bigger than an atom, and the quantum physics applicable to the subtle world, consisting of elementary particles and the micro universe. In classical physics, a proposition that " a particle is at position x" is either true or false. In contrast, in quantum physics, the best that can be said is that if a measurement of position is made, the probability that the particle will be at a position x would lie between 0 to 1. Most concepts of common sense are not valid in quantum world.

### **Quantum Mechanics**

The quantum mechanics puts severe constraints on certainty of our knowledge. Two tenets of quantum mechanics that are relevant here can be crudely described as follows. One is that the universe does not exist if you don't observe it, equivalent to the paradox of the Schrödinger's cat (for popular exposition, see e.g. Gribbin, 1993). This implies that universe and the observer exist as pairs and neither can exist without the other. The other concept is that a particle behaves in different ways at different times. This is clear from the famous two-slit experiment (Fig 7.2) which is the backbone of quantum mechanics and particle-wave duality.

### **Quantum numbers:**

Besides, the normal properties like mass, electrical charge, motion etc, the elementary particles have several other attributes which are denoted by Quantum numbers. These quantum numbers do not change continuously but in steps i.e. in multiples of simple numbers like 1 or 1/2, a concept of the quantum theory. Since we are venturing into the unknown territory of physics, names have been given at the fancy of the

discoverer and should not be interpreted in terms of its literal meaning. Thus spin may not mean spin in the ordinary sense and there are quantum numbers like isospin, and positional (e.g. orbital) quantum numbers. Quarks, leptons and gluons are currently considered to be the basic building blocks out of which all the matter of the physical world is made. Protons, electrons and neutrons are now thought of as being built from six quarks and six leptons. The current particle models due to Gell-mann and others indicate three generations of quarks and leptons. Leptons include electron like particles, sometimes called mesons and the associated mass-less, or low mass neutrinos.

#### First generation

Quarks: down and up quarks

Leptons: electron ( $e$ ) and its neutrino ( $\nu_e$ )

#### Second generation

Quarks: strange and charm quarks

Leptons: mu meson ( $\mu$ ) and its neutrino ( $\nu_\mu$ )

#### Third generation

Quarks: bottom and top quarks

Leptons: Tau ( $\tau$ ) and its neutrino ( $\nu_\tau$ ).

These quarks come in three colours (red, blue and yellow) making them 18 in all. The 18 quarks and the six leptons (and their antiparticles) sum up to 48. Gluons act as their carriers and there are eight of them. To this when we add the carriers of electromagnetic force ie photons,  $W^\pm$  bosons and  $Z^0$ , the total goes to 60. These sixty particles make the whole Universe. To this may be added graviton, the anticipated carrier of gravitational field, not yet discovered.

The six types of quarks are named as up, down, top, bottom, strange and charm. But "up" does not mean up in the colloquial sense, nor "bottom" means bottom but they are just names. All the names mean is that they are different from each other. Like wise they have been given quantum numbers called colour and flavour, which have nothing to do with their literal meaning. Colour actually means a type of force and flavour means another attribute. So when we say a quark has a colour (usually red,

yellow or blue) it simply means they experience a kind of force, called the "strong" force but are different, ie have different attributes. Similarly gluons do have flavour

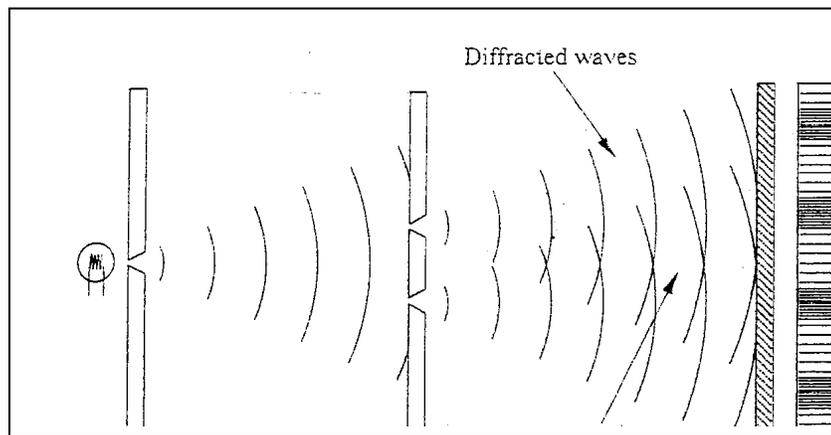
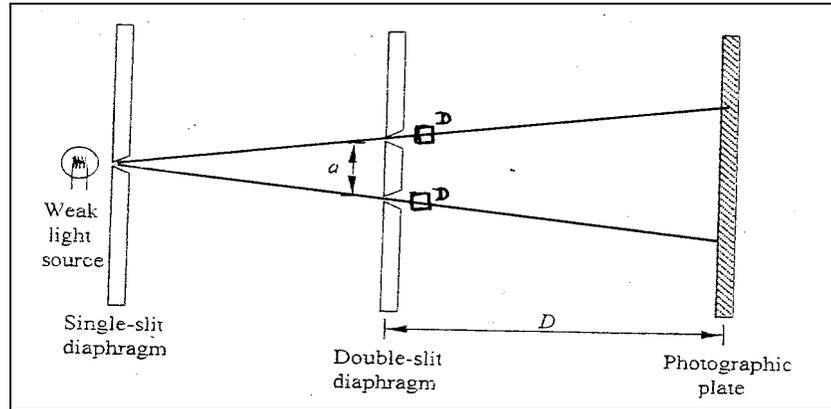


Figure 7.2. The double slit experiment showing that photons (or electrons) act as particles when they are observed by particle detectors (D), giving the characteristic spots on the photographic plate (above) and waves when they go unobserved (below) giving rise to the well known interference pattern due to waves, proving the duality of behaviour of elementary particles.

and different attributes. What these attributes are in the context of common sense is debatable or rather inexpressible. But the main point of this discussion is that as we go

to finer and finer constituents of matter, new attributes come into play and the number of attributes increase. This seemingly agrees with the principle of *Anekantvad*.

Some Quantum phenomena can not be described in a language, they appear "crazy and illogical", and can not be comprehended by common logic. Generally all we can say is that perhaps it is like that, a concept similar to *Syadvad*. Some of these states can not be described and thus seemingly agree with the concept of *Saptabhangi*

New principles were developed to define the behaviour of particles in the microworld. The principle of symmetry and complementarity seem to play some role in the macroworld too but in the micro world, we have, in addition, the Heisenberg's Uncertainty principle, Pauli's Exclusion principle, Entanglement and some others. Before we discuss the quantum behaviour, we will briefly introduce some of these principles which have helped us in understanding the nature of the universe.

1. Principle of Complementarity
2. Principle of symmetry
3. Uncertainty principle
4. exclusion principle
5. Entanglement

#### Principle of Complementarity

The principle of complementarity implies that opposites are complementary and, together they describe the real world. Neils Bohr who propounded the basics of quantum mechanics had great difficulty explaining it, and he did it through the principle of Complementarity, considered to be the most revolutionary and significant concepts of modern physics. The Western philosophers and scientists had a lot of difficulty in understanding and developing quantum mechanics. Some experiments gave contradictory results, implying that sometimes light or a photon (or electron) behaves like a compact object i.e. a particle (like a solid ball) and some times like a wave such as a ripple we see in a pond. In the famous two slit experiment (Figure 7.2), a beam of photon shines through two slits and hits upon a photographic plate behind the slits. The experiment can be run in two ways: one with photon detectors

right beside each slit so that the photons can be observed as they pass through the slits and /or without detectors so that the photons can travel unobserved. When the detectors are in use, every photon is observed to pass through one slit or the other and essentially the photons behave like particles. However, when the photon detectors are removed, a pattern of alternating light and dark spots, produced by interference of light are observed indicating that the photons behave like waves, with individual photon spreading out and surging against both the slits at once (Fig. 7.2). The outcome of the experiment then depends on what the scientists want to measure the property of particles or waves. But how do photons "know" or realize that they are being observed



Coat of Arms chosen by Niels Bohr

Fig. 7.3: Pictorial representation of principle of complementarity, indicating that contrary is complementary, based on Chinese concept of Yin and Yang. This was used as coat of arms by Neils Bohr to describe phenomena in Quantum mechanics.

by the detectors remains a mystery. In the living world, change of behaviour when being watched is a well known psychic phenomena but change of behaviour in the

material world is baffling. Does it mean the particles have a psyche? Scientists don't agree with this interpretation but have explained it on the basis of plurality of attributes.

This dual behaviour of a photon could not be reconciled because of the basic nature of waves and particles were considered to be exclusive or different from each other. Bohr explained this by saying that contradictory behaviour is complementary and used the Chinese concept of Yin and Yang (Fig. 7.3), which are both opposite but exist together and are required for sake of completeness. This is easily understood in the framework of *Anekantvad* (Chapter 3) which accepts that opposites and extremes allow us to learn the true nature of reality. As propounded in Jainism, reality can manifest different attributes at different times. It may be noted that, in contrast, Buddhism avoided extremes and Buddha favoured the path of the Golden mean to reconcile contradictory views. This is a fundamental difference between Jainism and Buddhist approach, but we will not go into this aspect here. Thus complementarity thus became the corner stone of quantum behavior.

### **Principle of Symmetry:**

Nature loves symmetry. Symmetry has been the backbone of understanding nature. The life forms, galaxies, planets, trees, minerals, molecules, atoms etc are all symmetrical. There are many forms of symmetry. Left and right symmetry, mirror symmetry, time symmetry and so on. The conservation laws, on which both classical and quantum physics are based are an outcome of the symmetry principle. Elements (Mendeleev's Periodic Table of elements) are arranged in eight fold symmetry. The 118 elements can be arranged in the form of octets, their properties repeat after every eighth member and so are the elementary particles. In fact, symmetry principle has been used as a powerful tool to predict the existence of many unknown particles by Gellmann, another Nobel Laureate and a profound thinker. He arranged the elementary particles in "eightfold way" and was eventually able to predict and discover quarks, the smallest constituents of matter known to day. It is known now that elementary particles (called hadrons) can be organized in octets (8) and decuplets

(10) whereas leptons in nonets (9). The universe itself is known to be formed by supersymmetry.

Some times a symmetry is also violated. Parity, an attribute of a nucleus, for example, is a mirror symmetry which is found to be violated in certain reactions. Thus existence of symmetry and its violation, both are of fundamental importance in understanding the nature of the basic processes governing the behaviour of fundamental particles.

**Uncertainty principle:**

Applicable mainly to the microworld, the Heisenbergs Uncertainty principle states that it is impossible to completely quantify all the parameters describing the state of a particle precisely. If measurement of some physical quantity is made, then according to quantum physics, the state of the particle is deemed to have changed instantly into a different state. It is not because one can not measure the parameters accurately because of limitations of the instruments or their precision but that the measurement can not be made without changing the state of the particle. For example, both of the parameters in the coupled (conjugate) pairs of energy (E) and time (t), or position (x) and momentum (p) can only be known only within some minimum uncertainty  $\Delta$ : ( $\Delta E \Delta t \geq \hbar$ ;  $\Delta p \Delta x \geq \hbar$ ), defined by the Planck's constant h ( $\hbar = h/2\pi$ ), which is quantum of action and is very small ( $6.625 \times 10^{-34}$  joule.sec.), but none the less, has finite value. Uncertainty principle is one of the fundamental principles applicable to the realm of all the physical microworld. This can also be extended to the realms of consciousness (*jiva*) because consciousness is changing all the time by interaction with matter (fig.6.2).

The transfer of knowledge from the object to the knower changes both the object and the observer. This is precisely what happens according to the Uncertainty principle so that with every measurement, the object changes and it is not possible to determine its state completely. The Uncertainty principle is silent about the knower. How does the measurement of an attribute of a physical object will change the state of the knower (*jiva*) has not been investigated by physics but Jainism asserts that any observation always bring about a change in consciousness.

In a broader perspective, the Uncertainty principle offers a choice, though limited, in behaviour of nature. In the domain of biology, such uncertainty can allow evolutionary changes. The uncertainty in energy levels, e.g., provide a scope for a variance in chemical reactions, leading to different products and thus bring about evolutionary changes.

### **Exclusion Principle:**

The Principle, first enunciated by Pauli states that two elementary particles in the same "state" can not exist at the same place. No body can state it better or more rigorously or elegantly than Kabir, when he, after he gained enlightenment said "When I am there, God is not there and when God is there I don't exist, because the space is too narrow to accommodate both of us (being in the same state).

Now let me ask the question in another way! If I hold "a particular perspective" of a thing or "concept", is it a limitation of my consciousness or it is the way the object reveals it to me. I take the premise that the consciousness has no limitation of comprehension and is capable of conceiving many or all the perspectives at once . It is the object which exhibits different perspectives at different times , in different contexts. In other words multiple perspectives is the inherent quality of an object of the physical world. Thus Anekāntvād is not simply a multiview perception theory but enables us to understand the true nature of reality. It is not a limitation of consciousness that it has limited capability of perception of the physical world . It is not looking at an object from different perspectives but that the object itself exhibits multiple perspectives which can not all be known at the same time, even by the Omniscient kevalis" to describe its "state" completely. Thus , in the physical realm, *Anekāntvād* is as fundamental as the Uncertainty principle, which states that some properties can not be measured accurately, not because of inherent nature of the behaviour in the microworld.

Separately, the various quantum numbers may describe only a part of the reality, but taken together they described the whole. In the microworld, we encounter two other phenomena which have some relevance in the present discussion: confinement and entanglement. The property of "confinement" of quarks in the quark-gluon plasma has been observed. Simply stated, quarks can not be isolated and can not exist in free state

particles, just as the soul is. They remain confined in the gluon plasma like the soul is in the body. It will only be speculative to think of what other attributes will be observed as one goes to further finer and finer constituents of matter of quarks, if there are any.

### **Entanglement**

Entanglement implies that all the particles in the universe, produced in the same process, behave in an inter-related manner. Briefly stated, when two systems of particles, of which we know the states, enter into temporary physical interaction due to known forces between them, and after a time of mutual influence, the systems separate again, then they can no longer be described in the same way as before. By interaction, we may say the quantum states have become entangled. All the particles in the Universe were produced together at the time of Big Bang and therefore they are all entangled in some ways.

Greenstein and Zanjoc in the quantum challenge exemplify another aspect of micro world of atoms. In the gross world, if we hit a ball on a wall within a room having two windows, the ball can go out only through one or the other window. In the quantum world, when an electron, proton or neutron hits a barrier with two or more holes, they can go out of all the holes simultaneously. Notions of causality and of impossibility of being at the several locations simultaneously at the same time are shattered by the quantum theory. This is called the phenomena of superposition of being at two places at once and is related to the phenomena of entanglement. It breaks down our perception of spatial separation.

The quantum mechanics allows us to create the whole universe out of nothing because virtual particle pairs are created out of nothing (vacuum). The whole universe is virtual, an illusion, created out of nothing, as Shankara said and the modern science agrees with it, at least conceptually. In this sense the Universe has been created out of nothing. Yet there are laws that govern the quantum processes and there are principles which can not be violated. It is debatable whether any of these principles which are applicable to subatomic processes are also applicable to the soul, which is infinitely fine and small.

## **Science in a nut shell**

Having pointed out that some of the laws which operate upon the gross universe and the microuniverse are different, and nature follows some principles, we briefly summarise the basic understanding of physics in the following sutras:

1. The processes occurring in the physical universe are deterministic in the sense that they all obey certain laws.
2. These laws are universal, applicable at all places, at all times and govern all processes.
3. The universe can be divided in two parts, the macro (gross) and the micro (fine, sukshma). The laws governing these two regimes are different.
4. The macro world as well as micro world is symmetric in nature in most attributes.
5. The macro (visible to eyes and telescopes, as big as they can get) follows the laws of classical mechanics. The governing law is that the whole is the sum of parts. This is the law of addition of various properties of the gross world, like mass, volume, and parameters of motion etc.
6. In both regimes, mass and energy are inter-convertible given by the simple relation  $E = Mc^2$ , where  $c$  is the velocity of light. Mass can take many forms and so can energy but the sum of mass and energy of a system is always constant known as the “law of conservation”.
7. In any transformation, laws of conservation are obeyed. Energy can never be destroyed or created.
8. Conservation laws are applicable to energy, momentum, charge, symmetry and a large number of other attributes.
9. Time always moves in forward direction. This arrow of time is determined by increase in entropy (disorder).
10. The micro world (molecules and smaller entities i.e. atoms, elementary particles, as small as they can get) is governed by quantum mechanics. Some laws of classical physics are not valid in this regime.
11. In the micro world, new properties (attributes) come in to play. One such attribute is duality i.e. the same particle, such as photon, can behave as matter or wave at

different times. It is possible that as one goes to finer and finer particles, new attributes (called quantum states) will arise.

12. In the micro world, particles exist in certain discrete states. There is no continuous transition from one state to another but any change is a quantum jump.

13. Some of these attributes may be contradictory. Contradictory properties are in fact complementary and enables us to understand the nature of the whole.

14. Processes in the micro world follow certain principles: These are principles of uncertainty, Exclusion principle, entanglement etc.

15. Uncertainty principle requires that some of the attributes of a particle (like position and momentum or energy and time) can not be simultaneously measured with precision. This is not a limitation of the observer or measurement but a fundamental law which prohibits precise measurements of both the parameters in a coupled set.

16. Exclusion principle ensures that two identical particles (identical in all the attributes) can not coexist at the same time at the same place.

17. Entanglement ensures that all the particles produced in the same process influence each other, no matter where they are.

18. The whole universe can be built by 61 “elementary” particles which are basic building blocks of matter. These include four carrier particles (photon, graviton,  $W^\pm$  boson and  $Z^0$ ). Quarks and gluons are the smallest particles known so far to physics.

19. Certain “Forces” operate on any material particle in the universe. There are seven forces in all. Electricity, magnetism and gravitation follow the inverse square law. Nuclear forces are of two types, weak and strong. Electricity, magnetism and weak nuclear forces are manifestation of the same basic force called electro-weak. Thus we are left with three basic forces: Electro-weak, strong and gravitation. These may all possibly be manifestation of a single force resulting in a Grand Unification theory of all the forces of nature.

20. Under the influence of the strong nuclear force, elementary particles combine to form aggregates. They, in turn, combine to form protons, electrons and neutrons, which make atoms and atoms combine to form molecules. Molecules combine under the influence of electromagnetic forces to form compounds and compounds form

minerals. Minerals form rocks and rocks, under the influence of gravitational force, form planets, stars and galaxies (see Chapter 10 for the theory of association and dissociation).

21. Presently the universe is made of 4% matter, 20% dark matter and 74 % dark energy.

22. Space and time form the four dimensional universe but the universe may have more dimensions.

23. Velocity of photons is the highest speed material particles can achieve. This is the basic principle of Special theory of relativity.

24. The universe may be in a steady state or may be oscillating between expansion and contraction. Currently, the universe is expanding.

In summary, the basic constituents of the physical universe are Mass (and Energy), Space and time and the three forces (Electro-weak, gravitation and strong).

We have discussed the major concepts of science and summarized them in this style of sutras so that they can be compared to Jain thinking on these aspects. Tattvarth Sutra devotes chapter 5 to these aspects and therefore we now turn to Jainism and see what is common between the science and Jainism.

Jainism recognizes six (and only six) basic “substances” in the universe ie Jiva, *akash*, *Dharmastikaya*, *Adharmastikaya*, matter and time. All are eternal and inexhaustible. Of these two, Jiva and matter are active, ie capable of interacting, corporeal and mobile, and others (*Akash*, *Dharmastikaya*, *Adharmastikaya* and time are passive or inert, are coexisting, and do not interfere with each other. “Substance” here does not mean “matter” but is taken to mean as basic constituent, reals or “varities<sup>1</sup>” and *Akash* is not considered to be cosmic space but something which provide abode (space) to these “substances”. Substances are subject to modification and can exist in various modes (forms). *Akash*, *Dharmastikaya*, *adharmastikaya* and time by themselves are incorporeal and stationary (motionless). *Akash*, *Dharmastikaya*, *Adharmastikaya* and time determine the extent of the universe (Loka) and the whole universe is filled with them. *Akash*, *Dharmastikaya* and *adharmastikaya* are single entities, homogeneous, isotropic, uniform and indivisible. *Dharmastikaya*, and *Adharmastikaya* have innumerable indivisible units whereas

*Akash* has infinite units but is homogeneous. Parmanus or clusters of matter have corporeal properties like touch, smell, taste and colour.

Science agrees with *Akash*, time and matter being the substance of the universe. But what are the equivalents of *Dharmastikaya* and *Adharmastikaya* is debatable. Instead of calling *Dharmastikaya* as medium of motion, if we consider it as source of motion then, it can be considered as energy. However since matter and energy are the same and interconvertible, this definition does not hold. Matter has form and energy has no form but the contradiction in shloka 5.3 and 5.4 of Tattvarthsutra can be resolved if matter can have form and is also formless, if we consider the interconvertibility of matter and energy.

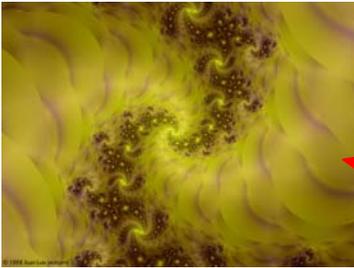
*Nityavasthitany arupani ca* (5.3)

*Rupinah pudgalah* (5.4)

Could *Dharmastikaya* and *adharmastikaya* be kinds of entities from which various forces emerge? Attempting to find agreement between science and Jainism, we may speculate that the three known forces (gravitation, electroweak and strong nuclear) can possibly originate from two entities, one a source of motion and the other resisting motion to fit the description of *Dharmastikaya*, and *adharmastikaya*. Since much effort is being made by scientists to unifying all the forces in one, this speculation can be a subject of further investigation.

There are areas of geography (Jambu dweep etc, Chapter 2 of Tattvarth sutra) and astronomy (Sun, Moon, Universe etc, Surya and Chandra Pragyapti and chapter 3 of Tattvarthsutra) which have major disagreements with our current understanding. The observations as far as geography of the earth and astronomy of solar system and Milky Way etc are concerned are firmly based on remote sensing and telescopic observations. There is no scope of modifying them and therefore the discrepancies existing in scriptures need to be corrected. Some of these aspects are mentioned in Appendix 1.

Universe



Galaxy



Stars



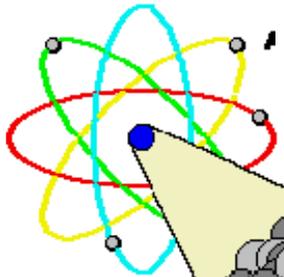
Planets



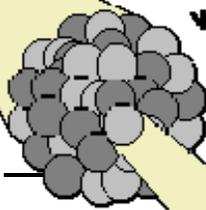
Minerals



Molecules & Atoms ( $10^{-8}$  cm)



Nucleus ( $10^{-12}$  cm)



Nucleons – Protons, Neutrons ( $10^{-13}$  cm)

Quark ( $<10^{-18}$  cm)



**ELEMENTARY PARTICLES**

Leptons	Quarks	$u$	$c$	$t$	$\gamma$
		$d$	$s$	$b$	$g$
		$\nu_e$	$\nu_\mu$	$\nu_\tau$	$Z$
		$e$	$\mu$	$\tau$	$W$
		I II III			
		Three Generations of Matter			

Force Carriers

Fig. 7.1. Macro to the micro universe showing the sequence from the gross to the subtle components of nature. Sixty Elementary Particles (Quarks, Leptons and the Force carriers, together with their antiparticles), known to be the building blocks of matter are arranged in the box on lower right according to their attributes.

Having considered the physical universe from the view point of modern physics as well as Jainism, we now turn to *jiva*. Whether these laws applicable to subatomic particles are applicable to soul, which is infinitely small and fine is not clear. We consider three principles here: *Anekantvad*, Mach's principle and Entanglement

*Anekantvad* is equally applicable to microworld as well as sentient universe. We have already discussed above (as well as I Chapter 3) the similarity of *Anekantvad* and *Syadvad* with quantum mechanical concepts in the domain of physical universe.

### **Mach's Principle and Ahimsa**

Although Newton's laws of gravitation are well formulated and understood, we do not yet know how the inertial mass of a body comes into existence. Ernst Mach gave some idea on this vital question by proposing that the inertial mass of a body is solely due to interaction of other bodies in the universe. The implication of Mach's principle is that inertial mass cannot exist in isolation. Now we may ask if this principle can be extended to *jiva*? We are living in a totally interactive world and everything here is mutually interactive. This is true for life (*jiva*) or soul )consciousness. Life certainly cannot exist in isolation. If all living species, except one, in the universe or even on Earth vanish, the last one also will not be able to survive. Therefore the life is a result of interdependence (or interaction) with other living species. The principle of non-violence immediately follows since the whole becomes a cause for the existence of a part of it and both are indistinguishable. In effect, when, one does any harm or kills some body, howsoever primitive, one is actually killing a part of one self, because his very existence is interactive in nature. It is like committing suicide to a minor extent. Thus the inertial mass, which is a physical entity and the consciousness, which is a spiritual attribute, are both interactive in nature and their origin is a consequence of interaction

with rest of the universe. We will return to this argument at the end when we discuss entanglement.

### ***Parasparopgrah jivanam and entangled souls***

Entanglement is superposition of states of two or more particles, taken as one system. Two particles, which are miles apart or in opposite parts of the universe, behave in a concerted way. What happens to one of them affects the other instantaneously, regardless of the distance. Thus entanglement can transcend space.

We have discussed various aspects of Jainism and modern physics and find that there is some common principles involved in both.

We thus see that by properly amalgamating Jain concepts with concepts of modern physics, it should be possible to ascertain the true nature of reality and make further predictions. *Anekantvad* can be applied to test many predictions of modern science and may have a role to play in making a correct choice between different possibilities. We end this chapter by summarizing these areas of agreement and disagreement.

Jainism divides the universe into *Jiva* (soul) and *Ajiva* (matter) and treats the whole universe as an interplay between the two. It asserts that both are governed by certain laws which are eternal, universal and can not be violated. Science deals with only the matter and asserts that they are governed by laws of physics, which are universal and can not be violated. *Anekantvad* of Jains, applicable to both *jiva* and *Ajiva* can be compared with the principle of complementarity found to hold good for micro particles and is a basic concept in quantum physics. *Anekantvad* in fact goes much beyond complementarity, ie instead of just two aspects, it considers infinite aspects. Jainism divides the universe in knower and the known. Both interact through knowledge, which affects both of them. Physics deals with the knowable objects through observation (knowledge) and asserts that observation modifies the object in some ways. This has led to the principle of Uncertainty, postulated by Heisenberg. In comparison, Jainism asserts that

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1. Nathamal Tantia in “That which is” calls them varities.

knowledge, or measurements modifies both the knower and the known, which of course is true in everyday experience. One of the fundamental aspects of Jainism is *Karmavad*, which is equivalent to Causality in physics; only it is applicable to sentient as well as non sentient, both. This law has led to determinism in physics , that every thing is predetermined, since it follows the laws. This is equivalent to *krambaddha paryay*, a kind of determinism in sentient world. The question of origin of inertial mass in physics led Earnst Mach to postulate that the mass in a body arises because of mass present in the rest of the universe. This is equivalent to the one of the basic principles of Jainism ” *parasparograh Jivanam*, which has been here reinterpreted to mean that life at a place exists because of the presence of life in the rest of the universe.

This sutra can also be considered as equivalent to the principle of entanglement, applicable to souls. These principles immediately lead to the principle of non violence, because if our life depends on others and all the souls are entangled, every life should be protected. Thus we find that there is some common ground between modern science and Jainism. Some of these aspects are listed in Table 7.1.

## Comparison of some concepts



### Jainism

- ❖ Karmavad
- ❖ Krambaddhha paryay
- ❖ Anekantvad
- ❖ Syadvad
- ❖ “*Parasparograh Jivanam*”

### Science

- ❖ Causality
- ❖ Determinism
- ❖ Complementarity
- ❖ Uncertainty
- ❖ Entanglement



Although there are some areas of common and similar understanding between physics and Jainism, there are equally important areas where doubt persists. Jains believe that the universe is eternal whereas science asserts that it originated in a Big Bang. Scientific concepts

are correct to the extent that they are based on observations but may be incomplete and subject to further modifications. Whether the Universe is a Big Bang universe, steady state Universe or oscillating cyclic universe is a point of debate. Some of these aspects are discussed in the next chapter. These can not be considered as a serious disagreements. Science has postulated basic components of the Universe as space, matter (and energy), time, forces and fields. Jainism agree with the first three, ie Space, matter and time but has postulated *Dharmastikaya* and *Adharmastikaya* as the other two components. None the less, Jainism deals with two (or more) kinds of entities which it calls gross and fine, probably just as physics considers that gross follows classical physics and fine matter (microworld) follows quantum physics. Both physics and Jainism believes in some laws of conservation, because Jainism asserts that quantity of the six reals is constant (and eternal) and can not be changed. This is a point of further investigation. Science is working on the hypothesis that life can arise from matter but Jains consider both as independent reals, one can not be produced from the other and both are eternal.

Surely there are areas of serious disagreements between Jain concepts related to geography and astronomy, units of time and space and the modern observations, an area in which science has made tremendous progress and need to be reconciled or corrected. These are discussed in Appendix-1.

## 8

# Jainism, mathematics and Cosmology

*God did not have to create each and everything.*

*All He did was to make laws and everything followed by itself.*

Philosophy, culture and mathematics are intimately related to each other and each of them builds upon the concepts of the other as is well reflected in ancient Indian thought. Jain scriptures mention that the counting system was evolved in ancient times by their first Tirthankar Rishabh Dev. The roots of ancient arithmetic and geometry are documented in the history of Babyloania (going back to 5700 BC), Sumeru (2500 BC), Egypt (4000 BC) and Greece (600 BC) where calendar, weights and measures etc evolved. But formulation of numbers (0 to 9) as we use today and the decimal system was conceived in India. These developments gave a powerful tool to ancient Indian mathematicians in developing several new concepts and in attaining high level of precision in the calculations. The discovery of zero, attributed to thje Indian mathematician Pingal (about 200 BC) and decimal system, more than anything else, has laid the foundation of modern physics, astronomy, cosmology and computers. Some scholars believe that the discovery of zero owes much to the concept of *shunyavad*, an important tenet of Buddhism and Hinduism. Jains were the first to conceive infinity and to recognize that there are many kinds of infinities. Indian mathematicians, specially Jains applied the mathematical concepts of zero, infinity etc not only to to cosmology, astronomy and geography but also to philosophy and culture (e.g. see *Ganit Sar Sangrah* by Mahviracharya, 9<sup>th</sup> century A.D.). For example, infinity was much used in the spiritual domain as some faculties of puren soul are infinite (infinite *Gyan*, infinite *Virya* etc discussed in Chapter 2).

In the ancient times, the concepts of decimal (and the power of 10) systems made it easy to handle large numbers and enabled the mathematicians to comprehend the

vastness of the universe. In many cases they obtained realistic ideas such as in case of dimensions and age of the universe and other large structures like galaxies. However, in the light of the recent progress in sciences and observational techniques, it appears that several ancient deductions related to geography, solar system and planets were erroneous. It is not the purpose of this chapter to go in to the history and priorities in arithmetic and geometry but to discuss some concepts which may still be relevant.

The number system enabled ancient Jains to define vast sets of units of time and space, although they did not use decimal system and preferred some kind of binary or other *ad hoc* systems. Jains divided numbers in to three types, enumerable (countable), innumerable (uncountable, *Asankhyat*) and infinite (*Anant*). Infinity is something which has no boundaries. *Asankhyat* (innumerable) is a unique concept developed in Jainism and defines a number with flexible boundaries. It is strange that some numbers are considered innumerable (*Asankhyat*), because the power system enables one to count any number, howsoever large or small it may be, so that there should be only two types of numbers, countable and infinite, as is currently accepted. Value of *Shirsh Prahelika* determined to be  $10^{250}$ , calculated accurately to 70 digits is mentioned and is probably the largest number we encounter in the Jain scriptures, although we do not know its significance. *Asankhyat* is also used in connection with the unit next to the smallest units (*samay and avalika*) of time which themselves are very small. It is mentioned in *Tatvartha-rajavartika* (5.8) that it is not in the power of even the omniscient to know the *asankhyat* number. We attach deep philosophical and scientific connotation to the innumerable. We take the view that the number of entities can not be counted, only if the entity is continuously changing its properties and is indeterminable. We interpret innumerable as not necessarily a large number but as a number which can not be determined because the number of entity is changing at every instant. Such examples do exist in physics. Due to particle-wave duality, the number of particles in a box can not be precisely counted; only their probability can be estimated. This will imply it to be innumerable or *asankhyat*. Again, this brings us to the Uncertainty Principle discussed in the previous chapter. Heisenberg found that certain parameters (like energy and time ; location and momentum of an elementary particle), both can not be measured with absolute

precision but within an error related to Planck's constant ( $\hbar$ ), not because of the limitations of the instruments but because this uncertainty is the fundamental law of nature. Another example of indeterminate number may be of protons and neutrons in a nucleus. A nucleus is made of protons and neutrons and on the average it is said that a nucleus of, say oxygen, has eight protons and 8 neutrons. However neutrons and protons are continuously changing from one form to another. This is what the Japanese physicist Yukawa found and proposed an exchange meson called pi-meson. So at any instant it is impossible to say exactly how many neutrons and protons are there in the oxygen nucleus. This we consider is the true meaning of innumerable.

Now this innumerable criteria applies here to smallest units of time (*avalika*), only bigger than *Samay* (innumerable *Samay* make one *Avalika* and *Avalika* =  $1.717 \times 10^{-4}$  seconds, according to N.M. Tatia). It is strange that the Jain time units stop at *avalika* and then jump to *Samay*, the smallest unit of time. In comparison, *Avalika* is quite large compared to Planck time ( $10^{-43}$  seconds) used in connection with the Big Bang origin of the universe below which there is some uncertainty in the physical processes occurring there. On the other hand, Innumerable is also used in case of units of large space. If we consider large size of the universe, the universe is finite with volume of 343 cubic Rajjus but a Rajju is made of innumerable Yojans ( $\times 10^{14}$ ) and thus Rajju is indeterminable in absolute sense although according to some scholars its value varies between  $10^{15}$  to  $10^{22}$  km).

### **Cosmology**

Origins, ie origin of life, origin of universe, origin of earth etc are fundamental questions in philosophy, religion as well as in science. We have learnt from science that every physical process is governed by certain laws, which are well defined and can be mathematically formulated with precision. These laws can never be violated. Origin of everything we see in the universe must have followed certain laws. Thus before there was anything, there were laws. Two questions naturally arise as to who made the laws and why are the laws as they are and no different. If there is a 'God' and he made the laws, then the question arises as to who made 'God'? Are there other universes where laws are different from our universe? Take for example law of

gravitation, which says that the force between two bodies decreases as the inverse of square of the distance between them. Why it is square and not cube or any other form, one may ask. The question is not easy to answer, except to say that it is in the nature of things.

To understand the process of origin or essentially who came first, the universe or the laws, three possibilities arise

1. Laws were existing before the Universe originated
2. Laws and Universe (and time) came into existence at the same time.
3. Laws are eternal and so is the Universe: they have existed at all times in the past and will continue for ever. They did not originate.

The first assumption explains that the universe originated following some laws and not in an arbitrary, *ad hoc* or lawless manner and is continuing to evolve according to the same laws. If time and laws are created simultaneously, there was no time before the universe began and the question as to what was before<sup>1</sup> can be avoided. In this assumption, it is implied that the laws are spontaneous, *swayambhoo*, self created. If laws themselves are created spontaneously, then the law of spontaneous creation is one of the basic law. Once it is accepted that the laws can appear spontaneously out of nothing then there is no difficulty in generating everything else also spontaneously. If the universe and laws appeared together, i.e. they are coupled, arguably laws will also evolve as does the Universe. They are linked. Observationally we find that the Universe has evolved over the ages but laws of physics have remained the same. All attempts to see any time variations in laws have so far not been successful. The laws are universal, applicable at all times and places. The third alternative is that the laws are eternal. If laws are eternal, then why not matter (*ajiva*) and *jiva* too are eternal?

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1. The *Nasadiya sutra* ponders over the question of what was there in the beginning, before water, air, light and earth came into existence. Who knows? It says, may be it was the Hiranyagarbha, the primal nucleus.

This is the basis of the steady state concept of the universe. To resolve the problems in the first two assumptions, Jains believe that certain “things” (Jiva, ajiva and other tattvas) are eternal and the universe follows the steady state model. Jiva and Ajiva always existed as they are now. There is no origin or creation. But we know that the Universe, the earth and the life has originated and evolved (see eg. chapter 1) and one day they will also be destroyed. To circumvent this problem Jainism postulates cycles of various types within the steady state. These cycles result in origin, evolution, sustenance and dissolution. Some of the enigmatic points framed above are eternal questions and have not been satisfactorily answered. Whether they will ever be understood remains to be seen.

According to Jains the universe consists of Loka which is finite is immersed in infinite space. Jains have given considerable thought to structure of the universe, its shape, size and units of time and space. Their concept of numbers (a variety of infinities to innumerables to smallest numbers possible) and the precision with which the calculations have been made, comparable to the present day precision, is amazing. It is not however surprising in the land where numerals and decimal system were discovered. Unfortunately there is much confusion in the units of space and time because inconsistencies have crept in the undocumented (memorized) records over several millenia. None the less, the concepts are still preserved and comparison of contemporary astronomical dimensions of the relevant Jain structures may be able to resolve the discrepancies in Jain units of time and space. An added confusion arises because at places Jains use *devgati* (divine velocity) and calculate the dimensions which bear the same name as the common units; For example dev-Yojan and Yojan have been mentioned and used to describe certain aspects of the universe. In spite of these difficulties we make an attempt here to describe and compare the modern and the Jain concepts.

### **Modern Cosmology:**

One of the assumptions on which some of the present theories of cosmology have been developed is that the Universe is isotropic and homogeneous. It is infinite in expanse and it does not change with time, an assumption known as the Perfect Cosmological Principle.

Theoretical calculations showed that a static universe is not possible and therefore dynamic Universe models (expanding, oscillating etc) have been proposed. Before we try to understand the way the Universe originated it is necessary to define what a Universe is. One way of defining it is that it is the totality of space, time, matter and energy. The *jiva* has no place in the modern cosmology although it is considered to be very important in Jain cosmology.

The most acceptable theory for its origin, well supported by precise observations and theoretical calculations is the Big Bang theory but other models are also possible. The Big Bang model shows that the universe started with a big explosion some 14 billion years ago. There was nothing before this time; even the time was born then. According to the models, the Universe has expanded, cooled and evolved in ever increasing steps of time, sequentially controlled by quantum gravity, electroweak and then strong nuclear forces. The initial  $10^{-43}$  seconds, called the Planck time, was epoch of quantum gravity when temperatures were higher than  $10^{32}$  Kelvin. Then it entered Grand Unification epoch which lasted till  $10^{-34}$  seconds. Electroweak forces dominated up to  $10^{-10}$  seconds and were followed by radiation dominated era. Thus in the beginning there was only radiation, which quickly converted into matter as space expanded and time evolved. It took the Universe about 100 seconds after the Big Bang, to enter matter dominated era when fundamental particles were formed. The first to form was quark gluon plasma (see Chapter 7). They quickly froze into protons, neutrons and electrons, which in turn fused into hydrogen, helium and lithium. These particles combined in definite proportions to form matter as it manifests today. As the Universe expanded in space and time the reduction in temperature allowed the formation of structures like clusters. The matter so formed was dominantly Baryonic which is what one sees around today. As matter dominated, the cooling became faster and the radiation got decoupled from matter and the universe became transparent. Inside clusters, individual stars formed due to

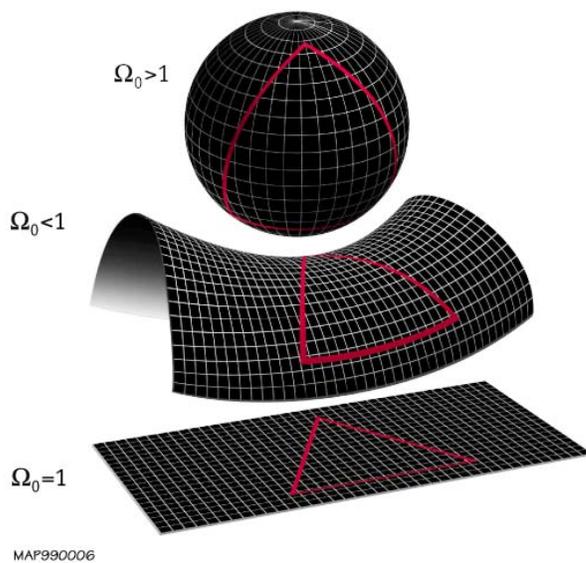
gravitational contraction of Molecular clouds of hydrogen, which by thermonuclear fusion produced all the other elements. As the universe evolved, generations of stars formed, evolved and died resulting in varied objects including the solar system and life as we have, that populate the universe today. The radiation which decoupled from matter around 300,000 years after the big bang cooled and reached the present temperature of around 3<sup>0</sup>K, exhibiting itself in the present era as a nearly isotropic background radiation in the infra red frequency, as discovered in 1964.

One of the major problems in this scenario is that matter and antimatter should form in equal amounts but what we see around is only matter. Where has the antimatter gone? It could form another isolated universe, because matter and antimatter together will annihilate each other.

The universe has been expanding and cooling ever since. In this theory most of the matter was formed in a tiny fraction of a second ( $10^{-35}$  seconds to 3 minutes) since the beginning and evolution is slowing down gradually. The first galaxies started forming in a billion years from the beginning. The theory is primarily based on the observations of Edwin Hubble that all the galaxies are going away from each other. He found that the light becomes redder the farther the galaxy is from us. The shift of light towards red colour occurs when the source is going away faster from the observer. Hubble found that farther a galaxy, faster it is moving away from us. The Universe has been expanding ever since the Big Bang and as mentioned before, the temperature of the initially very hot universe has come down currently to 2.7 Kelvin because of expansion over 14 billion years.

Whereas every one agrees with an expanding universe, there have been competing theories to Big Bang. Hoyle, Bondi, and Narlikar, proposed Steady State cosmology but Hubble's observation of Expanding Universe contradicted it. The expanding universe requires creation of matter to compensate for expansion. To accommodate the Big Bag event within the Steady State theory, Narlikar has modified it to a Quasi Steady State theory, in which the universe is oscillating and the expanding universe is just the current phase which is ultimately going to enter a contraction phase. Then the Big Bang, in this theory is only the last phase of this cyclic Quasi Steady State Universe.

Simply stated, the shape of the universe is determined by competition between the momentum of [expansion](#) and the pull of gravity. The rate of expansion is expressed by the Hubble Constant ( $H_0$ ) while the strength of gravity depends on the density and pressure of the matter in the universe. The fate of the universe is then governed by the density. If the density of the universe is less than the "critical density" which is proportional to the square of the Hubble constant, then the universe will expand forever. If the density of the universe is greater than the "critical density", then gravity will eventually win and the universe will collapse back on itself, the so called "Big Crunch". However, the results of a recent study suggests that the expansion rate of the universe is actually increasing and not slowing down. One way it can happen is if a form of matter exists which applies a strong negative pressure. This form of matter is sometimes referred to as the "dark energy". If dark energy in fact plays a significant role in the evolution of the universe, then in all likelihood the universe will continue to expand forever.



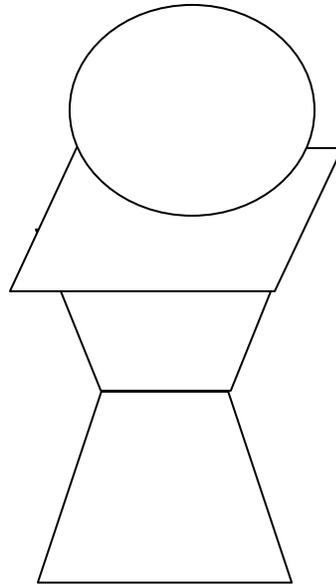


Fig. 8.1 Geometry of the universe, closed ( $\Omega_0 > 1$ ), flat ( $\Omega_0 = 1$ ) and open ( $\Omega_0 < 1$ ).

The density of the universe also determines its geometry. If the density of the universe exceeds the critical density ( $\Omega_0$ ), then the geometry of space is closed and positively curved like the surface of a sphere. If the density of the universe is less than the critical density, then the geometry of space is open, negatively curved like the surface of a saddle. If the density of the universe exactly equals the critical density, then the geometry of the universe is flat like a sheet of paper. Thus, there is a direct link between the geometry of the universe and its fate.

Recently the temperature of the Universe has been measured using space crafts. The observed density of the universe based on the fluctuations of the microwave temperature is found to be close to the critical density, and therefore it appears that the geometry of the universe is flat. We may note that the observations, however, have a small (2%) error.

Two things are clear from the observational astronomy. Firstly, everything in the universe is rotating, around its axis and around the centre of the system, be it planets, galaxy or any other object. Secondly everything in the universe is expanding and contracting, in howsoever miniscule manner (akin to breathing), be it the sun, earth, or

stars. When we discuss Jain cosmology these two points must be borne in mind because these features are not explicitly mentioned in the scriptures.

### **Jain Cosmology:**

Jains divide the universe in two parts Loka and Aloka. Loka, the visible universe is finite, defined by the existence of the six reals, Jiva, matter, akash, dharma, adharma and kal (chapter 7). Beyond the Loka is Aloka, the invisible universe, which has infinite expanse.

Jain cosmology is a Steady State cosmology. It assumes that the universe has been always like this, without beginning and without end. The Jain concept of a steady state-Oscillating Universe is as follows.

The shape of the Jain universe (Loka) is very peculiar (Fig 8.2). This kind of structure is surely not stable unless it rotates around its vertical axis. But rotation can be inferred with respect to a coordinate system. If the coordinate system rotates with the Universe, we will not notice it. Also, sharp edges and corners are also not permitted in large structures by physics. Then an agreement between modern and Jain concepts can be obtained if the universe is a triplet with density greater, equal to and less than the critical density, superimposed on each other as proposed by N.L. Kachhara. In such a case, a spherical, flat and a universe with negative curvature can exist together, side by side or even overlapping each other. The Loka, which is our Universe, is a flat Universe acting as an interface between the Universe with negative curvature (called Hell by Jains) and the close spherical Universe is the sphere on top (called *Devaloka* by Jains).

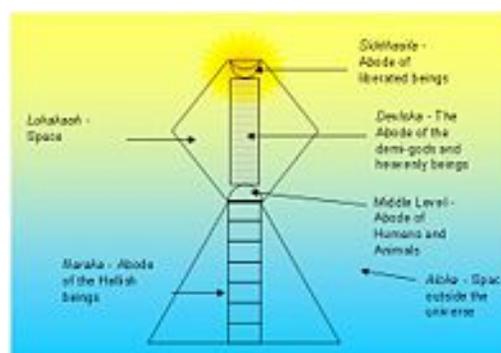


Fig. 8.2: Jain Universe

Alternatively, knowing very well that angular shapes are not permitted in natural processes by laws of physics, the shape more looks like a projection of a four (or more) dimensional object on a 3 dimensional space on which we can draw (see, eg Gurdieff). Some of the modern theories suggest that the Universe may have 11 dimensions.

Jain Cosmology is basically a cyclic cosmology called the Jain wheel of time. It postulates several cycles operating within a cycle. One complete cycle is divided in to two parts, *Utsarpani* and *Avsarpani*. Each of these have a period of 10 *Koda kodi*, the exact equivalent in years is controversial, but it is very large, and some estimates indicate that 1 KK is equal to  $10^{14}$  years, which appears absurd because the age of the universe is only  $14 \times 10^9$  years. Each of these *Utsarpani* and *Avsarpani* are further divided in to 6 cycles, called 'Ara'. The period of 1<sup>st</sup> cycle is 4 KK, 2<sup>nd</sup> is 3 KK, 3<sup>rd</sup> is 2 KK, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> together is 1 KK. The 5<sup>th</sup> and 6<sup>th</sup> cycles are equal to 21000 years each which agrees with one of the Milankovitch solar insolation climatic cycles, as discussed below.

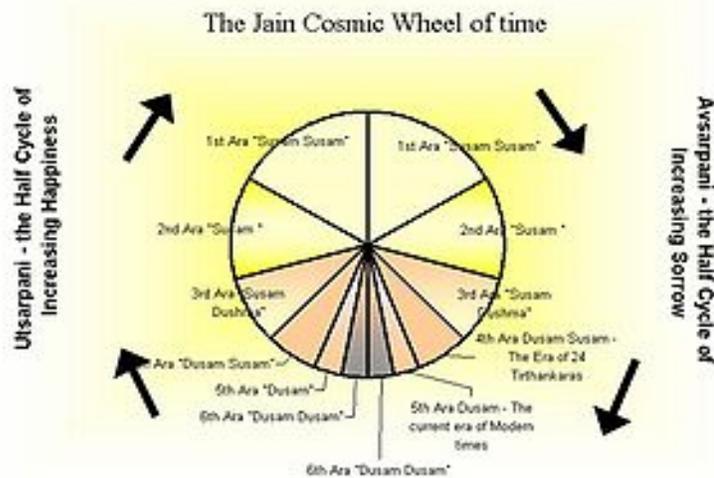


Fig 8.3 Jain periodicities

Modern cosmology also finds that cycles on various time scales are operative. If we consider cycles which affect life on the earth, then there are cycles which can be classified as climatic cycles, geological cycles and astronomical cycles with increasing period. Considering only the important ones, there is diurnal cycle, monthly lunar cycle and annual solar cycle. The climate of the earth depends on solar irradiance received by the Earth. Milankovitch found that the solar irradiance depends on three cycles, the precession of equinoxes (which changes inclination of the spin axis of the earth) with a period of 21000 years (19 and 23 thousand years respectively when, at aphelion, the northern hemisphere is tilted away from the sun and towards the sun), obliquity of the earth, which again depends on the inclination of earth's axis to the ecliptic (the plane in which earth moves around the sun in its orbit) which changes with 41000 years period and change of eccentricity of the earth's orbit (which changes the distance of earth from the sun) which varies with a period of 100,000 years. All these cycles have been experimentally confirmed by climate markers (isotopic fractionation records) preserved in the deep sea sediments. It is difficult to say if the jain cycles are climatic cycles, because their names are related to "happiness and unhappiness" and it may just be a coincidence that the two of the Milankovitch cycles agree with the period of 5<sup>th</sup> and 6<sup>th</sup> *Ara*. The 100,000 year climatic cycle, however, does not match with the period of 3<sup>rd</sup> *Ara*, which has unusually large period, again raising doubt about the units of time. None the less this can be a subject of further investigation.

An important geological cycle (of probably volcanic periodicity) is 33 million years. The sun moves in the galaxy like a carousel. Astronomical cycles include motion of sun in and out of the galactic plane which is about 60 million years and rotation of sun around the galaxy which is about 250 million years. The sun itself has an expected life expectancy of about 10 billion years and we are about half way through its life cycle. The Universe was formed about 14 billion years ago and we know reasonably well how it evolved since then. However not much is known about what happened before the Big Bang and what will happen in the future. The future of the universe however depends on the model used.

We may summarise the discussion in this chapter by stating that modern cosmology is firmly based on observations and theories and Jain cosmology has many appealing concepts. There is scope of reconciling some aspects of Jain cosmology with modern theories. No doubt there are many points of debate, disagreements and dispute, but this itself is a reason enough for further investigations.

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For units of space and time, See for example books by Nath Mal Tatiya or Muni Kanak Nandiji.

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# 10

## Theory of association and dissociation

**Everything in the universe is a result of association and dissociation**

The Universe is a consequence of association and dissociation. Processes of association and dissociation is central to Jainism. The association of soul with *Karmanu* leads the soul to various *yonis* and dissociation leads to *moksha* which is the ultimate goal of all living beings. In the material world, as we know from physics, the association and dissociation occur at various levels. According to physics, there are two types of entities in the universe: matter and radiation. They interact and form all the aggregates that we see. Matter can be converted into energy and vice versa. Matter may exist in forms which are massless or with mass. Those at elementary particle level, for example, in quark-gluon plasma, the ultimate particles constituting the Universe and between protons, electron and neutrons, these processes of combination and disintegration are governed by nuclear forces, ie strong interactions. These are dealt under the domain of physics. At atom and molecular level, ie formation of compounds and minerals, these processes occur electrically and these electromagnetic associations and dissociations come under the realm of chemistry. The modern chemistry postulates various types of electric bonds, depending on the nature of the elements and takes their valency into consideration. The combinations of simple carbon molecules can lead to large complex molecules. It is also believed that these molecules can ultimately lead to formation of biomolecules and simple living cells. These then undergo Darwinian evolution, by interaction with the environment. Thus the modern science postulates the formation of living from non-living, but they have not been able to demonstrate that this actually can happen and this remains as a hypothesis. This postulate does not require the existence of soul.

As far as physical matter is concerned, at the level of large masses, gravitation comes in to play and planets, galaxies and to the largest structure including the whole universe these processes are mostly governed by gravitational forces.

According to Jainism, body has a multilayered structure; the physical body is the gross form and the *karman* body is the subtlest form, as mentioned in chapter 5. The various *varganas* should be able to form the five types of bodies, *Karman* (causal), *Tejas* (energy), *Aharaca* (conscious), *Vaikriya* (form) and *Audarica* (physical) bodies. These five bodies are formed by five types of aggregates, known after their names: ie *karman vargana*, *tejas vargana*, *aharaca vargana*, *vaikriya vargana* and *audarica vargana*. Besides these five *varganas*, three other important *varganas* are *manovargana* (mind *vargana*: for formation of mind), *swachosvas* (breathing *vargana*) and *bhasha* (speech *vargana*).

The Jain universe consists of *jiva* and *ajiva*. The matter and soul as separate and distinct entities, neither forming from the other, but interacting with each other none the less. Jainism postulates 23 types of main *varganas* (associations or aggregates). As the combination proceeds, aggregates of matter are formed and when they exceed a critical mass, qualities of consciousness, mind and speech can be acquired by interaction with their *varganas* (*aharac*, *mano* and *bhasha*). Thus the Jain theory of *vargana* is a step wise advancement for acquiring various qualities, we see in *ajiva* and *jiva*.

Paramanus, the ultimate constituent of matter, form clusters known as *varganas*. The *varganas* are classified according to the number of paramanus in the cluster which generally is large, in the range of infinity. Although *varganas* could be of many types, 23 main types are distinguished. The 23 *varganas* are as follows:

1. Anu *vargana*
2. *sankhyatanu* (numerable) *vargana*
3. *Asankhyatanu* (innumerable) *vargana*
4. *Anantanu* (infinite) *vargana*
5. *Ahara vargana* (for *audarik* (gross), *vaikriac* (fluid) and *aharac* (transitory) bodies)

6. Agrahya (non usable) vargana
7. Tejas vargana ( for Tejas body)
8. Agrahay ( non associable) vargana
9. Bhasha vargana
10. Agrahay ( non associable) vargana
11. Mano vargana
12. Agrahay ( non associable) vargana
13. Karmana vargana
14. Dhruva (permanent) vargana
15. Santer niranter (discontinuous-permanent ) vargana
16. Dhruv sunya vargana
17. Pratyek sharir vargana, used for making immobile life forms (plants)
18. Dhruv sunya vargana
19. Badar nigodh vargana
20. Dhruv sunya vargana
21. Sukshma nigodh vargana: *Audarik, tejas & karman* bodies of *sukshma nigodh jiva*
22. Dhruv sunya vargana
23. Mahaskandh vargana: all visible matter is made of this *vargana*.

It is further mentioned in the scriptures that varganas 1 to 14 are permanent, continuous and mass less varganas and have four attributes (like touch, smell, taste and colour); The mass less varganas have energetic associations and have specific functions such as in constructing the invisible bodies of organisms and supporting other life functions. 15 to 23 have mass, are dense; 5<sup>th</sup> to 14<sup>th</sup> varganas are formed by combination of lower varganas or dissociation of higher varganas. The interconvertibility of 15<sup>th</sup> to 23<sup>rd</sup> varganas is difficult. In view of convertibility of mass and energy ( $E=Mc^2$ ), it does not make much sense in talking about massless but energetic particles. In any case modern physics measures mass of particles in terms of energy (rest mass of proton is 938 MeV). The remaining types of varganas deal with particles with mass where the parmanus are bonded by their electric charge. Some of

these varganas are described as *sunya vargana*, probably implying dissociation. The last 23rd type of vargana is supposed to constitute all the matter present in the cosmos.

Their theory of combination deals with the interaction of soul with soul, soul with matter, and matter with matter and thus is wider in scope. These aggregates are called Varganas. Jainism postulates that all the aggregates we see can be classified into 23 types of varganas.

Now we discuss each vargana separately. The above summary is not consistent with the following discussion but may be more logical.

The smallest material entity is parmanu. It is extremely small, can not be further subdivided, occupies one “unit” of space and possesses high energy. Clusters of Paramanus, containing a very large (innumerable) number of parmanus, form atoms known as anu varganas. Thus according to Jainism, an atom is made of innumerable parmanus. On comparing with what we understand by modern physics, these anu vargana must be governed by nuclear forces. The second category consists of skandha or composite bodies, which contain two to innumerable anus. This may be compared with molecules and compounds, which may have two (as in inorganic molecules ie O<sub>2</sub>, N<sub>2</sub>, CO<sub>2</sub> etc) to innumerable atoms (as in organic molecules of proteins to aminoacids, sugars etc). These combinations must be governed by electric forces (valencies, bonds). The third category is composite bodies, made of innumerable atoms. These may be compared to minerals, which are made of innumerable molecules. When infinite atoms unite then large structures (planetary bodies, stars, galaxies etc) are formed, which come under the fourth category, probably controlled by gravity. These four varganas can form the whole universe (minus jiva), and this is a progressive theory of association from the smallest *parmanu*, to molecules, minerals and structures where the four forces of nature ie strong (nuclear), electromagnetic and gravity comes into play. But to form jiva, with consciousness, speech, breathing etc, more interactions are required. The above four categories are incapable of being attracted, assimilated and transformed by psychic forces. To provide them with psychic attributes, *aharaca vargana* (5<sup>th</sup> vargana) is required and this results in

*aharaca* (conscious) body. This interaction requires an infinite number of *anus* to provide it a quality defined as “associability” and provides matter with psychic attributes. This conscious vargana also develops capability of *vaikrai* (transformation of shape and size of body) and *swachosvas* (breathing). The next (6<sup>th</sup>) category is defined as the first unassociable (sunya vargana) category. The next, ie *tejas* vargana (7<sup>th</sup>) results in association of energy with matter and leads to *tejas* body, which provides metabolic energy, paving the way to the animate world. The next category (8<sup>th</sup>) is another type of sunya vargana. Further association leads to *bhasha* vargana (9<sup>th</sup>) again followed by *sunya* vargana (10<sup>th</sup>). The next association leads to *manovargana* (11<sup>th</sup>), required for formation and functioning of mind. This interaction may enable neurons to get organized and function. This is again followed by sunya vargana (12<sup>th</sup>) and then comes the interaction of soul with subtle matter (karma vargana, 13<sup>th</sup>). 14<sup>th</sup> to 22<sup>nd</sup> varganas are described below. These are followed by the last vargana called mahaskandha vargana, responsible for the largest structures, where all forces and interactions in nature may simultaneously come into play. These structures pervade the whole universe.

What are these four sunya varganas. They have been variously interpreted by scholars. Some say that they do not always result in new aggregates. We try to interpret them in the frame work of known physics. We interpret them as the varganas which destroys (annihilates or dissociates) the aggregates. The first non usable or non associable vargana (6<sup>th</sup>) may, from simily with physics, be considered as antimatter, which on interaction with matter annihilates it and turns into radiation. Like wise every alternate vargana after 7<sup>th</sup>, ie 8<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> are non associable, that is they dissociate the psychic aggregates of *Tejas*, *bhasha* and *mano-* associations. By their interaction, energy, speech and mind is destroyed. From physics we know that when radiations interacts with radiation (eg photons with photons) or when energy interacts with energy (sound with electricity), no new forms of aggregates are always formed. Even when matter interacts with matter, it may change shape and size but new form of matter may not be formed. Only when matter interacts with radiation or energy interacts with matter, new aggregates may be formed. Thus Energy, consciousness, mind and speech varganas may interact with themselves but do not lead to new

aggregates; only when they interact with matter varjanas, they develop associability and result in new types of aggregates. The 15<sup>th</sup> is termed as discontinuous-permanent varjana may represent particle - wave duality. The 16<sup>th</sup>, permanent sunya varjana may imply that all associations are permanently destroyed as in pure souls. Thus we see that 1 to 6 aggregates are related to matter, 7<sup>th</sup> to 13<sup>th</sup> to consciousness and 17<sup>th</sup> to 22<sup>nd</sup> to soul. The last 23<sup>rd</sup>, embodies everything in the universe.

Some of these interactions may also be interpreted as sunya varjana, but the explanation given above of annihilation or dissociation may be more logical.

Modern chemistry deals with combination of matter with matter. Combination of the minutest particles known ie quarks and gluons to protons, neutrons and electrons etc and then their combination to form atoms comes under the purview of physics. Atoms to molecules to Compounds (and minerals) is the subject which comes within the purview of chemistry although lots of physics is also involved. Large structures (planets, stars, galaxies etc) are governed by gravitation and within these structures other forces play the usual role. It is a challenging task to reconcile the theories of modern physics and chemistry with the Jain theory of varjana, except to note that 7<sup>th</sup> to 22<sup>nd</sup> varjanas deal with certain aspects of consciousness and soul which is not a subject matter dealt with science.

# 11

## Jainism and Biology

### Living organisms are a miracle of nature

Jain scriptures have given considerable thought to physics, mathematics, cosmology, geography and chemistry, as we have briefly seen in the previous chapters but it is botany, biology and anatomy which is central to their philosophy, mainly because the main focus of Jainism is the living beings and their salvation. The approach of Jainism and modern biology is therefore quite different and except for some basic concepts, not much overlap is found. Jains, as discussed previously believe in various layers of bodies (karmic, luminous, physical etc; chapter 6) which a living being possesses. Chakras related to anatomy have been discussed briefly in chapter 6 and the main emphasis is to activate the various energy centres, which is useful in activating *Kundalini* required for emancipation. Therefore much importance is given to *prana shakti* (respiratory energy) which is vital in following this process. Although the Jain biology appears to be much wider in scope compared to the modern biology, many of its aspects may appear irrelevant and even inconsistent with the modern concepts. The whole approach of Jain concepts is to develop procedures for development of consciousness. Therefore they treat physical and psychic aspects together. For this purpose their approach is based on 10 physical forces and five psychic forces as we will discuss below. However, it may be emphasised that the jains have excelled in several concepts related to the living much ahead of the modern biology. For example since at least 2600 years ago and possibly even before (going back to the times of Rishabh), the jains believe that plants have life and can communicate, a fact discovered by modern science less than a few decades ago.

Rigorous definition of life has been elusive. Modern science as well as various philosophies have not found a complete and correct definition of life. Jainism defines life as having six attributes: reproduction, growth, metabolism, movement, response to external stimulation and adaptation to environment (which may imply evolution). However some of these attributes can also be found in non living (organic or inorganic) compounds. Detailed discussion of the various Jain concepts related to biology and botany is beyond the scope of this book and we will confine here only to those aspects which can be integrated with the theory of *Karma*. The theory of *Karma* was developed to deal with the living and logically explains the disparity between individual's present actions (karma) and their expected consequences in this life which some times seem unrelated or even contradictory.

The relevant aspects of Jain biology are summarized below:

1. Jain scriptures mention three different types of life: Audaric, Vaikrayik and Aharac which exist in different, well defined parts of the universe, they call regions of heaven, human habitation and hell. Thus life of different kinds may exist in many parts of the universe.
2. Jains have classified living beings on earth according to their sensory faculties, single sensed (eg plants), two sensed (worms), three sensed (ants), four sensed (butterflies), and five sensed (mammals, humans) *indriyas* (sensory organs : touch, vision, smell, taste, speech) which in a way is related to their increasing levels of consciousness. As far as the theory of Karma is concerned Plants and animals are treated at par, subject to the same rules
3. Unlike the Darwin's evolutionary theory, the life on earth, which gradually evolved in many steps, from mono cellular organisms to humans in the 3.5 billion years of geologic history (Chapter 1) , according to Jainism all species occur at all times. The two concepts together are consistent with the idea that life is not confined to only the earth but is spread through out the whole universe.
4. Jains believe in a soul in all living beings and therefore in reincarnation (rebirth) which explains the fate of different beings which apparently may not be a direct consequence of their actions in the current life but may be cumulative consequence of

karmas in the previous lives. Transmigration from one body to another is one of the corollary of this postulate,

In Jainism, much thought has been given to the process of birth. Apart from the usual processes of sexual and asexual births through conception (from eggs and from womb), pollination etc Jainism postulates that the liberated souls (above gunsthan 6) are born by some uncommon, non-natural, asexual process, as has been the case with Christ, the son of God, who was born to Mary the virgin, Rama (and his brothers) who were born by Yagna, Karna and some Pandavas who were conceived by Kunti from Sun God and Buddha, whose fetus was transferred from one womb to another. Buddhism also claims the “appearance” of Padma Sambhav from a lotus in a lake in Copper mountains.

Modern biology has made tremendous progress in the past few decades, with techniques of molecular biology, genetic engineering and determination of genome. There is much scope for research in biology keeping in view the various Jain concepts and equally importantly for confirmation of Jain concepts using modern experimental and analytical techniques. If Jain concepts can be rigorously formulated, the techniques of modern molecular biology can hopefully clarify many of them and provide rigorous scientific basis. For example a question arises whether the *Karman sharira* decides the genome or the sequence found in DNA. Cloning will resolve or confirm many Jain concepts about the existence of soul, and how it is embodied and the importance of various *karma* which always remain attached to the soul till it is liberated (chapter 4). If a large number of clones are made, they are found to be exactly identical with hardly a few exceptions. How can then, soul selects a body when it is born according to its *ayushkarma, Nam karma and gotra karma* (Chapter 4). This can be explained in many ways in the light of modern understanding, which would also be consistent with Jain theories of karma, but is a subject of further research and may require reinterpretation. Cloning can thus provide a litmus test to the Jain theory of Karma. Thus existence of soul with its adhering karmas can be verified, albeit indirectly or by inference if proper experiments can be formulated.

## Peace and Jainism

Peace to all living beings is the credo of Jainism and therefore this book would remain incomplete if we do not mention the Jain concept of peace. According to Jainism, peace is a fundamental quality of the soul, essential for attaining *infinite Ananda*, as discussed in chapter 2. Peace can not exist in isolation. Eternal peace is the primary state as well as the ultimate goal of soul. Peace is an internal aspect of mind as well as external aspect of the individual, family, society, nation, the world and indeed the whole universe; The internal peace of mind and external peace in the world are two different things; both are independent of each other but related as well. One can attain internal peace even when the external conditions are adverse and persons may appear externally peaceful even though internal peace eludes them. The Jain concepts of peace are different from most other philosophies.

The basic Jain approach to Peace is the welfare (mangal) of all living beings, from smallest insects to the biggest mammals. There are many aspects of peace in Jainism:

1. Welfare of self depends on the welfare of others; hence the principle of non violence. Welfare of all living creatures constitute the main thrust of Jain prayers.
2. Peace entails respecting views of others even if they are contradictory; hence the principle of *anekantvad*, discussed in Chapter 3.
3. Peace can not be attained without sacrifice on part of the self. Hence the principals of *Tapa*, living frugally, *aparigrah* and *asteya*.

Peace in some other thoughts, particularly in the western approach, implies safe conditions for one self without much concern about the safety of others. In contrast, Jainism believes that safe conditions for one self is only ensured when it is safe for everyone else in the world; hence there is more emphasis on the safety of others rather than oneself.

When one conquers one's own self, one attains internal peace but for external peace conquering the world is not essential. The Buddhism and Jainism have the same approach to peace: one need not be a super power with powerful weapons at its disposal to rule the earth. The real super power status is attained, not at the point of gun, but when others willingly share and follow your thought and philosophy. A case in point is Buddhism which started in India but at one stage more than half the world, including China and Tibet to the north, Japan, Malayasia, and Indonesia to the east, Afghanistan to the west and Srilanka to the south, besides India followed Buddhism in thought as well as in action. In oriental thought this is the real mark of a superpower.

Non-violence and forgiveness are the prime requirements for peace. Non violence should be practiced to the extent that you do not hurt any creatures in thought, words and deed and you seek forgiveness in case some one is hurt, knowingly or unknowingly. Most people in the world do not like violence and in this respect they follow Jainism to some extent. Jainism does not permit violence in thought and action and even support of violence for any reason whatsoever even at the cost of the physical safety of oneself or in self defence. Non violence must start at the lowest level of living species and should not be confined only to humans. Vegetarianism is thus basic to Jainism. There is detailed procedure for seeking forgiveness. First one should purify the body by fasting and observing other *Tapas*, then purify the mind by doing *pratikraman* and then ask for universal forgiveness as discussed in chapter 6. It can be done on daily or yearly basis. The Jains have earmarked a day every year, called the universal day of forgiveness, for seeking forgiveness. This certainly brings peace and harmony in the family and society. It is hoped that the Jain practices will lead to a peaceful world and bring welfare to one and all.

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## Appendix: 1

### Some inconsistencies in Jain geography and cosmology with modern science

Science has made tremendous progress in observational techniques and theoretical modeling during the last four hundred years, since Galileo first looked at celestial bodies with his telescope and Newton enunciated the laws of motion. As mentioned before, Jainism considers Lokvad as an essential part of its darshan and asserts that the truth is interwoven with the universe. We can not therefore ignore the scientific studies. It may be noted here that science and Jainism, both are quests for truth and at least in the physical aspects, they both should be consistent. This has to be considered within the framework of their limitations. Science can be incomplete, always amenable to modification, but can not be wrong as it is based on observations. Of course it carries with it the limitations of *indriyas* and intellect used for observations and comprehension. Jainism, on the other hand, has no such limitations since the *gyan* given by Tirthankaras is *indriyateet*. But there is no record of words as spoken by the Enlightened. They all have been compiled much later and have been subjected to interpretation. They are thus subject to limitations posed by the competence of the compilers.

The glaring inconsistent aspects between Jain scriptures and modern science mainly relate to

1. Geography: Remote sensing by space techniques have given us very clear picture of geography of the earth and planets
2. Cosmology: Here “cosmology” is taken as to include planetary sciences too.

Under these two general headings, we list below some of the concepts mentioned in the scriptures which appear to be “erroneous”:

1. Flat earth concept:

*Jambu Dwip Pannati* describes the flat earth theory, with two suns and two moons. This appears to be a concept prevalent at that time in the west as well as in the orient and does not seem to be an exclusive Jain concept. Some Jain scholars have tried to fit in existence of two suns and two moons in the following manner: There is a theory of formation of planets which postulates that in the beginning, before our solar system came in to existence, two stars (one of them being our sun) had a close encounter and pulled out material from each other in a cigar shaped mass, which subsequently coalesced in to planets. The other star then

moved far away on its course and it is not possible to identify it now. This theory is no longer in vogue and has been replaced by the theory of solar nebula formed from a cold, rotating, dense molecular cloud which gave rise to Sun and planets as it contracted. The two moon theory is explained on the basis that the Earth at times, temporarily captures another satellite as the small bodies of the solar system (asteroids) pass by. This is quite plausible and has happened occasionally, though at present the earth has only one big satellite, our Moon and millions of small bodies (dust particles) going around. These small bodies can hardly be called natural satellites. The period of day and night varying between about 18 and 6 hours, mentioned in the *Surya* and *Chandra pannaati* do not fully give the range of their periods from polar to equatorial regions of the earth (which ranges upto 6 months), and is probably a result of limitation of observation from the limited region of Jambudwipa, that is India.

1. Distance and motion of Sun, Moon and other planets

The distances of the Sun and Moon from the earth are mentioned about equal (800 yojans). Infact the scriptures mention that sun is slightly closer to the earth than moon (may be because the sun is brighter?). This is totally erroneous. The sun is 400 times bigger and 400 times farther from the earth as compared to the moon.

2. Structure of the universe:

It is mentioned that the universe has a peculiar shape (Fig. 8.2). Such a structure is absolutely unstable. This may be taken as projection of a three (or four?) dimensional structure on two dimensional sheet of paper. Cosmological models mentioned in the scriptures depict a multi- angular shaped Loka within infinite Aloka. Physics demands that (1) natural shapes are not angular and stable; spheroids, ellipsoids and disks are natural stable shapes (2) there should be an interface between any two bodies ie between Loka and Aloka.

3. Shape of *Jambu Dwipa*: Remote sensing and photography from space has given us a definite idea about the shape of continents on the earth. According to scriptures, the continents are circular, each surrounded by a salty ocean (*Lawan samudra*), each outer structure being twice the size of the previous one, is entirely wrong. This reminds us of quantum mechanical model of the atomic orbits where orbits go in an integral function of n (n=1,2,3...).

Like wise there are other innumerable examples which are not consistent with modern science. The list is long and would need a separate treatise to discuss all of them but we have chosen only a few examples mentioned above to illustrate that many concepts need to be

critically examined and revised. Many of these problems have been pointed out by several scholars, specially B.R.Singhvi in his book “*Jain Dharma ki asangat batein* (1943)”.

We may reemphasise that these concepts have been compiled by later scholars, much after Mahavir and have been influenced by other prevalent ideas and are not a direct rendition of the Tirthankar’s words.

One may wonder that if so many errors have crept in over the course of time, then what is the reliability index of scriptures. In this context, we want to mention that there indeed exist many valuable concepts in the scriptures and they represent a deep understanding of the universe, not withstanding the points made above. Without being influenced by the high precision of calculations and numbers given in the scriptures, each calculations must be critically examined in view of the large mass of the scientific knowledge now available before they are accepted as the words of the Enlightened.

*Jainism, as discussed in this book, propounds that one is alone in this universe and there is no one who can help in his goal including the “God” or the Enlightened ones and one has to charter his own path. Then is there any point in praying to the Enlightened Kevalis? The answer clearly is “Yes”, because they can surely help in one way, that is, by showing us the path. We therefore end this book by bowing to Arihants, because they have shown the path to Moksha and removing all our doubts, to Siddhas, because they have shown the path of right perception (darshan) by their own example, the Acharyas, for they have shown the path of right charitra by practicing it, the Upadhyayas for imparting us the right knowledge, to all sadhus in the universe who set example and guide us along the right path. Thus by emulating them, I can also acquire samyag darshan, samyag charitra and samyag gyan. Without them, how could I have known the right path of moksha?*

### ***Namokar mantra***

*I bow to the Enlightened souls (Arihants and Siddhas) Who realized true knowledge of kevalgyan and showed the path to attain it,*

*I bow to the Jain sadhus and sadhvis (Acharyas and Upadhyayas),*

*Who carried the flame of Jainism from the Enlightened ones to me, without which I would have lived and died in ignorance”*

*I bow to the thinkers and scientists*

*Who by formulation and experimentation revealed the secrets of nature*

*I bow to one and all in this universe*

*who sustain me so that I understand and pursue the true path of Enlightenment.*

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*Thou inconceivable, incomprehensible, ineffable*

*Invisible, inscrutable, impalpable, unfathomable*

*Thou without beginning, without time*

*Thou unclouded wisdom, unerring vision, true existence!*

*George Norektsi, AD1000*