

Living Systems in Jainism: A Scientific Study

Narayan Lal Kachhara

Kundakunda Jñānapīṭha, Indore

Living Systems in Jainism: A Scientific Study

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ISBN: : 81-86933-62-X

First Edition : 2018

Price : Rs. 350/-
\$ 10.00/-

Publisher : Kundakunda Jñānapīṭha
584, M.G. Road, Tukoganj
Indore – 452 001, India
0731 – 2545421, 2545744
Anupamjain3@rediffmail.com

Financial support : Manohardevi Punamchand Kachhara
Charitable Trust,
Udaipur

Printed at : Payorite Print Media Pvt. Ltd.
Udaipur

Dedicated to

My son Raju

Whose departure proved a turning point in my life

That changed the course from

Professionalism to spiritualism

Publisher's Note

Sacred books written or compiled by Jain Acharyas are the rich source of knowledge. These texts and the commentaries written by later Acharyas are now being studied by monks and scholars in various contexts. These sources provide us guidelines and directions for meaningful living, searching the purpose of life and knowing the nature and its interactions with the living beings.

The religious texts are studied from the following points of views:

1. Spiritual. The texts were primarily composed for giving the human beings the knowledge for making spiritual progress ultimately leading to the state of permanent bliss.
2. History. The texts provide historical information about the ancient period.
3. Culture and art. The texts contain information on culture and art of those times.
4. Science. The texts contain a treasure of knowledge about the realities of nature and its interaction with the life of living beings. This branch of knowledge earlier studied as philosophy is now known as science.

Traditionally the scholars have been concentrating on the first three aspects of studies and not paying much attention to the fourth aspect. With the advent of modern science this part has gained importance and there is need to study the Aagams and other texts to explore the scientific contents and compare this knowledge with the findings of the modern science. Study of this kind cannot be made in isolation, knowledge of spiritual aspects of religious texts as well as the knowledge of modern science is necessary to properly interpret and understand the writings and putting the ancient ideas in proper perspective with respect to modern science.

Some efforts have been made by recent Acharyas and scholars for scientific study of Jain literature. Acharya Mahaprajna, Acharya Kanaknandhi, Acharya Vijay Nandighoshsuri and Muni Mahendra Kumar II have highlighted the importance of scientific study and have written valuable books on this subject. Scholars like G.R. Jain, N.L. Jain, K.V. Mardia, etc. have also written books on different aspects of scientific knowledge contained in these texts.

Mathematics in some form has traditionally been used by Tirthankara in their teachings. Mathematics was further developed by many Acharyas to support and explain the concepts and doctrines propounded in Aagams. Jain Acharyas occupy a respectable position in

the field of development of mathematics in India. This mathematics has been studied in modern context by recent scholars like B. B. Datta, H. R. Kapadia, A.N. Singh, L.C. Jain, Anupam Jain, R.S. Shah, Dipak Jadhav etc. It has been shown that many of the mathematical ideas credited to modern (Western) mathematicians were known to ancient Acharyas many centuries ago.

Modern science is challenging the religious philosophies and has captivated the minds of new generation. In such a scenario the religion that can stand the challenge of modern science is more likely to find acceptance and respect from the people. In this respect Jain philosophy has a unique position among all philosophies as it is based on laws for both the living and the non-living constituents of nature and rejects the idea of any super power like God, the Creator and Controller of the phenomena of universe.

Professor Narayan Lal Kachhara, engineer by background, has been studying Jain philosophy in scientific context and writing articles and books to present the scientific content of Jain philosophy and making their comparison with modern scientific developments. His books like Jain Metaphysics and Science: A comparison and Scientific Explorations of Jain Doctrines are notable contributions in this direction.

The present book of Prof. Kachhara is the pinnacle of his efforts to explore the scientific nature of Jain philosophy and extension of its application to the modern branches knowledge like consciousness studies, psychology, evolutionary biology, epistemological studies, cosmology and human behavior. The author has lucidly presented the Jain ideas in modern style and has examined the possibility of extension of Jain ideas to understand the advancements of modern science in the field of human intelligence, mental faculties, extra terrestrial life, the fate of the universe, etc.

Kundakunda Jñānapīṭha is happy to publish this work of Prof. Kachhara which makes a very interesting reading both to scholars of Jainism as well as of science. It is hoped that the book shall inspire readers and scholars to further explore the scientific contents of Jain philosophy, expand the horizons of our knowledge and establish Jain philosophy as the true source of knowledge, even for modern science to learn from it, and apply this knowledge to the welfare of the entire living class. The book is expected to be a milestone in our understanding of life processes and the universe.

Dr. Anupam Jain

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Opinions of Scholars

It is a pleasure to write about this book, entitled *Living System in Jainism: A Scientific Study* by Dr. Narayan Lal Kachhara. The book is one of the sincere attempts to interlock the two eras: one the ancient and other the modern, one with enormous faith and other with speculation, one with super-empirical and other with empirical evidence. Einstein once said that religion without science is lame and science without religion is blind. Dr. Kachhara's effort is like eliminating the lameness and blindness of this era by coordinating Jain religion and philosophy with science. Many subtle and complicated issues related to physics, chemistry, and cognitive science found in Jainism is explained with correspondence to modern scientific terms. This of course, is the result of scholarly and hard devotional work. This book will form a base for further scientific studies in Jainism.

For the student and learner of science and Jain Philosophy it is a readable text and the author has done it very well. I recommend this book to the scholarly world.

Samani Dr. Chaitanya Prajna

(Ex-Executive Director of BMIRC, JVBI)

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This book, an excellent review of existing knowledge on living systems in Jainism, has been brought out against the backdrop of vast experience of author on the religion. It is an inspiring and practical book intended for researchers and for those who are looking into mysteries of life and relevance of our existence on the earth and other planets. Thus this thought provoking book is an excellent resource to students, educators and experts on the subjects.

In this ambitious work, Dr Kachhara presents a broad analysis of living systems in Jainism and comparing it with other philosophies. The

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author supplies an in-depth analysis of scientific aspects of some of the most intangible elements of the human existence. This is the best single place where one can begin further research on the subject. Author gets into the heart of the principles and practices, and few words are needed to describe this book as the most authoritative in describing the relationship between soul and body in human and other animals.

Soul is centre place of all living beings and is non-corporeal. Current science has not been able to explore it and has largely remained philosophical. Author has tried to answers some of the questions related to it in a scientific way. The organization of the book allows the reader to easily follow the evolution of living systems on the planet earth. The book is divided into 14 chapters that reflect scientific approach to Jainism. Starting with the comparative view on soul and consciousness in various philosophical systems, reader is taken for a journey through various facets and intricacies of karma, evolution of life and mind, biological intelligence, knowledge and many more. I am particularly fascinated on 3rd chapter related to 'Doctrine of Karma' and on chapter 8 related to 'Philosophy of Mind'. Each chapter is completed by a bibliography at the end which will be great help to researchers.

I will conclude with that those who want a thorough review on the subject, this book is second to none and expect from author many more such contribution in future.

Dr. Pratap Sanchetee, MD, DM

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This book provides an extensive review of living systems in Jainism in the modern scientific context. This is a very original piece of work and covers several dimensions of living systems like consciousness, soul, karma theory, psychological aspects, knowledge, intelligence, emotions, quantum physics, and others. I feel that this is the first serious attempt to study the possible interconnection between karma and the soul diagrammatically in an easily understandable language. The

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scientific spirit behind this approach is a breakthrough in the better understanding of the dualism of the soul and matter in the most systematic way. The description of forty-seven characteristics of the soul in Jainism on one hand and the simultaneous description of consciousness touching the latest developments in the field, including those of quantum physics, neurophysiology, psychology and the finer structure of neurons, will provide new insights to the world for further exploration of the concept of soul in Jainism and in modern science. I wish that all intellectuals working in the multidisciplinary fields of soul, body, consciousness, biology, psychology, quantum physics, and religion should read this book and take the search to understand living systems in the right direction.

Dr. Surendra Singh Pokharna

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Foreword

My friend, Dr. Narayan Lal Kachhara, has devoted many years to the study of the soul/consciousness from the modern as well as ancient perspectives. The outcome of his study in the form of this book entitled *Living Systems in Jainism: A Scientific Study* looks interesting and highly valuable. I am thankful to Dr. Kachhara for his invitation to write a detailed Foreword. In response, I thought that I should try to present my understanding of the soul based on ancient descriptions as well as the views of modern scientists.

The spiritual Science starts with the consideration of soul. When somebody talks of soul, many persons think that this is against modern science. This attitude is not rational because modern science has neither proved nor disproved the existence of soul. How can anyone prove anything without any serious attempt? If we look at the budget of scientific research of any nation, we will find that almost the whole budget is spent for those projects which are important either for business or for defense. Little is spent for research on soul. Even in the study of subjects like Biology and Medicine the scientific community is mainly interested in procreation and the functioning of different parts of animal and human bodies. Under these circumstances also, many scientists have come forward to provide the logic in favor of the existence of soul.

Science deals with space, time, matter, motion and the resting of matter. These five aspects of the universe are attributed to the five non-living Dravya of Jainology. For details regarding these, one may refer to the fifth chapter of the *Tattvarthasutra*, authored by Acharya Umaswami 2000 year ago. *Jiva* is considered to be an independent Dravya in Jainology. Thus in all, according to Jainology there are six kinds of Dravya. If the *Jiva* or soul is established in science, then there would not be much difference between the basic descriptions of science and that of Jainology. This statement is significant because of the fact that, like science, Jainology also admits that the universal intelligence is exhibited through the natural properties of Dravya occupying the universe.

Acceptance of eternal soul by Nobel Laureate George Wald

The soul as an eternal substance or Dravya is not formally recognized by modern science. However, several great scientists have

advanced their own logic in favor of the soul. Dr. George Wald of Harvard University (USA) won the Noble Prize for medicine in 1967. He advocated the existence of the soul as a real eternal substance different from the matter and waves of Physics and Chemistry. In his words: "**And as Upanishads tell us, each of us has a share in Brahman, the Atman, and the essential Self, ageless, imperishable.....**" [1]

Wald discussed in detail the logic behind the acceptance of the soul. For soul he used several different words, such as mind, consciousness, Atman, and essential self.

Location of Consciousness

The Noble Laureate Wald argues that when light falls on his eyes he responds to it. Similarly, a photo-electrically activated door also responds to the radiations falling on it. Just as a computer does not feel elated when it beats a human player at chess, the photo-electrically activated garage door also does not know about its performance. He also says that as far as his performance is concerned, he knows that he sees.....With this assumption that he knows but a garage door or the computer does not know, he further proceeds to the light falling on the eyes of a frog. As a scientist, Wald says, he is sure that a frog reacts to the light falling on its eyes, but as a scientist he cannot prove that the frog is self-aware of its reaction. In his own words [1]:

But I know that I see. Does a frog see? It reacts to light; so does a photo-electrically activated garage door. Does the frog know that it is reacting to light, is it self-aware? Now the dilemma: there is nothing whatever that I can do as a scientist to answer that kind of question.

Does a frog know that it is reacting to the light falling on its eyes? Does a frog have consciousness? If the answer to these questions is yes, what is the location of consciousness inside the body? To get the answers to such questions Wald consulted a great Canadian brain surgeon, Dr. Wilder Penfield. Penfield was once hoping to find the centre of consciousness in the brain. But by his experiments he arrived at the conclusion that "**it will be impossible to explain the mind on the basis of neuronal action within the brain.**" It has been found that the mind can neither be located in the brain nor in the nervous system nor in the cerebral cortex.... Penfield investigated this issue in depth and published

his results [2]. One of his findings conveys that consciousness gives us no physical signals and, therefore, it is not possible to locate the center of consciousness in the body. In the concluding section he writes: “... **I am forced to choose the proposition that our being is to be explained on the basis of two fundamental elements ... mind and brain as two semi-independent elements.**” These conclusions are explained by Dr. Wald with the logic that the mind or consciousness could not be located simply because “**consciousness gives us no physical signal.**”

The whole situation is thus quite clear. Scientists (like Penfield) on one hand infer that consciousness may exist, but on the other hand they admit that it cannot be located since it does not give any physical signal. Wald at this juncture suggests that both these points can be valid if we consider consciousness to be made of stuff beyond the domain of the material particles and waves of modern science. Wald names this mind stuff or Atman. In other words, consciousness neither consists of chemicals nor is it due to chemicals. It is a special class of stuff that may be called soul or *Jiva* Dravya. The conclusion of Erwin Schrodinger, who won the Noble Prize of Physics in 1933, is similar. Schrodinger, in his famous book *Mind and Matter* [3], writes: “**Mind has erected the objective outside world of natural philosopher out of its own stuff.**”

From the Big Bang to human beings

Another example of the logic advanced by Wald is based on the wonderful nature of the universe that breeds life. This logic arises when one studies the development of the universe and human beings starting from the Big Bang that occurred nearly 13.7 billion years ago. (We are not debating the veracity of the Big Bang here. It may even change. At present it is also not our concern to compare the Big-Bang model with the description in the ancient literature.)

The Big Bang model assumes that just after the Big Bang the universe came into existence. At that moment there were only very tiny particles in the universe. These very tiny particles were then converted into electrons, protons, etc. These particles then combined to form atoms and molecules. By the union of such particles, stars and celestial bodies were formed. Life came when favorable chemicals and suitable climates became available. If we calculate the odds of such happenings, the chance of the formation of excellent systems such as the human body is

as negligible as the chance of formation of an aeroplane out of a blow in a junkyard by a hurricane. Dr. Deepak Chopra [4] in his book *Perfect Health* has expressed this argument in very nice words:

The universe, after all, is not energy soup; it is not mere chaos. The incredibly exact fit of things in our world above all, the astonishing existence of DNA, argues for an infinite amount of intelligence in nature. As one astrophysicist put it, the likelihood that life was created randomly is about the same as the likelihood that a hurricane could blow through a junkyard and create a Boeing 707 [1].

Wald nicely summarized the difficulties in the formation of human beings by a random process in the following words:

...If there had not apparently existed a one-part-per billion inequality in the number of particles and antiparticles that went into the Big-Bang; if the atomic nuclei were not so much massier than the electrons weaving about them; if the electric charge on the proton did not exactly equal that on the electron; if ice did not float; if the forces of dispersion and aggregation in the universe were not in exact balance - then, there might still be a universe, but lifeless [1].

Just to appreciate so many 'ifs' raised by Wald, we can take one simple example: the floating of ice on water. Our common experience shows that usually a substance in solid form is heavier than in its liquid form. However, ice is an exception: it is lighter than water and as such it floats on water. This is very powerful statement. Is this by chance? One can say that the properties of water molecules are such that ice is lighter than water. But the question may be asked, why does "nature" have this exception that ice can float on water, so that by this property of water creatures can survive in the water below the floating ice? In the words of Wald:

If ice did not float, it is hard to see how any life could survive a cold spell on any planet in the universe, if a freeze occurred even once in millions of years, that would probably be enough to block the rise of life, and to kill any life that had arisen.

Wald, therefore, concludes, **"If ice did not float, I doubt that life would exist in the universe."**

This highly favorable course of development of the universe is accepted in Physics under a term known as the “Anthropic Principle.” According to this principle, all of creation since the Big Bang was designed expressly to lead to the existence of human beings [5]. Is this not a backdoor entry of intelligence into Physics?

Acceptance of soul

The whole explanation for this can be very simple if the presence of soul or *Jiva Dravya* is recognized from time immemorial. In such a case, it would be very easy to say that nature is such that souls and material bodies can co-exist. This has been the line of thinking of Wald and many others. In the words of Wald:

In this talk I have propounded two riddles: One, the very peculiar character of a universe such as ours that breeds life; and two, the problem of consciousness, mind, a phenomenon that lies outside the parameters of space and time, that has no location.

Just after writing these two riddles Wald writes the following paragraph that leads to the solution of both riddles:

A few years ago, it occurred to me that these seemingly very disparate problems might be brought together. That would be with the hypothesis that mind, rather than being a very late development in the evolution of living things, restricted to organism with the most complex nervous systems - all of which I had believed to be true - that mind instead has been there always, and that this universe is life breeding because the pervasive presence of mind had guided it to be so.

Wald further clarifies the word “mind” by recognizing it as “mind stuff,” which is real but different from the material particles and waves described in Physics and Chemistry. Wald uses the word “Atman” or “Brahman” as synonyms for “mind stuff” or consciousness. By the word “stuff,” Wald wants to emphasize that it is a concrete, eternal entity. As in the case of matter, the form of the substance changes but the substance itself always remains, similarly a soul is also a substance in the sense that its form changes but it always remains. The equivalent term for the “stuff” of Wald in the Jain Philosophy is “*Dravya*.” Different words such as mind or consciousness may have a different meaning to different writers and religions. However, the conclusion which we want to derive

here, and which Wald intended, is that Atman (or soul or *Jiva Dravya*) is an eternal substance. This stuff is of different kind, and as such Atman cannot be detected by physical instruments. Further, the eternal presence of such stuff has been responsible for the favorable nature of the universe that breeds life. Thus by recognizing the existence of the soul, Wald could lead to the solution of the two big problems of science.

Several Top-level scientists believe in the soul/God

1. One of the proponents of the Big-Bang model, Prof. Stephen Hawking, has frequently used the word "God" in his famous book *A Brief History of Time*. As an example, on p.143 of the book [6] he writes, "**God may know how the universe began, but we cannot give any particular reason for thinking it began one way or the other.**" (At present our purpose is not to discuss "God" or to interpret Hawking's God. We simply want to convey that the concepts of God/soul are not unpopular in the scientific community.)
2. Because of the historical development of science, it is not very fashionable to talk of the soul/God, but it is becoming more and more popular in recent years. The scientists who have pursued research at the most fundamental level of theoretical physics or similar allied areas are more likely to realize the incompleteness of the materialistic description of the universe. Such micro-sciences are very close to philosophy. This is one of the reasons that many such scientists like Newton, Einstein, Bohr, de Broglie, Schrodinger, Pauli, Josephson, Wigner, etc., have been spiritual. This is not surprising, because in a room near the kitchen it is more likely to smell the flavor of the food items being cooked than it is to smell them in a distant room. When a similar point was raised before Charles H. Townes [7], Nobel Prize winner of 1964 (Physics), he gave the following reply:

I think one reason physicists tend to be more philosophical is that physics is a very basic science. Physics is concerned with fundamentals, and it leads one to a very basic attempt to understand the universe. But there are others; for example, astronomy leads one in that direction, too...

3. It we look at the history of the development of science, we will find that there were many occasions that a valuable theory was either not accepted or not pursued for a long time. There may be many reasons for such a trend. One of these reasons is the immediate return to a scientist in the form of project funding and recognition. The slow progress in the past regarding the effect of the meditation/exercise/mind/vitamins on physical health is a strong example to show the neglect of a valuable field. It is also worth noting that if scientific research is not valuable to defense or business, then it is less likely to receive a large amount of financial support. To support this point, we may quote Maurice H. Wilkins who received the Nobel Prize in Medicine in 1962:

Most scientists today are being led increasingly away from the fundamental aim of science to achieve unity into rather limited ways of thinking without much open mindedness and are doing things merely to meet limited material needs. In particular, about half the world's scientists and engineers are now engaged in war programs [8].

Wilkins wrote these lines in 1986 and it appears that these are valid even today. In the same article, he further cautions scientists that only materialist research is narrow-minded. He writes:

It's not just a question of the war danger. It is also a question of how science is developed through educational institutions and through institutionalized science. I agree with Einstein that the sort of scientific education we have now has produced a narrow-minded way of thinking amongst scientists, so that they give no proper attention to the moral and psychological dimension [8].

4. The following statement of Dr. B.D. Josephson, who won the Noble Prize in Physics in 1973, is also strong evidence to show that some scientists are very enthusiastic about the intelligence/soul/God, i.e. something other than the materialistic things:

And we might hope that appropriate mathematical tools will be developed, so that in not too many years from now we'll have a new paradigm in which God and religion will be right in the middle of the picture, instead of being pushed out almost entirely as is the case at the present time [9].

5. Dr. Fritjof Capra who is a well-known physicist and author of *The Tao of Physics*, strongly believes in the soul/God and in ancient Eastern traditions. According to him, his belief is based on modern science. In an article, he writes [10]:

...I realized that not only modern physics but modern science in general leads us to a world view which is very much in agreement with the ancient Eastern tradition.

6. If there is no separate existence of the soul inside a human body, then human beings would be simply an advanced form of machines which are composed of a material substance consisting of atoms and molecules. A highly respectable scientist of the era who won the Physics Noble prize in 1963, Dr. Eugene Wigner, has touched on this point to express his views in favor of the existence of the soul. In an interview on Sept. 3, 1985, he remarks [11]: **"We are not machines. If man were a machine, then it should be possible to describe him in terms of atoms and molecules, and I don't think that is possible."**
7. This list of topmost scientists who believe in the existence of the soul/God is not complete. This list and the names of other scientists mentioned earlier is simply an attempt to show that the acceptance of God or the soul is not out of fashion even among the best scientists of the modern world. In addition, we should also keep in mind that many scientists are not in a position to address the issue of the existence of the soul because of their focus on material goals, and the nature of their training – as revealed by the fact that about half of the world's scientists and engineers are engaged in war programs.

Artificial intelligence and emotions versus the soul

After somewhat more advancement in computer technology it may be possible to create a robot with artificial intelligence such that it can share and express emotions such as fear, sorrow, joy, and anger. This development leads to some questions: Would this not mean that memory, fear, anger, joy, and sorrow are attributes of material atoms, chemicals and electrical signals? After accepting this point, would we retain any

special role for the soul? Would this then prove that man is only an advanced form of robot made of material particles and electrical signals?

These questions are helpful in understanding the real attributes of the soul. For example, Acharya Kundakunda in *Samayasara* [12] explained very clearly that emotions such as anger, fear, joy, etc., and the knowledge achieved through the senses are not real attributes of the soul. Had these attributes been real attributes of the soul, Siddhas (pure omniscient souls) would also have possessed those. According to Jain philosophy, Siddhas are without any material body. They do not have a brain, lungs, heart, bones, skin, nerves, emotions etc. They are always in a state of bliss which does not depend on an electrical signal or atom or chemical. This bliss state is a real attribute of the soul.

A great philosopher of modern times, J. Krishnamurty, also discussed a similar situation of emotions in a robot. For example, an article [13] in the *Sunday Review* discussed this point along with the philosophy of J. Krishnamurty. Such an understanding is very important. If a person accepts emotions to be the soul, his faith would disappear when such a powerful robot became a reality. Taking into consideration this point, this article concludes with an excellent sentence: **"The only mind that can survive the challenge of the new technologies would be such a mind which is the truly religious mind."**

Soul in Jain philosophy

According to Jain metaphysics, the cosmos is a congregation of six kinds of substances, called *Dravya*. The *Jiva Dravya* (soul) is one of six kinds of substances. Nobody can create any soul and nobody can destroy any soul. In other words, the number of souls in this cosmos remains invariant forever.

In Jain philosophy, the soul is described from two points of view: (1) relative point of view and (2) real point of view. From the relative point of view, the emotions such as greed, anger, etc. and thoughts of liking or disliking associated with a living being are also considered to be part of the soul along with the real, eternal soul stuff. Just as any harm to an employee of a king is considered harm done to the king himself; this relative point of view considers the physical body and senses of a living being to also be *Jiva* [14]. But from the real point of view, only the eternal

soul stuff is considered to be the soul. The temporary associates of the soul (such as emotions, etc.) are not considered to be the soul. For more details regarding the soul from the real point of view, the following stanza 49 written by Ācārya Kundakunda in *Samayasara* 2000 years ago is worth noting:

***Arasamarūvamagandham avvattam chedaṇūguṇamasaddam.
Jāṇa aliṃgaggahaṇam jīvamaṇiddiṭṭhasaṃṭhāṇam. ||49||***

Meaning: Know that the soul is without taste, without odor, without sound, without definite shape, invisible, imperceptible to sensory organs or instruments, realizable not by any mark or symbol, and characterized by the consciousness attribute (*Chetana*).

Though taste, color, smell, touch, sound, etc., are associated with the physical body of a living being, these cannot be considered to be attributes of the soul (*Jiva*). A soul is different from the associated physical body. Through this stanza, Acharya highlights that the essential attribute of the soul is consciousness (*Chetana*).

According to Jain metaphysics, taste, color, smell, and touch are specific attributes of matter. They are not found in the soul. Similarly, sound consists of matter. It is not an attribute of the soul.

Since the soul is a *Dravya* (substance), it is expected to occupy some volume, i.e., it must have some shape and size. A soul may be of a size of an ant in this birth and the same soul in another birth can have the shape and size of an elephant. (According to Jain metaphysics, the size and shape of the soul of a living being is close to the size and shape of the associated physical body). This feature regarding the size and shape of a soul has been expressed in this stanza by the word *Anirdishṭa Samsthanam*, meaning indefinite shape and size (because its shape varies according to the body it occupies).

We know various technologies of detecting material things. For example, ultrasound, X-rays, infrared, gamma rays, etc., are used to detect things which are invisible to the naked eye. This stanza says that the non-physical soul cannot be physically identified by any present or future technology or device. Acharya Kundakunda has highlighted this point by stating that the soul is invisible and cannot be expressed by any physical analogy.

Here one may ask a question: If the soul cannot be physically identified by any technology or the senses, how can it be known? To answer this question, Acharya uses a powerful word *Alingaggahanam*, which means that the soul can be realized without any mark (*Linga*). In other words, the soul can be realized without inference based on sense perceptions, i.e., it is only possible by the direct experience of the soul by the soul.

It may be noted that this stanza is so significant that it has also been included by Acharya Kundakunda in his *Pravachansara* (as stanza-172), *Niyamasara* (as stanza-46), *Panchastikaya* (as stanza-127), and *Ashtapahuda* (as stanza-64).

The Sanskrit word for the soul is *Jiva*; and the *Jiva* in Jainology has two popular meanings:

Meaning 1: *Jiva* = Soul

(This description is in context with stanza 49 of *Samayasara* refers to Meaning1.)

Meaning 2: *Jiva* = Living being = Soul + physical body

It is not simply a matter of vocabulary. For our day-to-day life Jain philosophy suggests that we to recognize our self not only as the *Jiva* of Meaning2 but also that of Meaning1.

At first glance it appears difficult to accept oneself as a *Jiva* with these two different meanings of *Jiva*. However, through logic and analogies one can handle and appreciate the advantages of both the meanings without any confusion or difficulty. How? Let us see one analogy:

Mr. XYZ is the CEO of a company. The company wants him to have one bank account in the name of Mr.XYZ as CEO of the company. The company also allows him to keep his personal account in the bank in his name, i.e. Mr. XYZ. Thus Mr. XYZ handles two bank accounts in his name: one as Mr.XYZ as CEO and another as Mr.XYZ as a person. He does not have any confusion in handling these two accounts. For personal matters he uses his personal account and for official matters he uses his official account. He knows very well that he is not the real owner of the money deposited in his official account.

Jain philosophy also teaches the similar lesson. It says: one should recognize oneself as a *Jiva* with the views provided by Meaning2 as well as Meaning1. One should have this understanding that the assets and liabilities associated with Meaning2 are not the real assets and a liability of one's real self. One's real self is described by Meaning1. This multiplicity of two (or sometimes more than two) views of *Jiva* that are accepted by Jainology has a special significance. Scholars of philosophy recognize this multiplicity with the respectable and popular term *Anekanta* or Jain's *Anekanta*. The literal meaning of *Anekanta* is "multiple views." It may be noted that the view provided by Meaning1 is called the real point of view and that provided by Meaning 2 is called the relative point of view.

Our lifetime is limited. We cannot afford to wait for a certificate in favor of the existence of soul from scientific laboratories. Instead, we may try to experiment at our own level. For example, through meditation we may try to have realization of the soul. In this regard, the method described by Acharya Amritchandra 1000 years ago in stanza 23 of Ref. [15] may be helpful. This stanza suggests that for 48 minutes (one *Muhurta*) one should try to experience the soul by pretending to be a neighbor of your physical body (and other related possessions). Further, in stanza 34 of the same, the Acharya suggests us to continue such experiments for 6 months in order to realize the soul.

I am sure that this book is going to answer many questions regarding the soul/consciousness in living systems; as a stimulating work of science, it is also expected to produce new questions and curiosity. All such outcomes, I hope, may be helpful to the readers in achieving the direction of peace and bliss.

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“Have faith only in that which you know and understand.” - Mahavira

Preface

The existence of the soul has been accepted in most Indian philosophical traditions as well as Western religious traditions in some form. The soul is attributed with some properties that are not found in matter or other substances. Modern science has explored the realm of the physical order of existence in great detail and is trying to explain the processes taking place in the bodies of organisms on the basis of physical laws. Modern science accepts the property of consciousness as a special characteristic of living beings, but pleads that this is an emergent property of matter in some way. This theory, however, is not able to explain all of the observed phenomena and behavior in human beings and other organisms, and scientific opinion is divided on this particular issue. Some scientists do not hesitate to accept the existence of consciousness as a property independent of matter, but they are not able to offer any experimental proof for it. According to Jainism and other Indian philosophies, consciousness is a property of the soul, and the soul, being non-physical, cannot be directly verified by experiments.

This perspective makes it very interesting to study the concepts of Jain philosophy in the light of modern science, to highlight the properties of the soul which are exclusive to it but important to understand the structure, processes and other phenomena taking place in living organisms.

The Jaina conception of *Jiva* (Soul) occupies the first place among the doctrines of independent soul. The Jaina view of soul appears to be older than the views of other Indian systems of thought; it was well established as the object of meditation for liberation of Lord Parshvanath in the eighth century B.C. The Jaina doctrine of the soul has not changed between long ago and the present, as happened in the Buddhist and Vedic traditions.

In Jain metaphysics the universe is comprised of six kinds of substances. Two of them, *Jiva* (soul) and *padgala* (matter), are active substances. Soul is a sentient and matter is a non-sentient substance, and

the two can combine according to defined rules. The soul is a non-corporeal, living, eternal and permanent, and fixed (constant) substance of the Cosmic Universe, having the attribute of consciousness (*Chetana*). Consciousness and *upayoga* (manifestation) are the differentia of the soul. Consciousness is the generality of the attributes that distinguish the soul from the inanimate. Intelligence (*jnana*) and self-awareness or awareness (*darshana*) are agreed to be the two main manifestations of consciousness. Consciousness in mundane souls manifests itself in several ways: intelligence, knowledge, awareness, bliss, perception (cognitive elements), emotions, will, attitude and behavior, and the awareness of pleasure and pain. Life and consciousness are coextensive: wherever there is life there is consciousness and vice versa. Soul and consciousness in Jainism refer to the same entity and each is meaningless without the other.

The mundane soul is in impure state due to its association with karma *pudgala*. The mundane soul exists as a system with other components in the form of the karmic (information) body, fiery (energy) body and gross material body. This impure soul experiences transformation in its state according to the rules of karma and is forced to transmigrate and assume different forms in the living realms. The soul in such existences cannot realize its true nature and is made to suffer in many ways in each birth. The only way to experience natural bliss, the inherent property of the soul, is to remove one's impurities by shedding one's karmic load. Jain philosophy describes the soul in great detail and deals with the methods and process of its purification. The aim of spirituality is to attain the pure state of the soul by terminating its association with the body; the aim of science is to study the body. Jain philosophy describes the relationship between the soul and body also how to meet the spiritual needs of separating these two.

Jainism is known as scientific religion. Why? There are three possible arguments.

1. Jainism, like science, recognizes nature as the fundamental principle and has no need for another supernatural power for its creation, structure and operation. The difference between science

and Jainism is that science recognizes three substances (matter, space and time) in nature while Jainism admits the existence of six eternal substances.

2. In science, changes in the physical world are described by the cause and effect theory. Jainism generalized this principle and stated that it also holds good for living systems. Thus the cause and effect theory is a universal principle and is applicable to all orders of existence. In Jainism, the soul substance is governed by rules in a manner similar to science's rules for matter, although the set of rules for the two substances differ.
3. *Jnana* is a property of the soul. The knowledge of external objects, including body(s), obtained by the manifestation of *jnana* is called *vijnana* (non-soul knowledge including science), which also is a part of the worldly soul. *Vijnana* is *vaibhavik* (other than the self)-*jnana*, but it becomes a big driving force in determining the states of the soul. The working of the mundane soul is guided by both the *jnana* and the *vijnana*; therefore the performance of the soul, religion, is *vaigyanik* (scientific), i.e. influenced by the properties of both the self and the non-self.

Science, including modern science, studies the universe as one consisting of three substances (matter, space and time), at the micro and macro levels. This study, handicapped by factors like distance and the limits of the laws that govern them, is far from complete; new discoveries are being made as new methods and means are devised for study. An entirely new scenario of nature emerges when the number of substances in the universe is increased from three to six, as suggested in Jain philosophy. Out of these three additional substances, the soul substance interacts with matter and substantively changes the way of looking at nature.

As the soul is non-corporeal, the traditional scientific methods of experimentation (in the laboratory) fail to study the combination of soul and matter. A different technique based on direct cognition is needed to access the soul, but this is beyond the scope of science. This subjective method does not have the approval of science, which believes only in

objective methods. Knowledge of the composite structures made by the combination of the soul and matter, i.e. living organisms, is far more complex than the knowledge of matter alone. The true knowledge of such structures is obtained in the omniscient state, so it is beyond verification by the traditional methods of experimentation used by science. This direct method of cognition reveals the true knowledge of Nature, which takes into account all six substances, their interplay and their interactions. It is this knowledge that Jain philosophy presents to us, and it is a treasure for all of humanity.

So we see that science, even assuming that all the laws of (physical) nature will be discovered in the future, shall only constitute a small fraction of the knowledge of the omniscient. Further, it must be noted that the omniscient can express and communicate only a small part of his knowledge; the remaining, vast part is only experienced, i.e. absolute truth can only be experienced and not expressed: such is the nature of truth. Therefore the study of Jain philosophy is rewarding in many ways: it helps individuals to make spiritual progress, to gain insight into the nature of the soul and the composite structure of the soul and matter, and it also helps to overcome the limitations of the scientific method to know more about matter itself, particularly at the subtle level and at distant locations that cause problems in scientific investigations.

Modern science only began about four centuries back. Are there any similarities between Jainism and modern science? Based on the same principle of cause and effect, the two approaches yield many similar results. I have been trying to explore the vast potential and scope of this comparative study of Jainism and science, a challenging task indeed. It is heartening to find that modern science is helpful in making logical interpretations of many of the tenets of Jainism, and on the other hand many tenets of Jainism can help modern science to make a new approach to find answers to some of its unresolved problems. The interaction between Jainism and modern science holds great promise for humankind in finding the ways and means to achieve peace and happiness in life.

One special feature of Jain philosophy is that the propositions of all life principles have a psychic component and a corresponding

physical component. The psychic component is dealt with in detail in the scriptures, but the physical component now needs explanation in terms of modern science. Although such an explanation is not necessary for spiritual attainment, it is very much required for realizing and appreciating the beauty of psychic processes in the modern context. I have studied Jainism from a scientific perspective and have tried to understand the Jaina doctrines in relation to modern science. This approach is reflected in my articles published in journals, magazines and conferences. Much of the matter in this book has been presented in those articles.

A living organism is not merely an integration of limbs and flesh, as assumed by science, but it is the abode of the soul. An organism is a living system consisting of three main sub-systems: the soul, the gross body, and the subtle body. All of these components have their particular properties, but they are interrelated in their functioning. In isolation, no component can completely describe the organism. The performance of the living system can be understood only through a holistic approach studying each component in relation to the other components. The reductionist approach of modern science, which studies the gross body alone, cannot provide information about all aspects of this system. Jainism follows an integrated approach and describes the organism as a system that yields complete knowledge of its working and performance. However, modern science has discovered many details of the gross body which are not available in the Jain scriptures; it is therefore desirable to study the information available in the Jain texts and scientific literature and correlate them to enhance our understanding of the behavior of the organism. The body of a human being is so complex that only a few aspects have been discovered by modern science. For example, it has a strong immune system that protects it from the attacks of bacteria, viruses, the environment, and disorders produced in the body itself. Without this self-healing power, the body could not survive. This is only a tiny indication of the might of the soul; its powers are boundless. With further progress in science we may expect to know more about it, but it is impossible that all aspects of the body shall be discovered by a scientific

approach. It is necessary to take into account the presence of the soul and the subtle body to gain a full understanding of the living system.

Jainism recognizes the place and importance of matter and its influence on life. These influences could be favourable or unfavourable, producing pleasure or pain, respectively. In order to reach the state of permanent bliss, the connection between the soul and matter has to be snapped. This is the main message of Jainism. Reaching the state of omniscience is the end of the journey that is normally suggested to be made quickly through living an ascetic life. The devotee experiences spiritual ecstasy in this journey. There may be another way of making this journey in a slow manner, which offers opportunities to explore the nature in detail. In the first method, one's knowledge explodes from a low level to infinity in a short span of time. The second method consists of pushing the frontiers of *srutijnana* with the help of *matijnana* to higher and higher limits on the way to omniscience; it is only in the very final stage when one may have to take up an ascetic life to jump to the final state of infinite knowledge. This method has its own merit, as it offers chances to serve humanity in various ways during the journey. Although the complete truth is only known in the omniscient state, the knowledge of *srutijnana* is no less powerful. A clear example is the progress made by modern science with the help of *mati* and *srutijnana* and this is likely to continue in future. So in practical life *mati* and *srutijnana* have great significance, although the traditional, direct method of cognition has been given preference in spiritual attainments. It will not be wrong to assume that scientific enjoyment of spirituality is made by the slow mode. Those who wish to proceed in the fast manner may forget about the scientific way, which of course is not essential, and concentrate on the ascetic mode of making the journey.

Proceeding in the slow mode, I am enjoying my journey and deriving the joy of making a scientific enquiry into spirituality. An ascetic may question this way of life, but to my mind this provides an opportunity to promote spirituality in a scientific way that appeals to modern, rational minds.

Some specific questions to know Nature in its many aspects can be asked, such as:

1. A living system being a combination of soul and matter,
 - a. What is the role of matter and what processes take place in the body to structure, operate and maintain the system?
 - b. What is the role of the soul in bodily processes and in the performance of the system?
 - c. What processes take place in the system through the joint efforts of the soul and matter?
2. How do the soul and matter interact in the absence of direct contact?
3. What are the properties of the subtle matter that constitutes the subtle bodies and the physical mind?
4. What is the scientific nature of karma and what is the way of its working?
5. What is the role of the fiery body, *prana* energy, in the working of the gross body and how does it help the system?
6. What is the role and effect of the soul on the universe and natural processes?

This book cannot answer these questions but only addresses some of them partially. However, it does open our mind to an entirely new way of looking at nature, in comparison to the restricted and incomplete view offered by science. A study of this kind, I believe, shall help to make progress in science as well as spirituality. The book starts with a brief description of the soul in Jain and other philosophical systems. Chapter 2 deals with the eleven spiritual doubts raised by the future chief disciples of Mahavira. The doctrine of karma, the central principle of Jainism, and its scientific overtones are discussed in Chapter 3. Chapter 4 presents a model of the soul cognition process and finds logical definitions for terms like intelligence, *buddhi*, *manah*, *ahamkara* and *bhava*. Chapter 5 presents the concepts of psychical and biological intelligence and faculties of the soul and shows how the intelligence of the soul is

manifested in the body. It also suggests possible solutions to some of the observations that are unexplained by biologists. In the next chapter, the soul is presented as the intelligent designer that produces forms of diverse species found on Earth. The source of emotions and *bhava* are discussed in chapter 7. Mind in Jainism is different from the soul. Chapter 8 describes a model of the mind and discusses the interactions between the soul, mind and body. The epistemological performances of living systems and its allied concepts in Western philosophy are described in Chapter 9. Chapter 10 discusses the question of valid and invalid knowledge and presents the modern and Jaina views of manifested intelligence. Modern science is trying to find the source of consciousness in bodily phenomena, particularly neural processes, and advocates quantum approaches to consciousness. These theories are studied in Chapter 11. Chapter 12 describes the path to emancipation as described in Jainism and discusses the scientific view of the method of contemplation. Chapter 13 examines whether the Jain *loka* is a multi-region (or multiverse) structure. The traditional division of *loka* into three parts can be extended to have six major divisions and 22 regions connected with each other but with distinct characters. The scientific universe is assumed to be the middle *loka* of Jainism. The last chapter discusses the fate of the universe and shows that any prediction made on the basis of matter alone may lead to erroneous conclusions like the heat death of universe. A balanced view that considers the presence of both souls and matter leads to a steady, stable and unending universe as described in Jain philosophy.

This is only a preliminary attempt to understand the scientific nature of Jainism. Much more remains to be done by philosophers, scientists, psychologists and medical science. I hope the book shall inspire readers to undertake analytical studies, to further explore Jainism on scientific grounds, and to help integrate science and spirituality.

I am grateful to Prof. Paras Mal Agrawal for writing the Foreword that makes a good addition to the book. My thanks are due to Samani Dr. Chaitanya Prajna, Dr. Pratap Sanchetee and Dr. Surendra Singh Pokharna for reviewing the manuscript and writing their opinions on the book, and to Dr. Dalpat Singh Baya and Dr. R.S. Shah for going through

the manuscript and suggesting some corrections. I am also thankful to authors whose works have been referred to in this book; this has greatly helped in the authentic presentation of this subject matter and the effective blending of Jaina and scientific concepts. My thanks are also due to Mrs. Chelsea McGill for the laborious work of language editing. I shall be failing in my duty if I do not acknowledge the silent support of my wife Sushila, whose cooperation was essential for keeping me occupied with study, writing and compiling ideas that led to giving shape to this book. Lastly, I thank Kundakunda Jñānapīṭha, Indore for publishing this book.

“One who goes deep into spirituality knows the physical world and vice versa,” says Mahavira.

“As an upholder of dualism of self and non-self, Jainism propounded non-absolutism. Knowledge of the self is not complete without the knowledge of the non-self, nor is the latter achieved without the former. The knowledge of both in their completeness is therefore a vital necessity.”

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1

Soul and Consciousness in Jainism and Other Philosophical Systems

1.1 Soul (*Jiva*) in Jainism

In Jain metaphysics the universe comprises six kinds of substances. Two of them, *Jiva* (soul) and *pudgala* (matter), are active substances; the other four, *dharmastikaya* (the passive agent that helps the motion of *jiva* and *pudgala*), *adharmastikaya* (the passive agent that helps the rest position of *jiva* and *pudgala*), *akasa* (space) and *kala* (time), are inactive substances. *Jiva* is sentient and *pudgala* is non-sentient substance, and the two can combine according to defined rules. The smallest indivisible constituent of *pudgala* is *paramanu*; all matter and energy (or any other form of the physical order of existence) in the universe are aggregates of *paramanu*. The *jiva* is found in two states, pure and impure. All embodied souls are impure.

The term *Jiva* connotes that soul is conscious of itself, and consciousness is also invariably soul. The *Jiva* is the non-corporeal, living, eternal and permanent, and fixed (constant) substance of the Cosmic Universe, having the attribute of consciousness (*Chetana*). *Jiva* is the generic name of sentient substance. *Jiva* substance is non-physical and is not sense-perceptible; it does not have the properties of color, smell, taste, or touch. Consciousness and *upayoga* (the manifestation of

consciousness) are the differentia of the *jiva*. *Upayoga* and consciousness are the two sides of the same entity, *jiva*. Consciousness may be interpreted as both a structure and a function of the *jiva*, but *upayoga* refers to the functional side only. *Upayoga* gives us almost the same meaning as “mentally active.” Just as “mental activity” is a fact of mental functioning and “mental capacity” is a fact of mental structure, *upayoga* may be considered a fact of the *jiva*’s function and consciousness or *chetana* may be considered a fact of the *jiva*’s structure.

Consciousness is the generality of the attributes that distinguish the *jiva* from the inanimate. *Upayoga* is the generality of the manifestations of such attributes. Both are comprehensions of the object by the subject. Intelligence (*jnana*) and self-awareness or awareness (*darshana*) are agreed to be the two main manifestations (*upayoga*) of consciousness. This shows that the attributes of intelligence and self-awareness alone cannot be given the status of consciousness in the structure of the *jiva*; these alone do not constitute the differentia of the *jiva*.

Consciousness in mundane souls manifests itself in several ways, including intelligence, knowledge, awareness, bliss, perception (cognitive elements), emotions, will, attitude and behavior, and awareness of pleasure and pain. Life and consciousness are coextensive: wherever there is life there is consciousness and vice versa. But there are degrees of explicitness or the manifestation of consciousness in different organisms. In the lowest class of organisms it is very much latent, while in human beings it is very much manifest. *Jiva* is entirely distinct from inanimate existence, which does not possess consciousness.

Among the many capacities of the (mundane) soul, the main and most comprehensible of all are the capacity of cognition and perception, capacity of energy, capacity of volition or desire, and capacity of attitude of mind or belief. Knowledge is the output of cognition on the manifestation of *jnana*, intelligence; perception is the awareness of an impression formed in a particular context. *Jiva* is endowed with energy, exertion, action, strength, effort and vigor, and it manifests its sentiency by its own state, because, having the inherent attribute of consciousness, the soul attains cognition of infinite modes of all kinds of knowledge and wrong knowledge, self-awareness, etc.

The soul is *jnana* (intelligence), endowed with right knowledge in some respects and also wrong knowledge in other aspects; the *jnana* itself is invariably soul, for consciousness is its inherent quality. Soul is the knower and *jnana* is the means of knowing. Similarly, self-awareness and awareness of outside objects are correlated, because the soul is possessed of the natural capacity of taking note of external objects: it is the knower. It is also invariably self-awareness (*darshana*) and self-awareness is invariably soul itself.

The life-essentials of worldly embodied souls are represented by (up to) five senses; mental, vocal and bodily activities; the duration of life; and respiration. Whatever things or behaviours it makes are reflected in it; one fine material body, called the karma body, contains an impression of these forces and activities, and it exists at the time of forming another body on rebirth.

Jiva, and karmas, made of a special type of *pudgala-skandhas* (*karmanvargana*), are mutually associated. Karma *pudgalas* affect *jiva* in a peculiar way. All the souls in this universe undergo effects such as sorrow, happiness, birth, death etc. as long as they are afflicted by karma-*pudgalas*. The souls who are emancipated from the effects of karma-*pudgalas* are designated as “*Paramatma*” or “*Siddha*.”

Jiva, though conscious and non-corporeal, becomes effectively corporeal on account of association with the corporeal body formed. As to its relation with the body, it is defined that the mundane soul is identical to the body, with the former existing in the latter. Thus the soul is both corporeal and non-corporeal, conscious and non-conscious, living and non-living, and it is of beings and non-beings also. The dimension (*parimana*) of the soul decreases or increases in accordance with the size of the body. This change does not affect the soul’s fundamental substantiality; its basic nature remains unchanged. This is one kind of the doctrine of transformation and also the doctrine of permanence-in-change. The other aspect is variation in the manifestation of the quality or capacity of the soul.

Souls are existent in every iota of space, beginning with one or more countless fractions of it and ending with the whole universe. In other words, if space is divided into countless points, called *pradesas*, the size of a soul can be so small as to occupy one or more of these points of

space; in special cases, of *samudaghata*, the size of a single soul can fill the whole universe. The number of *pradesas* in each individual soul is assumed to be equal to the number of *pradesas* in the Universe, which is countless. There is no place in the universe where there is no existence of souls having either fine or gross bodies.

There are an infinite number of souls in both the mundane and the emancipated categories. In the multitude of souls, the inherent capacity of a soul is accepted as one (i.e. equal to all others); nevertheless, the manifestation of each one is not equal, but it is conditional upon the strength of its efforts (*purusartha*) and other causes. This means that the capacity of soul is one, viz. consciousness, but it manifests itself in and through the different stages. Soul in the absolute sense is imperishable, immortal and impenetrable; no one can cause pain or destruction to it, or can cut it with a sharp weapon or burn it with fire; no weapon can enter into it.

The soul is eternal from the point of view of time and non-eternal from that of the state of existence (*gati*), as studied from its substantial and modal aspects respectively: for it was in the past, is at present and will be in future, and it undergoes a change or transformation from one mode (life) to another.

In a nutshell, the nature of *Jiva* as conceived in Jain philosophy is super sensuous, imperishable, immortal, impenetrable, non-corporeal, eternal and non-eternal, infinite and finite, and dynamic in nature.

In general, the following facts apply to the soul:

1. In embodied existence, soul and body appear to be same, but this is not really so. Body is different from soul.
2. Soul contracts or expands to occupy the space of the body. The same soul can pervade the body of an elephant or an ant. Notwithstanding the size of the body, the number of *pradesas* of soul remains the same (i.e. countless).
3. Soul in the absolute sense is non-corporeal and is recognized by its power of perceiving and knowing objects.
4. Soul is the source of awareness, knowledge, perception, happiness and vitality in a living organism.

5. Being invisible, soul is identified by its ability of cognizance; an embodied soul desires amusement, recreation, pleasure, speech, movement, etc.
6. The karma *pudgalas* attracted by a soul are converted into karma unaided.
7. The thoughts and actions of a soul leave a permanent impression. These impressions are stored in the karma body, which moves with the soul in its journey from one body to another.
8. The bondage of soul and karma is beginning less. Karma can be shed from the soul by practicing austerity and penance. In fact, this is the way to get rid of karma and attain the state of emancipation.
9. Soul is non-corporeal but is embodied due to the impurities caused by karma.
10. All living organisms have similar potential powers and abilities, but every living organism is in a different state of manifestation. The development of the soul is determined by its purifying efforts and other karma-related factors.
11. There is no place in *loka* where soul is not present in either subtle or gross form.

1.2 Soul: The Subject and the Object

In the absolute sense, the soul can only be conscious of itself, because it alone exists in a state of pure singularity. When we say “it is conscious of itself,” we separate the intellectual level of the soul into two aspects: (1) the aspect in which it is the observer and (2) the aspect in which it is observed (although they are one and the same). Intellectual examination, in fact, reveals the existence of three values within consciousness that are inherent in any process of conscious experience or observation: (1) the observer, (2) the observed, and (3) the process of linking the observer and the observed. Even though there is nothing but one consciousness, this principle of three emerges. Consciousness, being awake to it, experiences itself and is at once the knower, the process of knowing, and the known; the observer, process of observation, and the observed; or the subject, object, and the process of linking them. In this

state of absolute consciousness, these three values are one and the same, yet they represent aspects of the same singularity.

It is obvious that every experience requires a subject coming together with an object. This coming together takes place on both the level of attention and the sensory level of perception. When the subject comes together with the object through the process of observation, then this experience occurs: the subject knows the object. Knowledge, therefore, is the result of the coming together of the observer, the process of observation, and the observed.

Since one consciousness leads to three aspects, the interaction between these three, and the resulting aspects and their relationships and interaction, etc., leads to an infinite number of ever-expanding possibilities. All of these possibilities, all of these forces of interaction and relation, exist in the soul.

This interaction of forces, even though it happens within the soul, creates a dissymmetry, a distortion as it were, in the flat and homogeneous – yet infinitely flexible– absolute singularity of soul. The virtual pull and push, rise and fall, vibration and silence, dynamism and silence, leads to the formation of a virtual structure within the soul. This structure is the result of the apparent breaking of the infinite symmetry. With all interactions always taking place in accordance with the fundamental forces that uphold them; this structure is actually the result of the virtual distortion generated by the interaction of forces.

In the pure soul or the soul of an Omniscient this structure is absent, and the subject and object are the same pure consciousness. In the impure soul, the subject is the consciousness and the object is the structure created by the virtual distortion. This structure identifies the perverted state of the soul.

1.3 Relations between Soul and Body

How is the soul related to the body? This needs some explanation, but first the existence of the soul itself must be clarified. The following arguments support the existence of the soul:

1. Self-consciousness is possessed by a living being, as expressed in phrases like “I am,” “I am happy,” “I am sad,” etc. The body does not make such experiences.
2. The doubt about whether “I am or I am not,” and other doubts, curiosity, inquisitiveness, etc., are also generated in the soul and not in the body.
3. The soul is the counterpart of matter (*ajiva*). The existence of a substance without a counterpart cannot be logically supported.

As the soul is non-corporeal, it cannot be perceived or known by the senses, mind and intellect. Its attribute is consciousness, which too is beyond the reach of perception. Consciousness can be known only through its function; it cannot be directly comprehended through sensory perception. Some people’s denial of the existence of the soul may chiefly be attributed to its imperceptibility.

We mentioned above that the soul extends the body. In fact, the soul, being non-physical, has no contact with the body. Rather, the relation with the body is made through karma. The soul is bound with karma, but it has no contact with the karma either. The soul and karma have an association of their essential natures. The soul does not naturally occur without an association with karma: that is, the soul is always in an impure state unless it is purified by special efforts. Was the soul without karma at any time in the past? No: like any other chemical element, the soul is also found in an impure state, impregnated with karma, in nature. New karmas bond to the karma body because of the very nature of the karma *pudgala*, the subtle cosmic matter, which are attracted by the soul’s activities. The processes in the soul (due to its activities) and in the karma body run parallel; the soul experiences modification of its state and there is a corresponding change in the karma body. The soul and karma are always in a state of some kind of equilibrium. The soul becomes free of karma only in the liberated state when all the karma is eliminated by special efforts. Once free, no more karma is bound and the soul is not embodied again. The soul has innumerable *pradesas* and the karmas bond uniformly to each *pradesa*: there can be no *pradesa* of soul without karma.

The body is constituted of cells. The soul *pradesa* and karma extend into each cell. There is life in the body so long as the soul is associated with it; the body is dead when the soul departs. The soul extends into the cells of the body. Our body also contains some hollow spaces and spaces where waste materials like urine and stool are stored. These spaces do not contain cells and the soul does not extend there. The living cells are the medium through which we experience pain and pleasure, because of the presence of the soul; the empty spaces, and dead cells, do not cause any sensation. The sensation of pain and pleasure is made by the soul through karma; in the absence of karma the soul does not have such sensation, and it experiences the bliss that is its natural attribute. It may be mentioned here that if pain is negative excitation of the soul, pleasure is positive excitation and bliss is the state of no excitation.

The physical sense organs, *dravyendrian*, have their counterparts in the soul structure *bhavendrian*, or the psychic senses. The psychic senses are in the form of manifested *jnana* and *darshana* due to the annihilation-cum-subsidence of their respective karma. The physical sense organs are formed by the rise of biological karma, and perform the function of sensing because of the existence of the corresponding psychic sense –that is, the intelligent actions performed by sense organs is due to a manifestation of the *jnana* and *darshana* attributes of the soul or the *upayoga* of consciousness of the soul. The mere existence of organs in a physical form, as in a dead body, cannot perform intelligent actions in the absence of the soul.

The physical sense system has two parts, *nirvriti* and *upakarana*, and each of these has two sub-parts. The sub-parts of *nirvriti* are (a) the outer part, in the form of a physical sense organ, and (b) the inner part, in the form of some soul structure. *Upakarana* assists *nirvriti*. The outer part of *upakarana* is physical, the brain that assists the senses in comprehending the object. The inner part of *upakarana* is again some structural aspect of soul. The physical sense organs successfully work when both *nirvriti* and *upakarana* are functional; in the case of any malfunction, intelligent action cannot be performed.

The psychic senses have two aspects, *labdhi* and *upayoga*. *Labdhi* refers to the potential power of the soul due to the removal or

annihilation-cum-subsidence of knowledge-obscuring karma. *Upayoga* refers to the manifestation of the power of the soul in the removal of the obstructing karma, and it is of two types: one vested with form, *sakara* or plural; and the second formless, *nirakara* or singular. The first refers to *jnana* and the second to *darshana*. So *bhavendrian* essentially means the manifestation of the consciousness of the soul as *jnana* and *darshana* attributes, which are instrumental in the organism's performance of intelligent action.

The power of action of the different senses varies. Vision is the most powerful of all the senses; it can sense even an object that is not very clear. Next in power is the sense of hearing; it can sense a word that is clear. The remaining three senses, taste, smell and touch, are least powerful: they sense objects that become clear by actual contact. Sensual experience takes place when contact is established with an object with at least one sense. In the case of a mental experience, contact with the object is not necessary. In this case the transformation of mental states takes place according to the target subject. The knowledge gained through the senses is further augmented by the mind. Pleasure and pain are experienced both by physical sensing and mental thinking. Generally, experience involves both physical and mental processes. Mental phenomena may or may not involve the operation of the senses, but any sensual activity necessarily involves the mind.

1.4 The Worldly Soul

As stated above, the worldly soul is impure. The presence of impurities in the soul can be explained in a simple manner. When you stand in front of a mirror you see your image. The image is not real, it is virtual; but it appears to be real. When you move away, the image disappears, as the mirror has no arrangement to store the image: in fact, the mirror is only a reflecting surface and it is light that forms the image. In the case of an organism, it is assumed that the soul acts as a mirror. The image of the object is stored in the soul and remains in its memory, even when the object is removed or moves away. This is an example of the use of the sense of sight. The soul has been interacting with the environment with all five senses and the mind, and the images so formed are stored on each interaction. Over the period of time of its life journey, the soul has stored a very large amount of images, which are present as

impurity. The structure created by the collection of these images, known as *bhava* karma, is virtual but it has a real effect on the soul. This simple explanation is for easy understanding; the actual mechanism of the formation of impurities is based on the principle of karma, which is the subject of another chapter.

We need to understand the structure and functioning of the impure soul in a little more detail. Initially, the beginning less soul is in the *nityanigoda* mode (*jivas* in the most elemental life form), having the highest impurity. *Nityanigoda jivas* exist in the bottom-most part of *loka*. This is the inactive state of the soul. At the appropriate time the soul comes out of *nityanigoda* and assumes its active form and thereafter its impurity changes with time due to changes in karmic load. Figure 1.

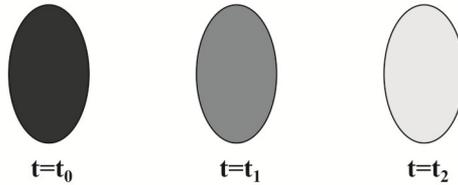


Figure 1: State of impure soul at different times. The intensity of the shade shows degree of impurity.

The impurity, which is also part of the soul, consists of *kashayas* (passions), *ajnana* (ignorance), etc. and exists as some kind of virtual structure that changes with the level of impurity and time. The soul at any instant can be viewed as a composite of pure soul, or pure consciousness, and impurity, or impure consciousness, which is also some aspect of the soul. Figure 2 depicts these two aspects of the soul, with the shaded part representing impurity. The soul and the impurities are co-extensive and occupy the same space, but for the purpose of illustration we have shown the impurity in different sizes to demonstrate its magnitude. It may be noted that impurities are not spatially distinct from the soul and both are non-corporeal.

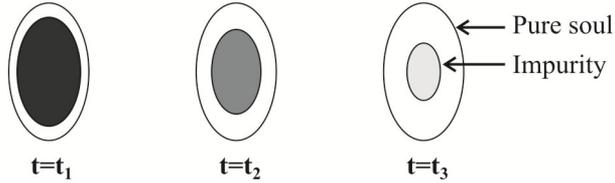


Figure 2: Soul and impurity at different times; the size of the impurity represents its magnitude and the shade represents its quality.

Represents the state of the soul at three different times with different amounts of impurity. The impurity is highest at $t=t_0$, the *nityanigoda* state, and becomes progressively less at $t=t_1$ and $t=t_2$ in its journey.

Technically, these impurities are *bhava* karmas. As karmas shed and the impurities decrease, there is change in quantity as well as in quality. The pure soul, being non-corporeal, is a non-doer: it cannot perform any physical act. The source of all actions, mental, verbal and physical, is the impurities, so the impure soul is regarded as a doer.

There are two ways to describe the existence of the worldly soul:

1. In the first kind of description, no distinction is made between the soul and the impurities. The worldly functions, comprising mental, verbal and physical actions, are performed by the impure soul. The passions are also generated in this soul and these passions lead to the bonding of karma, and changes in the state of the soul. As a result, the impure soul experiences continuous transformation as shown in Figure 1.
2. In the second kind of description, as shown in Figure 2, the soul is separate from the impurities and it is assumed that the pure soul does not undergo transformations in its state: changes take place in the impurities only. This indicates that the pure soul remains unaffected; the source is, and the changes are experienced by the impurities: impure consciousness is the cause of changes and it also experiences the effects of the changes. The passions are generated in the impure consciousness, and they affect the actions of impure soul.

The first kind of description, focusing on the modes of the soul, is called the *vyavaharanaya*, the empirical or relative view. In this

approach, the soul is the doer and experiences the consequences. The second kind of description, focusing on the unchanging soul substance, is called the *nishchayanaya*, or the absolute view. In this approach, the pure soul is considered to be a non-doer and non-experiencer of the consequences; doing and experiencing the results of actions are attributed to the impurities or the impure virtual structure of the soul. It may be noted that both views of the soul are correct; each views reality in a particular way. The second approach helps in understanding that at any instant the pure soul is distinct from its impurity, and when all impurities are eliminated only the pure soul is left, which is the liberated state. However, it must be kept in mind that these impurities could not exist without the soul. Jainism believes that impurities are associated with the soul from the beginning less past, and at no time in the past was the soul without impurities. The second approach may sometimes lead to the erroneous impression that, being non-doer, the soul is not responsible for worldly suffering. Though the pure soul is non-doer, the soul associated with impurities is a doer and performs worldly functions and suffers their consequences. However, the first approach does not mean that the soul is capable of controlling every action of the physical body and mind: some actions originate in physical existence (the *karman* body, *tejas* body, mind and physical body) and some actions in the soul, *bhava* karma. These aspects are discussed in later chapters.

Three states of soul are described in Jainism: *bahiratman*, external soul; *antaratman*, internal soul; and *paramatman*, the supreme soul. Looking outwards, the external soul is not aware of its real existence and in a state of illusion identifies itself with the body, owns the external objects, animate and inanimate, that are in its possession and enjoys worldly pleasures, and pains, through the senses and the mind. The internal soul, looking inward, realizes its real existence, regards the body as external and disowns external objects. It knows that the worldly pleasures experienced through the senses and mind are temporary and that real, permanent pleasure is within. Such a soul makes efforts to remove the impurities that were causing the illusion. The supreme soul has eliminated all of the impurities causing this illusion and has attained its natural state of unlimited bliss and perfect knowledge and perception.

The model presented in Figure 2 helps to define these three kinds of soul. In the case of external soul, the impure consciousness is conscious of its impurities, i.e. both the subject and the object are impurities. The soul is in a state of illusion and identifies itself with the impurities; forgetting the real self, it thinks that this is its real identity. The soul, not conscious of its real existence, identifies with non-soul-like passions, the body, etc. This is the lowest state of the soul this case can be compared with the materialistic view of life in which an organism is considered to only consist of the body, denying the existence of the soul. The (impure?) consciousness, then, is assumed to be an emergent property: it emerges on the combination of the body matter and disappears on death, when the body decomposes. In this view of life, the concept of rebirth and karma is not recognized.

In the case of internal soul, either the impure consciousness is conscious of the pure soul or the pure soul is conscious of the impurities. Both of these possibilities exist in the case of internal soul and either of them can occur at any one time. The soul in this case avoids indulging in malevolent acts, *papa*, and engages in performing benevolent acts and eradicating the impurities.

The supreme soul is conscious of itself all the time, i.e. both the subject and object are the pure soul. The soul knows that the body is different, and since the psychical impurities causing illusion have been removed, there is nothing to stop the manifestation of the natural properties of the soul. In this state, the soul is called *paramatman*. Two types of *paramatman* have been recognized in Jaina texts, *Arhantaparmatman* and *Siddhaparamatman*. *Arahantaparmatman* is an embodied state that still has some minimal biological impurities, but has destroyed all psychical karmas enabling the soul to experience natural bliss and the manifestation of perfect knowledge and perception. *Tirthankara* is *Arahantaparamatman* who, experiencing the absolute truth in all its aspects, teaches his disciples and followers the reality of life and the world and the ways to achieve emancipation. *Siddhaparamatman* is body-less and free from all karmas, and exists as pure *jiva* substance. In this case, the soul is in its natural state and is free from the influences of matter. On reaching this state, the soul will never

have a body again and it experiences all of its natural attributes without any obstruction, forever.

1.5 Souls in Other Systems of Indian Philosophy

Other Indian philosophies also accept the existence of soul, but the concept of soul in these philosophies is not the same as that in the Jain philosophy. Like Jain philosophy, the Samkhya-Yoga system accepts that each individual soul is endowed with beginning less and endless inherent consciousness, that the reality of consciousness is unchangeable permanent, eternal and all-pervading, and those souls are infinite. But it does not admit the soul's capacity for contraction and expansion or that the soul is doer and enjoyer.

The Nyaya-Vaisesika system also conceives of beginning less and endless, infinite soul substances that are distinguished by their differences from the body. However, it does not accept soul as an intermediate dimension, as Jain metaphysics does; this system considers it to be all-pervasive, just like the Samkhya-Yoga system. It does not accept that there are inseparable, inherent, eternal capacities like consciousness in the soul substance; nevertheless, it does accept that knowledge, bliss, pain, desire, hatred, effort, merit and demerit, etc. are the qualities of soul, as its modes. Unlike Jain philosophy, Nyaya-Vaisesika accepts the doer and enjoyer concept in the physically embodied state, when there are inherent qualities like knowledge, desire, effort, etc., but not in the liberated state.

The Upanishads differ in the nature of the soul and the Brahman. Vadarayana composed the text *Brahmasutra* to establish his views on the soul. When Acarya Sankara wrote a commentary on the *Brahmasutra*, etc., and established the doctrine of Maya (Illusion), a reaction started. While others opposed this doctrine, all of them agreed on one point: that the soul has only an illusory existence. It is not real, but at the same time it is also real; the soul, having real existence, is distinct from the body and is permanent. Sankara, not conceding that there is any real existence except Brahman, explains the multiplicity of individual souls as an experience of illusion in practical life. This existence also is not independent of the Brahman. Hence, the distinction between the soul and the Brahman is not real. Madhvacharya maintained the opposite view,

asserting that the soul is not imaginary but real, and that it is also distinct from the Brahman. He believed in the doctrine of infinite eternal souls. Bhaskara and all of the other Acharyas accept the reality of the soul, but only as a modification, an effect or a part of the Brahman. These modifications may be due to the power of the Brahman, but they are not at all illusory.

Lord Buddha denied the permanence of any entity or substance. According to *Pali Pitaka*, the soul is like the momentary combination of mutually undivided feelings, ideas, volitions and other faculties with the pure sensation of general consciousness; i.e. there is no soul apart from feelings, ideas, volitions, etc. However, there were four groups of the Buddhist order, and among them there were many advocates of the doctrine of the eternal soul. Nagarjuna established Sunyavada, the doctrine of essencelessness or voidness of all appearances. The Yogachara School at last established the soul in the philosophy of Vijnanavada.

1.6 Soul in Western Thought

Existence of soul has also been accepted in some Western philosophies, but in different ways.

Socrates and Plato: “Plato, drawing on the words of his teacher Socrates, considered the soul to be the essence of a person, or that which decides how we behave. He considered this essence to be an incorporeal, eternal occupant of our being. As bodies die, the soul is continually reborn in subsequent bodies.”

Aristotle: “Aristotle defined the soul, or psyche, as the essence or definition of a living being, but argued against its existence separate from the physical body. In Aristotle’s view, the primary activity of a living thing constitutes its soul; for example, the soul of an eye, if it were an independent organism, would be seeing (its purpose or final cause).”

St Thomas Aquinas: “St Thomas Aquinas understood the soul to be the first principle, or act, of the body. He considered the soul to be non-corporeal, based on two facts: first, that the intellectual soul is capable of knowing all material things; and second, in order to know a material

thing there must be no material thing within it. The soul had an operation separate from the body and could therefore subsist without the body.”

Immanuel Kant: “Immanuel Kant identified the soul as the “I,” in the strictest sense. “We cannot prove *a priori* the immateriality of the soul, but rather only so much that all properties and actions of the soul cannot be cognized from materiality.” It is from the “I,” or soul, that Kant proposes transcendental rationalization, with the caveat that, if it is to remain practical, such rationalization can only determine the limits of knowledge.”

Judaism: “As mentioned in Genesis, the soul is believed to be given by God to a person by his/her first breath. Judaism also has a concept of purity of body and soul, which requires the avoidance of “unclean” things.”

Christianity

The Old Testament contains the statements “Then shall the dust return to earth as it was and the spirit shall return into God who gave it” and “And the Lord God formed man [of] the dust of the ground, and breathed into his nostrils the breathe of life; and man became a living soul.”

“Most Christians understand the soul to be an ontological reality distinct from, yet integrally connected with, the body. Its characteristics are described in moral, spiritual, and philosophical terms. When people die, their souls will be judged by God and sent to spend an eternity in heaven or in hell.”

Roman Catholic beliefs: “The present Catechism of the Catholic Church defines the soul as “the innermost aspect of humans that which is of greatest value in them, that by which they are most especially in God’s image: ‘soul’ signifies the spiritual principle in man.” All souls living and dead will be judged by Jesus Christ when he comes back to earth. The Catholic Church teaches that the existence of each individual soul is dependent wholly upon God: “The doctrine of the faith affirms that the spiritual and immortal soul is created immediately by God.”

Protestant beliefs: “Protestants generally believe in the soul’s existence, but fall into two major camps about what this means for an afterlife. Some believe in the immortality of the soul and conscious existence after death; others believe in the mortality of the soul and unconscious “sleep” until the resurrection of the dead.”

Seventh-Day Adventists beliefs: “Seventh-Day Adventists believe that the “soul” is a combination of spirit (breath of life) and body, disagreeing with the view that the soul has a consciousness or sentient existence of its own. They affirm this belief through Genesis 2:7 “And (God) breathed into his nostrils the breath of life; and man became a living soul.”

Origin of Soul: “A few of the major Christian theories about the origin of the soul are soul creationism, traducianism and pre-existence. According to soul creationism, each individual soul is created directly by God, either at the moment of conception or at some later time. According to traducianism, the soul comes from the parents by natural generation. According to the pre-existence theory, the soul exists before the moment of conception.”

Islam

There is a hadith reported by Abd Allah in Masud, which states that the soul is put into the human embryo 40 days after fertilization. This version of the hadith is supported by other hadiths recorded by Sahih al-Bukhari and Sahih Al-Muslim. According to the Quran, the Ruh (Soul) is a command from Allah (God).

1.7 Powers of Soul

Samayasaara, written by Acharya Kundakunda, is the most important and widely-respected philosophical work on the soul in Jain literature. In his Sanskrit commentary on *Samayasaara*, *Atmakhyati*, Acharya Amritchandra composed verses of great spiritual value and at the end provided a list of 47 *Shaktiyan* (Powers) of the soul. This short description presents some very important concepts of soul. Dr. Hukum Chand Bharill has written a Hindi commentary on this, which I have translated into English below.

The soul is known and identified through its *jnana* attribute. *Jnana*, a special attribute, is the identifying property of the soul; it is not found in matter (*pudgala*) or in other non-living substances. Hence in order to know soul we must understand *jnana* first. As a substance, *jnana* and soul are one and the same. The question, then, is why a distinction is made between them. This is because the existence of *jnana* can be experienced and proved; the existence of the soul cannot. Soul has infinite intrinsic (permanent) attributes; the other (perverted) attributes of soul, which may exist simultaneously or temporally, though different from *jnana* etc. are not different spatially from them. So a change in one attribute causes a change in other attributes too. The other temporary attributes are also known as the powers of the soul. The *jnana* attribute is the means to establish contact with the self as well as with the external world. Some attributes and powers may seem to oppose each other, but they are properties of the same soul.

We now describe the 47 rising powers and attributes of the soul. These powers are intrinsic to the soul and are not related to karma. The substance of the soul is one with the attributes and powers, and it does not carry the perverted modes of the soul. The 47 powers do include the relatively pure modes of soul, which are produced by *aupsamika* (subsidence) and *ksayika* (annihilation) states and by *ksayopasamika* (annihilation-cum-subsidence) states with right faith. These powers gain prominence in the pure modes of the soul. A question may be raised: when pure modes of soul are included in the powers, why are the perverted modes, which are also modes of soul and which occur in knowledgeable souls too, excluded? The reason is that, although this is a true understanding of the soul, the perverted modes are considered to be the weakness rather than power of the soul. The attachment and aversion, found in the ignorant by mistake and in the knowledgeable by weakness, cannot be said to be aroused by powers; and so the perverted modes are not counted as rising powers. These powers, though distinct in character, are mutually related and influence each other, so much so that their inter-relationship is essential to maintain the given character of the soul. This kind of cooperative interrelationship among powers is a specialty of the soul.

1. Life Power (*Jivatva Shakti*)

The existence of consciousness, which is the distinguishing character of the soul, is due to the life power. The life power is the source of “life” in beings. In the mundane state, food is the external auxiliary cause and age-determining karma is the internal auxiliary cause for the body. Life exists due to this inherent power of the soul. Due to this power, the soul has lived, is living, and shall live forever.

2. Consciousness (*Chiti Shakti*)

Due to the power of consciousness, the soul never becomes a non-living physical substance but remains “soul,” a sentient substance. The power of consciousness distinguishes the soul from inanimate substances; it marks a distinction between the soul and body. The “life” in a living being is just not due to the union of the soul and body, as signified by life power; it exists as a manifestation of the consciousness of the soul. The *Chiti* Power is the property of intrinsic consciousness, which is recognized externally by its life power.

3. Self-awareness (*Drishi Shakti*) and

4. Intelligence Power (*Jnana Shakti*)

The soul makes a formless or general perception by the power of self-awareness and makes the perception of shape, size and particularity by the power of intelligence. The self-awareness and intelligence powers are in fact a manifestation of consciousness, but they have distinct functions.

5. Bliss Power (*Shukha Shakti*)

The bliss power creates, and is identified by, favorable states of the soul; the adverse states create pain. The favorable states are incorporated in the first four powers described above. Adverse states are not a property of the soul; they are created by karma. Right faith and right conduct are included in the bliss power; wrong faith and wrong conduct are the results of karma. The bliss power signifies that real pleasure is intrinsic to the soul: it is found in neither external objects nor meritorious acts. Meritorious acts may lead to temporary pleasure, but permanent bliss is an attribute of the soul.

6. Spiritual Energy (*Virya Shakti*)

The ability of the soul to create and retain its state is due to spiritual energy. A liberated soul (and Arihanta) has infinite perception, intelligence, bliss and spiritual energy as a result of the full manifestation

of these powers. Spiritual energy is not related to the physical power of a being.

7. Almighty Power (*Prabhutva Shakti*)

The soul is almighty, independent and capable of continued uninterrupted existence without any external assistance. All of the infinite attributes and their states are vested with the almighty power.

8. Extension Power (*Vibhutva Shakti*)

The extension power pervades all the powers of the soul (e.g. life power, consciousness power, self-awareness power, etc.) and also allows all of the other powers to pervade each other. This makes the soul an indivisible power unit.

9-10. Power of Omniscience (*Sarva Darsitva and Sarvajna Shakti*)

The power of omniscience is of two types, self-awareness and intelligence. Self-awareness omniscience enables the soul to have a general perception of the entire *loka*, or cosmos; intelligence omniscience enables the soul to have knowledge of all of the objects in the *loka*. These powers are somewhat similar, since the first introductory contact with an object is awareness and its detailed observation is knowledge. A mundane soul first experiences awareness and then knowledge of the object, whereas an omniscient or liberated soul experiences both simultaneously. An omniscient soul is able to perceive and know, in the minutest detail, the entire *loka* and *aloka* (supra-cosmic space), past, present and future, at the same time.

11. Cleanliness Power (*Swachhatva Shakti*)

All objects of *loka* and *aloka* are reflected in the soul at once due to the cleanliness power. Unlike a mirror in which only material objects are reflected, all objects, physical and non-physical, subtle or gross, in all their aspects including all of their properties, are reflected in the soul. The limits of time and distance do not apply to the non-physical soul: all objects far and near, present, past, and future, are reflected equally (i.e. temporal distinctions cease to exist). Just like a mirror, the soul is not contacted or affected in any way when objects of *loka* are reflected in it; both the soul and objects continue to maintain their individual and independent identity. However, this happens only in a pure soul (Arihanta or liberated state). As the cover of karma reduces, the reflective capacity

of the soul increases until it may develop the capability of direct perception – leading to powers of clairvoyance and mind reading in a gradual manner – and ultimately gaining the capacity of total cleanliness power in the Arihanta state. The reflection occurs naturally, without affecting the peace and tranquility of the soul in any way.

Irrespective of karma, the cleanliness attribute is always present in some measure and the reflective power is never reduced to zero. The cleanliness power is also interspersed with all of the other attributes and powers, which, like cleanliness, never become extinct even under the thickest cover of karma. Because of this reflective power and despite reflecting all kinds of objects, good or bad, the soul remains pure and clean; the soul in the Arihanta state does not develop sentient feelings or emotions even if bombarded with insults or abuses.

12. Enlightenment Power (*Prakash Shakti*)

The soul has the power of knowing the self and experiencing the self in all its aspects. This power is called the enlightenment power. When this power is awakened, the soul is no longer dependent on external help to know objects.

13. Power of Non-restrained Growth (*Asamkuchita Vikasatva Shakti*)

The power of non-restrained growth allows the soul to grow and develop unrestrained, without the bounds of space and time. All other attributes of the soul (*chetana*, self-awareness, intelligence etc.) attain their full development in space and time because of this power.

14. Power of Non-interference (*Akaryakaranatva Shakti*)

Due to the power of non-interference, the soul neither becomes a cause for others nor does any external object become a cause for it. The substance and attributes of the soul are intrinsic and have no external cause. External factors have no direct role in the changes in the states of a soul, but they may act as auxiliary causes for it. Similarly, changes in external objects take place due to their own causes and the soul has no role in it. The concept of non-interference is important to understand the changes taking place in the soul, which are caused by the soul itself: there is nothing else, including the body that can cause them.

15. Transformations and Transforming Power (*Parinamya-Parinamatva Shakti*)

Due to the transformation and transforming power the soul perceives external objects, and is cognized by others, without becoming a cause for changes in them. The soul knows the self as well as external objects, and also becomes an object of others' knowledge. Thus the soul knows both the self and external objects, and also knows that others know it.

16. Power of Non-transference (*Tyagopadan Shunyatva Shakti*)

The power of non-transference makes the soul just complete; it is not more or less than that required for its existence. The soul has nothing to add or reject for its complete existence.

17. Power of Subtle Changes (*Agurulaghutva Shakti*)

The soul has the power to make subtle changes without losing its attributes (and character). These changes take place in any of these six steps: infinitesimal, by countless fractions, by countable fraction, numerable times, innumerable times and infinite times, in increasing or decreasing order. Such subtle changes are characteristic of not only the soul but also of other real substances, both physical and non-physical.

18. Power of Creation-Destruction-Persistence (*Utpada-Vyaya-Dhruvatva Shakti*)

The soul experiences continuous changes due to its power of the creation-destruction of modes and persistence of substance. The soul does not need the help of any other object to induce changes in it. The

power of creation-destruction-persistence is also a characteristic of other substances like *pudgala* (matter).

19. Power of Continuity (*Parinama Shakti*)

The creation and destruction (of modes) may produce states of an opposite nature in the soul, but such states maintain a relationship due to the power of continuity, so a substantial permanence is assured. The power of continuity permits the creation and destruction of states, preserving a relation and the essential character of soul.

20. Non-corporeal Power (*Amurtatva Shakti*)

The soul and all its states are non-corporeal due to the non-corporeal power.

21. Powers of Non-doing (*Akartritva Shakti*)and

22. Non-experiencing (*Abhoktritva Shakti*)

The soul in the absolute sense is a non-doer and non-experiencer of acts other than intelligence acts (referring to the acts of the soul in general as described by the term *gyanbhava*), i.e. the soul is the non-doer and non-bearer of acts of attachment and aversion (from the absolute point of view), which are perverted modes and controlled by karma.

23. Power of Inertness (*Nishkriyatva Shakti*)

The soul free of karma is inert: it has no vibrations. The vibration-less state is an intrinsic quality of soul.

24. Power of Constant Pradesha (*Niyatapradeshatva Shakti*)

Soul always has (mathematically) the same number of innumerable *pradesha* (space units), which are equal to the number of *pradesha* in the *loka*. The mundane soul occupies the space of the body: it contracts or expands according to the size of body, but the number of *pradesha* remains unchanged. This is also true for the liberated state, when the volume is supposed to be little less than the volume of the last body possessed by the soul.

25. Power of Confinement to Self (*Svadharmavyapatatva Shakti*)

The soul is confined to itself and does not extend into the body. The soul confines itself to its own attributes and never extends into the

attachment and aversion attributes of karma or in the material and fiery bodies.

26. Power of Common, Special and Common-cum-Special Attributes (*Sadharana - Asadharana - Sadharanaasadharana Dharmatva Shakti*)

Soul has some common attributes (e.g. existence) that are also found in other substances. Soul has some special attributes (e.g. intelligence, self-awareness, bliss, etc.) that are exclusive to soul. Soul also has some attributes that are common to some (not all) non-physical substances (e.g. the non-corporeal power of soul is found in *dharma dravya* but not in *pudgala dravya*).

27. Power(s) of Infinite Attributes (*Anant Dharmatva Shakti*)

Soul has power to possess infinite attributes.

28. Power of Opposite Attributes (*Viruddha Dharmatva Shakti*)

Soul can have attributes of opposite natures.

29. Powers of Being Self (*Tatva Shakti*) and

30. Power of Not Being Non-Self (*Atatva Shakti*)

Due to the power of being self, the soul has attributes of its own substance; due to the power of not being Non-Self, the soul does not have the attributes of other substances. It cannot act and function like matter or other non-physical substances, e.g. *dharma*, *adharmā*, *akasa* (space) and *kala* (time). All changes in soul are confined to its own attributes and forms; it never assumes the attributes and forms of other substances. The soul always bears the attributes of intelligence, awareness, bliss and self-power and does not possess attributes like attachment and aversion.

31. Powers of Oneness (*Aikatva Shakti*) and

32. Multiple-ness (*Anekatva Shakti*)

Soul assumes many different modes and forms, but its basic nature as a substance remains unaltered due to the power of oneness. Further, soul as a substance remains one but assumes different modes (forms) due to the power of multiple-ness.

33-38. Powers of Existence, Non-existence, etc. (*Bhava Shakti, Abhava Shakti etc. Chhaha Shaktiyan*)

- (a) Existence of the present state at this moment is due to the power of existence (*Bhava Shakti*).
- (b) Absence of states other than the present one at this moment is due to the power of non-existence (*Abhava Shakti*).
- (c) The present form shall cease to exist in the next moment due to the power of the non-existence of the existing (*Bhava-Abhava Shakti*)
- (d) A new form of the soul (which does not exist at present) will appear in the next moment due to the power of existence of the non-existing (*Abhava-Bhava Shakti*)
- (e) At any given instant, the soul assumes only that form which can occur as per definite rules. This is due to the power of existence of the exist-able (*Bhava-Bhava Shakti*)
- (f) At any given instant, the soul cannot have a form that cannot occur as per definite rules. This is due to the power of non-existence of the non-exist-able (*Abhava-Abhava Shakti*).

All changes take place in the soul due to the substance of the soul only; no other substance has a role in these changes. The change in the form of the soul follows the rule of karma; such changes are unavoidable and nothing can stop them.

39. Power of Self-Existence (*Bhava Shakti*) and

40. Power of Action (*Kriya Shakti*)

The power of self-existence (*bhava*) refers to the ability of the soul to exist in itself without external interference. It may be noted that the *bhavashakti* described above (number 33a) refers to the existence of states of the soul, whereas this *bhavashakti* refers to the existence of the soul itself. The power of action (*kriya*) refers to the power responsible for (the activity of) the creation of pure states of the soul.

The next six types of powers describe the six ways in which the soul affects such creations. We shall see that the pure states are created by the soul (*Karta-Karaka*), to the soul (*Karma-Karaka*), by the soul (*Karana-Karaka*), for the soul (*Sampradana-Karaka*), from the soul (*Apadana-Karaka*) and in the soul (*Adhikarana-Karaka*). The six act-related factors, *Karaks*, are defined as follows:

- (a) The one who performs the act is *Karta*
- (b) The process of the act is *Karma*
- (c) The means of doing the act is *Karana*
- (d) The beneficiary of the act is *Sampradaana*
- (e) The source “from” which the action originates is *Apadaana*
- (f) The base of the act is *Adhikarana*

41. Karma Power (*Karma Shakti*) and

42. *Kartritva* Power (*Kartritva Shakti*)

Out of the above-mentioned six *Karakas*, the powers corresponding to the first two are:

- *Karma* power: the soul is the object of its own pure states
- *Kartritva* power: the soul is the doer of its own pure states

43. *Karana* Power (Instrument Power) (*Karana Shakti*)

The soul is the instrument in the creation of its own states due to *Karana* power

This principle means that all acts like penance, rituals, merits, demerits, etc are not the main cause of liberation: rather, they are “instrumental” in the elimination of karma.

44. Sampradana Power (*Sampradana Shakti*) and

45. *Apadana* Power (*Apadana Shakti*)

- The soul is the beneficiary of the creation of the pure states (of soul) due to *Sampradana* power
- The soul is the source of the creation of the pure states (of soul) due to *Apadana* power

That is, all acts originate in the soul, for the soul, and for none else. Attributes like intelligence, self-awareness, and bliss belong to the soul for its self-enjoyment. These neither originate elsewhere nor can be transferred to others.

46. *Adhikarana* Power (*Adhikarana Shakti*)

- The soul is the base for its own pure states due to *Adhikaran* power. The soul transforms states in general, and from the mundane state to the liberated state on the total elimination of karma in particular, due to *Adhikarana* power.

47. Power of Ownership (*Sambandha Shakti*)

The soul is the natural owner of the self; it owns no one else and no one else owns the soul. The soul is responsible for its own acts. Generally, the term “ownership” implies that one is the owner of some object other than the self. Here ownership indicates that the soul is master of its own self and is not the property of anyone else; soul is not the master of anything other than the self; it does not own any property. Soul owns its pure states. The soul is a complete and independent self and is not dependent on the external world or on external power for its function.

The above description of the powers of the soul provides a glimpse of the real powers of the soul. The soul possesses powers that manifest in various ways to manage its own states, as well as the body (through karma) in the mundane state –and yet it remains unadulterated and does not contract the properties of matter. The perverted modes of aversion and attachment are counted as weaknesses and not as rising powers of the soul: these karma-based modes disappear on the elimination of karma. The soul and body are exclusive to each other; they transform by their own powers and laws and appear to maintain a relationship by the principle of parallelism; changes in one are reflected in the other without the interchange of either’s attributes. Both soul and body have an independent existence, yet “life” is the result of their combination. The infinite attributes and powers of the soul make “life” in multiple forms and in multifaceted and multi-dimensional aspects possible.

In conclusion, we note that the soul is *achaitanya*-self (possessed of consciousness) having persisting attributes, successive modes and infinite powers and attributes and is never lacking in its primary identifying character: intelligence, self-awareness, bliss and spiritual energy.

1.8 Consciousness

Consciousness, according to Jainism and most other philosophies, is a property of the soul. Consciousness, and hence intelligence, in no case can be a property of insentient matter. The concepts of emergent

property, or epiphenomenon, i.e. that consciousness emerges from matter (or the brain), are fundamentally misunderstood. This materialistic approach stems from the assumption that every truth is empirically verifiable. According to Jainism some truths, including the absolute ones, are only experienced. The universe consists of two kinds of substances, physical and non-physical; the non-physical substances can be verified by inference only and cannot be measured empirically.

Another concept analogous to consciousness is awareness. Awareness is defined as the state or ability to perceive, to feel, or to be conscious of events, objects, or sensory patterns. At this level of consciousness, sense data can be confirmed by an observer without necessarily implying understanding. More broadly, it is the state or quality of being aware of something. In biological psychology, awareness is defined as a human or animal's perception of and cognitive reaction to a condition or event. Awareness may be focused on an internal state, such as visceral feeling, or external events by way of sensory perception. Awareness provides the raw material from which animals develop qualia, or subjective ideas about their experience.

Soul and consciousness in Jainism refer to the same entity and one is meaningless without the other. Jain philosophy describes soul in great detail and deals with the methods and processes of its purification.

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The Eleven Doubts

2.1 Introduction

Bhagvan Mahavira gained omniscience on the tenth day of the dark fortnight of Vaisakha month (the 2nd month of the Indian calendar) on the bank of the river Rajuvalka, after a long period of penance and meditation of about twelve and half years. By a series of unprecedented spiritual efforts, he eliminated all of the psychical karma covering the natural psychical powers of his soul. This resulted in a state of the soul with infinite intelligence, self-awareness, bliss and spiritual energy. A common human soul veiled with psychical karma is possessed of right knowledge as well as wrong knowledge, with ignorance outweighing right knowledge by a large measure. Because of ignorance, the soul is not able to perceive the real truth. When ignorance is eliminated with the annihilation of intelligence-obscuring karma, the intelligence becomes boundless. The intelligence and knowledge of the Omniscient has to be necessarily boundless for ignorance to be absent.

The first public exposition of the omniscience of Bhagvan Mahavira was made in the first Samavasarana (religious congregation), in which eleven Vedic scholars received fully satisfactory replies to their doubts. All of these scholars were renowned exponents of the Vedas but had some doubts regarding the soul, cosmology, etc. that no one could answer. They thought that if great scholars like them were not able to find answers to these questions, no one else could do so. When they came to know that Gods and people were rushing to the *Samavasaran* of Mahavira and not coming to their own *yajna*, the scholars' pride was

hurt. They thought that no scholar could surpass them: hence they decided to test the wisdom of Mahavira by posing their doubts as questions to him. These doubts of the Vedic scholars are also the general doubts of many scholars today, who may find the answers by Mahavira to be very educational.

2.2 The First Doubt – The Existence of the Soul

When the Vedic scholars went to Mahavira, there was no need for them to express their doubts in words; Mahavira knew their doubts by his power of omniscience. Indrabhuti Gautam, along with his 500 disciples, was the first to meet Mahavira. When he reached *Samavasarana*, Mahavira addressed him by his name. Gautama was surprised that Mahavira knew his name, but he thought that Mahavira must know him as a famous scholar. But the next moment Gautama was stunned when Mahavira said, "**Gautama! You have a doubt about the existence of the soul.** You think that if the soul exists it should be visible like other objects; if the soul is invisible like *akasa* its existence cannot be accepted. If someone proves the existence of the soul by inference, it is also not correct because only a visible object can be inferred, like fire after detecting smoke. There is also nothing visible that is connected to the soul which may help in its inference. The existence of the soul can also not be proved by Agama (Scriptures), because experience cannot be the subject of Agama. There is also no one living who has really 'seen' or experienced the soul, and whose words can be taken as a proof of its existence. Then why should people believe in the soul?"

To clear these doubts, Mahavira said, "Gautama! Your doubting the existence of the soul is not right. Your belief that the soul is not directly identified is not correct. You are directly experiencing the soul. Statements like 'I have done,' 'I am doing,' and 'I will do' are a direct indication of the existence of the soul, because the soul and not the body makes such statements. Further, who, except the soul, has the doubt? The fact of your doubting is itself indicative of the soul. If you doubt this inference, then everything in the universe will be doubtful.

"The soul is directly known because its attributes like memory are directly experienced. If the attributes are directly experienced so is the

substratum, the soul. The soul is known by its attributes like intelligence, awareness, etc. These attributes cannot be separated from the object."

Gautama agreed that attributes are not separate from their substratum object, but he also said that it is not right to assume that memory resides in the soul: it could, like weakness, strength, etc. refer to the body (or brain), and there is no need to assume the separate existence of the soul for this.

Mahavira replied that intelligence; awareness, etc. cannot be attributes of the body, since the body, like a pot, is visible and physical – whereas intelligence and other attributes are invisible and non-physical. Hence there must exist a non-physical soul separate from the physical body.

Gautam said, "OK, I accept the existence of the soul in my body, but what is the proof that soul also exists in other bodies?"

Mahavira said, "The same logic also proves the existence of the soul in other bodies."

Mahavira presented some other arguments for the existence of the soul:

1. There must be an authority owning the sense organs. As the potter is the maker of a pot, the soul is the authority of the sense organs.
2. As the body has a form, it must have an authority. Formless objects like clouds have no authority. The soul is the authority of body.
3. The sense organs and passions have the relationship of a raw material and a product, like clay and a pot. As a potter is required to produce a pot from clay, the soul is required to produce passions through the senses.
4. There must be a user of the body, as a man is the user of food. The soul is the user of the body.
5. There is an owner of anything, like a house, that is constructed. In that sense, the soul is the owner of the body.

"The word 'soul,' like the word 'pot,' must have a meaning," said Mahavira.

"Yes, the meaning of 'soul' is body and nothing else," said Gautama.

Mahavira replied, "No, the word 'soul' cannot mean body because the synonyms of 'soul,' like *prani* (being), *sat*, atman, etc. are not synonyms of 'body.' The attributes of the soul and body are different: the soul is possessed of intelligence whereas the body is inanimate. Gautama! You should not doubt the words of the Omniscient as he is free of passions, which are the source of falsity."

Mahavira continued, "The soul is identified by consciousness. Some people believe that the soul is universal like *akasa* and that the same soul pervades the bodies of all beings. This is not correct. *Akasa* is one because it is similar everywhere. Living beings are different and each being is a unique individual. So the souls have an individual identity. The pains and pleasures experienced by each soul are different and cannot be part of one common soul. When one soul is emancipated, the others are not."

Gautama: "If consciousness is the identifying attribute of the soul, then how is the soul individual, as the same consciousness is present in all souls?"

Mahavira: "All souls possess consciousness, but the level of development of consciousness in each soul is different. This, in fact, distinguishes the souls from each other. Thus there are infinite souls in the *loka*."

Gautam: "Even if the souls are infinite, they could be omnipresent."

Mahavira: "The soul is not omnipresent: it extends only through the body it occupies, since its attributes are found only in that body and not beyond. The soul is permanent as well as transient. It transfers from one body to another without changing its basic character. Thus the soul is eternal."

Mahavira continued: "Many people believe that only matter can produce a new article and therefore the soul is a product of matter. This is not correct. A dead body made of matter does not possess intelligence. Intelligence is the attribute of the soul and not of matter. Hence an intelligent soul cannot emerge from matter."

All doubts of Indrabhuti Gautama regarding soul were removed, and he along with his 500 disciples accepted the Order of Mahavira.

2.3 The Second Doubt – Existence of Karma

Agnibhuti, the younger brother of Indrabhuti Gautam, was the next scholar to go to Mahavira. Like Indrabhuti, Mahavira also addressed Agnibhuti by name and said, "**Agnibhuti! You have a doubt about the existence of karma, as it is not directly proved by any means.** This doubt is not correct. I see karma directly and you can also prove it by inference. You experience the result of the fruition of karma as pleasure and pain: on that basis you can infer the existence of karma. Pain and pleasure are products that must necessarily have a cause. As the cause of sprouting is the seed, karma is the cause of pain and pleasure."

Agnibhuti said, "If a visible cause can be found for pain and pleasures, why should one assume an invisible cause for them? We know that sandalwood brings pleasure and snake poison is the cause of pain."

Mahavira replied, "The visible cause also may sometimes be insufficient, because even when visible causes are the same, individual experiences differ. Therefore, the proposition of karma is essential. The karma body exists even prior to the formation of the physical body. Further, when we perform acts like charity, etc. these actions must produce fruits later, like the fruits of sowing seed. These fruits of charity are karma."

Agnibhuti agreed, but posed another question: "As the fruits of agriculture are crops, the fruit of charity can be assumed to be peace of mind. Not granting existence to visible fruits such as this, why should one assume the existence of invisible karma?"

Mahavira replied, "Agnibhuti! Peace of mind is also a kind of action, and like other actions it must also produce fruit. This fruit is karma. The fruition of this karma again produces pain and pleasure in the future and so on."

Agnibhuti: "If the existence of any action is due to a cause, the cause of the physical body must also be physical."

Mahavira: "Yes, I believe in physical karma, as its fruits, like the body, are physical. Further:

1. Karmas are physical, since their association results in the experience of pain and pleasure—as doe's food, which is physical. Any relation of the body with a non-physical thing, like *akasa*, does not produce pain or pleasure.

2. Karma is physical, for its association results in a burning feeling.
3. Karma is physical because it attracts external physical matter, just like a pot smeared with oil attracts dust.
4. Karma is physical since its transformations are different from the transformation of the soul.

“How can physical karma establish a relation with the non-physical soul? See, a physical pot is related to the non-physical *akasa*. In the same way, the physical karmas are related to the non-physical soul. The visible body is physical but we find that it is related to the soul. The transmigrating soul from one body to another must have a relationship with the karma body, in the absence of which the soul cannot form a new body.

“You may ask how physical karma can influence the non-physical soul. We see that non-physical intelligence is adversely influenced by physical things like wine, poison, etc. and is favorably influenced by nourishing food like milk, ghee, etc. In the same way, the non-physical soul is adversely and favorably influenced by physical karma.

“In other words, we may say that the mundane soul is really not non-physical. The relationship between karma and the soul is beginning less, and so the state of the soul determined by karma is also physical. The body and karma have a cause and effect relationship: the body is the cause and karma is its effect; similarly, karma is the cause and the body is its effect.”

Agnibhuti said, "If we assume that God is the cause of this universe, there is no need for karma."

Mahavira: "If we assume that the pure soul or God is the cause of the body and deny the existence of karma, then all such assumptions shall be inconsistent: the pure soul or God (being non-physical) does not have access to karma (the physical power). It cannot be the cause of the body as it lacks the necessary means. As a potter cannot make a pot without a wheel and a stick, God also cannot make a body without karma. Also, if God is impartial and non-physical, he cannot be the maker of the physical world."

All doubts of Agnibhuti were cleared and he, along with his 500 disciples, was initiated into the Order of Mahavira.

2.4 The Third Doubt – Distinction between Soul and Body

Vayubhuti, the youngest brother of Indrabhuti, was the third scholar to reach Mahavira. Addressing him, as before, Mahavira said, "**Vayubhuti! You have a doubt about whether the soul and body are one or different.** You have this doubt because you have not understood the Vedas properly. You believe that consciousness emerges from the combination of earth, water, fire and air. As the property of intoxication is absent in the components of wine but is present in the wine itself, similarly consciousness is absent in earth, water, fire and air but emerges when these components combine (to produce the body). This new property remains in existence as long as the components stay together and disappears on their disintegration. So consciousness is the property of *bhutas* (material existences), and consciousness and the body are not different."

To clarify this doubt, Mahavira said, "Vayubhuti! Your doubt is not right. Consciousness cannot emerge from the combination of material components, as none of them individually possess this property. How can a property that is absent in the components be present in their product? Your assumption that the property of intoxication is absent in the components of wine is not correct: each component has this property in some measure and therefore wine is intoxicating."

Mahavira continued, "Why can't we assume the existence of consciousness, like the ingredients of wine, in each component of the body? No, this is not right. We do not see any sign of consciousness in the components of the body. You may say that there is no need to assume an intoxicating property in each of the ingredients of wine. But in that case anything, like stone, clay, etc. could be valid ingredients of wine, but in practice we find that this is not true. Hence each ingredient of wine necessarily possesses an intoxicating property."

Consciousness is a property of the soul. Explaining this, Mahavira said, "There is an element different from the senses (the material body) that has the property of consciousness, because the element that perceives the objects contacted by each of the senses must be different from the senses themselves. That element, different from the senses, is the soul, *jiva*, or consciousness. You may again say why can't we assume

the senses to be the perceiver? Mind that we continue to remember the object perceived by a particular sense organ even after that organ is destroyed or incapacitated. Sometimes we perceive a thing through a particular sense organ and remember it, and sometimes we forget it even if that sense organ is in order. Therefore we must assume that the senses are not the perceiver; the perceiver is different from the senses. This perceiver is the soul.

“Further, the same object can be perceived by more than one sense, so the perceiver must be different from senses. Sitting in a house, you see the same object through two windows, so the observer must be different from the windows. Similarly, the soul perceives an object through different senses, and so is different from the senses. Secondly, the object is perceived through one sense organ, but its property is sensed through another sense organ. For example, a lemon is seen by the eye but is tasted by the tongue. Therefore the perceiver must be different from the senses. Thirdly, the perceiver remembers the objects perceived through all five senses, so he must be different from the senses.”

Vayubhuti: "Even if the soul is different from the senses, it perishes with the body. What is the advantage in proving it different from the body?"

Mahavira: "This is not a valid doubt. For someone who remembers his previous births, the body is destroyed but there is something (the soul) that is not destroyed. If the soul were also destroyed, then who could remember the previous birth? An old person remembers his childhood because the soul continues to live: so does the soul from birth to birth and remembers his previous life. A soul remembering his past birth must not die.

“If someone says that memories are stored in the brain, then it is obvious that when the body dies the brain should not – if the memories are to be carried forward. Since the brain is also destroyed with the body there must be something else, the soul, that retains the memory. One that is temporary cannot remember the past, and therefore the entity that remembers must be permanent. The soul is eternal and has the attribute

of intelligence, and so it remembers the past. Memories can never part from the soul.”

Vayubhuti: "If the soul is different from the body, why don't we see it entering or leaving the body?"

Mahavira: "There are two kinds of instances of the non-availability or non-observability of a thing: (1) a thing is like the horn of a mule, non-existent; or (2) a thing exists but it is very far away, or very near, or very subtle. The soul is non-physical and the *karman* body attached to it is very subtle, so we cannot see the soul entering or leaving a body."

Vayubhuti was satisfied and he, along with his 500 disciples, accepted the Order of Mahavira.

2.5 The Fourth Doubt—Existence of *Punya* (Merit) and *Papa* (Demerit)

Next Vyakta and his disciples went to Mahavira. Mahavira said, "Vyakta! You have a doubt about the existence of *bhutas*, material existences, because you have not properly followed the Vedas. I shall remove your doubt. **Vyakta! You believe that the visible world is like a dream, and that all invisible elements like the soul, merit (*punya*), demerit (*papa*), etc. are also illusion.** Thus the whole universe is really *shunya*, non-existent. You also think that all phenomena in the world are relative, small or big, and therefore the existence of the real is not proved with respect to the self, others or both. Hence the universe is non-existent. Similarly, no relation of existence, unity, diversity, etc. can be proved in the case of matter, and so nothing exists. Hence the universe must be assumed to be non-existent.

“Your doubts are wrong: because if the world did not exist, then you could not doubt about it. You can raise a doubt only when a thing exists, like a place or a person. So your belief that everything is non-existent is not right. The existence of an object is proved by direct experience, inference or Agama; therefore, we only have doubts about those things whose existence is established by these means. Secondly, doubt is a mode of *jnana* (intelligence), and intelligence is not possible without the knower. Hence for doubt to exist, the existence of a knower is essential.

“Someone may say that if nothing exists there can still be doubt. For instance, a person may doubt that he is an elephant or a mountain in a dream. Therefore doubt can exist even if nothing exists in reality. But this thinking is not right. A doubt in a dream is also based on the memory of past experience. If nothing exists, you cannot doubt even in a dream.

“You see a dream for the following reasons:

1. Your past experience, like bathing, etc.
2. Your past observed objects, like a dog, cow, etc.
3. Your mental thoughts, like your spouse, son, etc.
4. Things you have heard about, like heaven, hell, etc.
5. Physical disorders, like disease, trauma, etc.
6. Favorable or adverse conditions, i.e. pleasure and pain
7. Your emotions
8. Your merit (*punya*) and demerit (*papa*)

“Dream is a reflection of your attributes and is a product of your creation. One of the shortcomings of this theory of non-existence is that it does not distinguish between dream and non-dream, true and false, main and auxiliary, goal and means, cause and action, speaker and speech, for and against an argument, etc.

“Saying that every action is relative, or the existence of no object is established, is not correct. Let us consider whether our knowledge of something as big or small is concurrent or progressive. If concurrent, then we must agree that when we know that the middle finger is big, we simultaneously know that the ring finger is small. In this case, we cannot say that big and small are relative. If the knowledge of big and small were progressive, then we would first know that the ring finger is small; and this perception would be independent of the perception of the bigness of the middle finger. So we have to believe that the perception of big and small is not a relative experience. For instance, when a baby opens his eyes for the first time, how does he perceive sizes? If we know two things simultaneously our perception is not relative. In view of all these cases, we must believe that our knowledge of a given object is not relative to another object. When we remember an object of the past, then we realize that this object is small or big. Therefore we must believe that the existence of objects is self-proven.

“We can prove the existence of matter, etc. If the existence of an object A is relative to the existence of another object B, then when object B is destroyed object A must also be destroyed automatically, since A is dependent on B. But this does not happen. This proves that though the attributes of the object are relative, their existence is independent. Hence there should be no doubt about the existence of earth, water, fire, etc. which are directly visible. Air and *akasa* are not visible and you may doubt their existence. But remember, the property of touch is an attribute of the object. Since air has the property of touch its existence is established. Earth, water, fire and air are physical substances and they require a space for existence, just like the storage of water needs a pot. The substance that holds earth, water, fire and air is *akasa*.”

Clearing the doubts of Vyakta about the *bhutas*, Mahavira continued, "In their natural state, until they are operated upon by some process, these *bhutas* are *sachetan*, i.e. they possess consciousness. They exhibit the properties of a living being. *Akasa* is non-physical; it accommodates *jivas* but is not *jiva* itself. Earth is living as it possesses the attributes of birth, aging, life, death, destruction, recovery, hunger, disease, treatment, etc. that are typical of living beings. The plant Lajwanti contracts on contact. Creepers grow toward trees for support. The plant Shami has been found to have signs of sleep, awareness and contraction. The Vakultree enjoys speech, the Ashoka tree enjoys beauty, the Kurubuck tree enjoys smell, the Virahaka tree enjoys taste, and the Champaka tree enjoys touch. Water is living, as it oozes out of earth like a frog and falls from the sky like a fish. Air travels in a lateral direction like a cow and is therefore living. Fire is also living, as it grows by feeding on fuel wood just like humans grow by consuming food.

“The question is, if earth, plants, water, air and fire are living beings, then are their consumers committing violence? How are the *Shramanas* free from violence? This is because the processed earth, plants, water, air and fire are not living anymore; they become non-living. It is not right to think that a person is guilty of violence when he has killed some living beings and not guilty of violence because he has not killed other living beings. It is also not right to say that killing a few beings is not violence and violence occurs only when killing a large number of beings. The identifying sign of violence is an ill feeling

towards the beings, even if no killing takes place. A person having pure feelings is free of the charge of violence, even if killing has inadvertently taken place.

“A monk observing the five carefulness (*samiti*) and three restraints (*gupti*) is considered free from the charge of violence. But persons living an unrestrained life are not free from the charge of violence. A monk observing restraints in his life is not guilty of violence irrespective of whether violence has taken place, because the basis of the charge of violence is *adhyavasaya*, the vibrations of the soul at that instant and not the act of violence itself. In effect, the ill transformation of the soul is violence. Such ill transformation of the soul may or may not be associated with the killing of another life. Any killing that causes an ill transformation of the soul is surely violence, but that killing which does not induce an ill transformation of the soul is not regarded as violence.”

Mahavira removed all of the doubts of Vyakta on the existence of *bhutas*. Along with his 500 disciples, Vyakta was initiated into the Order of Mahavira.

2.6 The Fifth Doubt – Difference between Past and Present Lives

Sudharma went to Mahavira next. Mahavira addressed him, **"Sudharma! You have a doubt about whether the next life of the soul is similar to the present life.** You have this doubt because you have not properly followed the Vedas.

"The action that follows a cause also becomes a cause for future action. Although it is agreed that the cause decides the action, that does not rule out diversity of action. It cannot be said with certainty that a human being will be born as a human being again in the next birth. The seed for the next life is karma and not the soul. As the karma of each soul is different, different souls are diverse in the next births. Karma is comprised of *puḍgala* (matter) and *karman vargana* (subtle form), and its nature is determined by the behavior of the soul. The attachment and aversion qualities of the soul are the main reasons for this diversity of karma.

"You may say, why should karma decide the next birth? If karma is not the deciding factor, then there could not be a next birth and all efforts

of penance and religious practices for Moksa are likely to go to waste. Further, in the absence of karma the diversity that we observe in life would not exist. Thus ignoring karma raises many questions.

"You may also say that the next birth is decided by the nature of the soul and not by karma. First think: what is the nature of the soul? Is it an object, or the absence of a cause, or is it its attributes? It is obvious that the soul, being inaccessible, is not an object. If it is inaccessible, can it still be assumed to inherit a nature? If so, then what is the objection to assuming the existence of karma in the inaccessible soul? Further, we do not have a cause for the diversity of the nature of beings and the diversity of life except karma. The option that the soul is the absence of a cause also presents many problems. Similarly, the third option (attributes of the soul) does not offer any ground for the diversity of life. When we try to explain this diversity with the help of the effect of matter, it converges to the concept of karma."

Satisfied by the arguments of Mahavira, Sudharma and his 500 disciples accepted the Order of Mahavira.

2.7 The Sixth Doubt –Bondage and Moksa

After Sudharma, Mandika went to Mahavira. Mahavira addressed him, "**Mandika! You have a doubt about bondage and Moksa.** You wonder: if the association of karma with the soul is bondage, then does this bondage have a beginning? If it has a beginning, did the soul exist first and then karma was bonded to it, or did karma exist first and then the soul was born, or did both come into being simultaneously? All of these options are objectionable for these reasons:

1. The soul cannot exist before karma, because if the soul is assumed to be born without any valid reason than it can also be destroyed without any valid reason.
2. Karma cannot exist before the soul, because the soul is the doer of karma. Karma also cannot bond without a reason, since in that case it will have to be assumed that it can also be destroyed without reason. So karma cannot exist before the soul.

3. If both soul and karma are assumed to come in existence simultaneously, then the soul cannot be the doer and karma cannot be the action of the soul.

“The association of soul and karma is also not permanent, because in that case the soul cannot attain Moksa. Anything that is beginning less and endless must also be infinite, like the association of soul and *akasa*.” Clearing these doubts, Mahavira said, “The association of the soul and karma is beginning less because they have a cause and action relationship, like a seed and a sprout. As a sprout is produced from a seed and a seed is produced from a sprout, and as this process is going on from beginning less time, the offspring of both is also beginning less. Therefore, none of these three options about the origin of karma are true. The soul creates the body by karma, so it is the creator of the body, and also creates karma by the body, so it is the creator of karma. The association of the body and karma is beginning less and so is the association of the soul and karma. Therefore the bondage of the soul and karma is beginning less.

“It is not logical that something that is beginning less is also infinite in time. The seed and sprout have a beginning less association, but this association can come to an end. Similarly, the association between the soul and karma can also be brought to an end. This is achieved by right faith, right knowledge and right conduct.” Mahavira then described Moksa and the nature of *bhavya* (capable of Moksa) and *abhavya* (incapable of Moksa) souls.

“The association of soul and karma is terminated by appropriate means. Any product obtained by artificial means is temporary, like a pot. So is Moksa, attained by employing (proper) means, also temporary?” Mahavira clarified, “This rule, that an artificial product is temporary, is forced. The pot, although produced artificially, has the property of transformation. If this transformation property is temporary, then on the loss of the transformation property a broken pot should again revert to its original state. So the transformation, although brought about by artificial means, is permanent. Similarly, though attained by adopted means, Moksa is permanent.” Mahavira then explained the form of emancipated souls and cosmology.

All doubts of Mandik were cleared, and he and his 350 disciples accepted the Order of Mahavira.

2.8 The Seventh Doubt – Existence of Gods (*Deva*)

Following Mandik, Mauryaputra went to Mahavira. Mahavira addressed him, "**Mauryaputra! You have a doubt about the existence of the Gods (*Devas*).** You think that those who live in hell are tied up with chains and are not free: their sufferings are extreme, and so they are not in a position to present them before us. The Gods (in heaven) are free and have unparalleled powers, but they are also not seen here. So you doubt their existence.

"Your doubts can be cleared," said Mahavira. He said, "You at least see the Sun, Moon and the other celestial Gods like the stars, etc. directly. Besides this, you also find instances of happiness and suffering in this world that are inflicted by the Gods. So you must accept the existence of the Gods."

Mauryaputra: "The Sun and Moon are lonely lands; nobody lives there. So how do you say that the sight of the Sun and Moon proves the existence of Gods?"

Mahavira: "The Sun and Moon being living places (*alaya*), somebody must live there; otherwise they would not be living places. You may doubt whether they are living places in the first place. This must be ascertained first. It is just possible that they are not living places but are made of jewels." Mahavira continued, "They are abodes (*vimana*) of Gods just like the *vimana* of Vidhyadhara, made of jewels and moving in the sky. The *vimanas* of the Sun and Moon are not magical productions. Magical products are temporary, but the Sun and Moon are permanent.

"When you accept the existence of hell as the destination for souls committing intense demerit, you should also accept the existence of heaven as a destination for souls committing intense merit. Your question is, If Gods exist and travel everywhere by their own will, why they are not seen in this world? The reason is that they generally continue to enjoy the divine resources of heaven and do not visit this world, which is foul smelling for them. But they do so occasionally.

They visit this world at the time of the birth, initiation, dawn of omniscience and emancipation of Tirthankara. They also come to this land on account of friendship and enmity."

On the alleviation of his doubts, Mauryaputra and his 350 disciples accepted the Order of Mahavira.

2.9 The Eighth Doubt – Existence of the Infernal

Next Akampita visited Mahavira. Addressing him, Mahavira said, "**You doubt the existence of hell dwellers.** Look, there are souls who commit acts of intense demerit. The enjoyers of the fruits of mild and medium demerits are humans and animals, so there must also be some souls that enjoy the fruits of intense demerit: they are the hell dwellers."

Akampita: "Why can't animals and humans enjoy the fruits of intense demerit?"

Mahavira: "Humans and animals do not enjoy the degree of happiness that the Gods enjoy, so they are not heaven dwellers. We do not find a single human or animal who is fully happy or unhappy. So there must be another category of souls, like hell dwellers, who enjoy the fruits of extreme demerit, with little or no happiness."

Mahavira removed all of the doubts of Akampita, so he and his 350 disciples joined the Order of Mahavira.

2.10 The Ninth Doubt –Role of Merit and Demerit in Life

Now Achalbhrata went to Mahavira. Addressing him, Mahavira said, "**You have a doubt about whether merit (*punya*) and demerit (*papa*) exist and have a role in life.**" Clarifying this doubt, Mahavira said, "There are five options regarding merit and demerit:

1. There is only merit, and no demerit.
2. There is only demerit, and no merit.
3. Merit and demerit are the same; there is no difference between them.
4. Merit and demerit both exist and are different.
5. There is nothing like merit and demerit; the nature of being is everything.

"Let us discuss these options.

1. The first option says that only merit exists: demerit does not. As the merit balance mounts, the happiness in life increases. When the merit balance reduces, happiness also reduces. On the complete elimination of merit, the soul is emancipated.
2. In the second case, only demerit exists: merit does not. As the demerit balance increases, suffering increases and vice versa. On the complete annihilation of demerit, the soul is emancipated.
3. Merit and demerit are not different; they are aspects of the same thing, such as the action of a being. When the good part of this action is in greater measure, it is known as merit; when the bad part is greater, it is known as demerit. In other words, when the goodness of an action declines it is demerit and if the goodness of action is present it is merit.
4. Merit and demerit are distinct and independent. Merit is the cause of happiness and demerit is the cause of suffering.
5. The existence of merit and demerit is denied; the soul transmigrates by its nature.

“Out of these five options, only the fourth is logical and true. We experience happiness and unhappiness in relation to the intensity of our merit and demerit. Suffering and unhappiness is not due to an absence of merit, but are due to the fruition of the demerit.” Clarifying further, Mahavira said, "No action can be both merit and demerit. Why? Because the reasons for the bondage of karma are known to be the activities of the body, mind and speech. This activity can be good or bad, not both. So its result is either good or bad: a good result is merit and a bad result is demerit. Both merit and demerit is *pudgala* (karma), physical."

Satisfied with this reply, Achalbhrata and his 300 disciples accepted the Order of Mahavira.

2.11 The Tenth Doubt - Rebirth

Metarya went to Mahavira. Mahavira addressed him and said, "**Metarya! You have a doubt about rebirth.** You do not distinguish between the components of wine and its intoxicating property and similarly disregard any difference between matter (*jada*, body) and soul (*chaitanya*). So to you the concept of rebirth is meaningless and unnecessary. You think that when the components of the body fall apart

(or are destroyed) the *chaitanya* (soul) also loses existence and therefore there is no next birth. This concept remains unchanged even if the existence of a universal soul in place of the individual soul is accepted."

Clarifying these doubts, Mahavira said, "Consciousness is a property of the soul and not of matter (the body), as explained to your friends earlier. Therefore you must accept that the soul is different from the body. It was also made clear before that there are an infinite number of souls in the *loka* and the Gods (*deva*), hell and heaven exist. Hence rebirth is proved. The soul is eternal: it follows the law of creation and destruction of its modes, and continues to exist after bodily death. You must not doubt rebirth and reincarnation."

Metarya's doubt was removed and he and his 300 disciples joined the Order of Mahavira.

2.12 The Eleventh Doubt - Salvation

The last and the youngest Pundit to go to Mahavira was Prabhasa, who was only 16 years old. Mahavira addressed him, "**Prabhasa! You have a doubt about salvation.** Some scholars say that the end of life is salvation, just like a lamp extinguishes on the burning of the oil. Others say that salvation is a special state of the soul, obtained on the removal of sufferings in the form of attachment and aversion. What is correct? The association of the soul and karma is beginning less like *akasa*, and this association is never destroyed. Then where is the question of salvation?"

"Prabhasa! The comparison of life with a lamp is not correct. The light of a lamp is also not destroyed altogether; it only transforms from the light mode to the darkness mode. As milk transforms to curds and, when broken, a pot transforms into a bowl, in the same way, like a lamp, the soul is not destroyed on the death of the body. You may ask, if the light of the lamp is not destroyed altogether, why is it not clearly visible? This is because the light now assumes a finer form, which is not visible to the naked eye. Similarly, when the soul attains salvation its state is transformed permanently to a state of infinite bliss. In this sense, salvation is the state of the soul completely free from suffering.

"It is not right to assume that the free soul is devoid of intelligence (*jnana*). *Jnana* is an inherent property of the soul: the two are never separate. As a *paramanu* cannot become non-physical, the soul cannot be

separated from intelligence. You may ask where the proof that the soul and *jnana* are the same? This is directly established by our own experience. We can also prove the *jnana*-form of other souls by inference. This is because other souls also engage in worldly actions and in salvation activity, which is not possible without *jnana*. Just as filtered light comes from a lamp covered by a screen, the *jnana* from a covered soul comes out through the senses, and which are windows made by *ksyopasama* of knowledge-covering karma. The cover is absent in the emancipated soul and the *jnana* is manifested in its full measure. In this state, the soul knows each and every thing in the *loka*. So the liberated soul has perfect knowledge.

“The liberated soul experiences uninterrupted bliss, but this is sometimes not understood because we believe that happiness is caused by merit and suffering is the result of demerit. Both merit and demerit are absent in the liberated state and therefore there should be neither happiness nor unhappiness. Happiness and suffering go with the body, and in the absence of the body both should also be absent in the liberated state.”

Mahavira clarified: "In fact, the fruit of merit is also unhappiness, and not happiness, as it has its origin in karma. The fruits of karma are always unhappiness; of course, you could also say that the fruits of demerit are also happiness as they also originate from karma. Secondly, being favorable, the fruits of merit are a cause of happiness; how can that be unhappiness?"

Mahavira continued, "This so-called happiness is, in reality, unhappiness. Generally by happiness we mean the opposite of suffering, and it is therefore unhappiness in a real sense. So we should also regard the fruits of merit as unhappiness. For instance, sensual pleasure is not happiness as it stands for the absence of suffering. We treat a disease with drugs, but this treatment and its outcome is also a form of suffering though we regard it as good. In the absence of the happiness of the soul, real happiness is not possible. So the real happiness is experienced only in the liberated state of the soul. This happiness results from the complete elimination of unhappiness (suffering) and the absence of contact with the external world. Thus happiness in the liberated state of the soul is pure and perfect."

Prabhasa was now doubt-free and he and his 300 disciples were initiated into the Order of Mahavira like his other ten friends. These eleven Vedic scholars became Ganadharas (Chief Disciples) in the Order of Mahavira.

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3

Doctrine of Karma

3.1 Introduction

All religions and cultures believe that a person reaps good fruits for his good deeds and suffers in some way for his bad deeds. How does this happen? Can we know the process responsible for it? The answer to these questions is yes. In this chapter we shall attempt to understand this process, known as the Doctrine of Karma, which is the central theme of the Jain religion.

All Indian philosophies that believe in re-birth believe that the records of actions performed in life are maintained in some form, and that these records cause effects in future lives. Such records are known as karma (or *Samskara*). The soul is immortal and is embodied due to karma, which is the cause of the cycle of rebirths. The births of a soul are not temporally independent, but are linked together by karma records. The powers and abilities that the soul enjoys in a particular life depend on its performance in previous births. Therefore, the state of the soul in this life does not come as a surprise; it is a logical outcome of the soul's previous performances.

According to Jain philosophy, the soul is one of the six realities that constitute the universe. The other important reality is matter, both

subtle and gross. A reality or substance has three properties: (1) it undergoes transformation and changes its form, called a *paryaya*; (2) it has the property of destruction, that is, one form is destroyed and another originates; and (3) in the process of transformation and transition, the intrinsic nature of the substance is preserved: its basic characteristic is permanent and is not lost. Such properties are easily evident in physical matter. For example, when a substance changes its form from solid to liquid to gas the chemical composition does not change. So is the case with the soul. The soul leaves one body upon "death" and enters another body according to well-defined rules. Here "death" only implies that the soul leaves the present mode; the soul in fact does not die. The soul is immortal and only changes its form when it enters a new body. In this process, the karmas, which are impressions of the actions performed by the soul, are carried forward to the next body and continuity in the mundane existence of the soul is maintained.

The aim of spirituality is to attain the pure state of *jiva*, soul, and to terminate its association with the body, whereas the aim of science is to study the relationship between *jiva* and the body. The main emphasis of Jain philosophy is on the emancipation of *jiva*, so it only briefly describes the relationship between *jiva* and body. In modern times, *pudgala* has received more attention from scholars and scientists, and the body as a physical entity has been studied in detail. These studies try to explain all processes and phenomena in the body on physical grounds, neglecting the existence of *jiva*. Because impure *pudgala* (*skandha*) is also possessed of powers and is capable of self-organization in a limited way, some success has been achieved in explaining the body's processes and functioning by physical laws. But there are many deeper aspects of the body that defy a purely physical explanation. Jain philosophy asserts that it is the combination of *jiva* and *pudgala* that works in the body; by itself, neither of them can completely explain the structure and functioning of the life unit.

Jiva, being non-physical, is not amenable to direct physical analysis. The connection between the *jiva* and the material body is also not direct, but is made through the karma body. Jain philosophy describes this karma body in detail: its formation and functions, and its role in the formation and functioning of the material body. This knowledge can help to decode the

mysteries of the material body. In this chapter, I briefly survey the potential for and scope of interaction between the karma body and material body and attempt to understand the combination of *jiva* and *pudgala* in a scientific way.

3.2 Bhava Karma and Dravya Karma

There are two types of karma: *bhava* karma and *dravya* karma. As described in Chapter 1, *bhava* karma is the impurity of the soul or impure consciousness, and is non-physical. *Bhava* karma constitutes ignorance, feelings of attachment and aversion, wrong faith, etc. in the mundane soul. *Bhava* karmas are present on every *pradesa* of the soul. These karmas are the impressions of the actions of the soul and exist as some kind of virtual structure in the soul. The impression is the memory of the action, so the soul knows all of the actions performed by him in the past and in all previous lives. The information stored in this memory relates to worldly activities and is therefore a hindrance to self-realization. This is why it is called an impurity that hides the real nature of the soul. *Bhava* karmas are the cause of future modes of the soul.

Bhava karmas have a physical counterpart, *dravya* karma, which is comprised of subtle matter called *karman vargana*. The *dravya* karmas form a body known as *karman* or karma body. Thus *dravya* karmas are the physical records of the past activities of the soul. There is a perfect balance and equilibrium between *bhava* and *dravya* karmas. This balance is dynamic in the sense that a change in one automatically initiates a corresponding change in the other, satisfying the principle of parallelism between the *bhava* and *dravya* karma. It is because of *dravya* karma that the non-physical soul is able to perform physical acts. If all *dravya* karmas were removed by some process (which would also mean the elimination of all soul impurities) the soul would be rendered incapable of performing any physical act. A mundane soul necessarily has to be impure, and these impurities impose limits on the manifestation of the natural powers of the soul. The greater the impurities, i.e. the greater the number of karmas, the lesser amount of power of the soul is manifested. We are all imperfect souls, and our imperfection is a direct function of the amount of our karma.

3.3 Bonding of Karma

A living being is always engaged in some kind of activity, which may be undertaken by the body, speech, mind or some combination of the three. These actions and their accompanying passions induce vibrations in the soul (*bhava* karma). The nature of this vibration depends on the type of action, and the magnitude of the vibration depends on the degree of passion. Two things happen due to vibrations in the soul. First, the karma body vibrates because of the principle of parallelism between the *bhava* karma and the karma body. Second, the vibrating karma body attracts karma *varganas* from its surroundings. Karma *varganas* are a kind of subtle energy assumed to be present throughout the cosmos. The incoming karma *varganas* bond with the existing karma and become part of the karma body. This karma carries the impression of and information about the source action. How long does this karma remain in the karma body? The karma is bonded for certain duration and is shed from the karma body on maturity. The shedding of karma from the karma body is known as karma *vipaka* or *nirjara*.

The process of bonding takes place in the soul and karma body simultaneously. The bonding of new karma means a change in the state of both the soul and the karma body. Do the changes in the two take place concomitantly, or is a change in one immediately followed by a change in the other to maintain the balance? Perhaps the second possibility is true, as shown below.

Passion is the binding force of *bhava* karma, and so also between the incoming *varganas* and the existing karma. If passion were absent or not operative, the incoming *varganas* would not bond, but would exit back to the cosmos without interacting with the karma. The important point is that passions are responsible for karma bonding: the higher the passion, the more karma is bound. Where do the karmas bind in the karma body? Karma binds uniformly to all of the karma *pradesas*. Jain philosophy posits that the soul has innumerable *pradesas*, tiny parts of space: each part is supposed to be like the point of a needle. Truly speaking, the soul is indivisible, but for the purpose of theoretical explanation, it is assumed to contain innumerable points of space. The karma body is also assumed to be divided into the same number of points as the soul. Bonding takes place uniformly so that at any instant each part

of the karma body contains the same amount of karma. The number of bonding karma *varganas* is directly proportional to the intensity of the action and passions, but in any case an infinite number of *varganas* is supposed to bond with the karma body at any one time.

3.4 Karma Bonds

There are four properties of karma bonds. These properties describe the way in which the karma system works.

1. Numerical strength of the bond (*Pradesabandha*). A numerable, innumerable or infinite number of karma *varganas* may bond to each *pradesa* of the karma body and to each soul *pradesa*, depending on the strength of an action. If the strength of the action is low, a smaller number of karmas will bond with each *pradesa*, and so on. The *pradesa* bond means the number of karma *varganas* that bind to each soul *pradesa*. This bonding is uniform over all of the *pradesas*. Why does such a large number of karma *varganas* bond with each *pradesa*? Because only an infinite number of karma *varganas* can obscure the power of the soul. *Pradesa* bonding may take place in the karma body first, followed immediately by a corresponding change in the *bhava* karma.

2. Nature of the karma bond (*Prakritibandha*). There are various types of karma; their nature is defined by the property of the soul that they obscure. There are eight main properties of the soul, so there are eight main types of karma. This is an important subject and is dealt with separately below. This bonding is also supposed to take place in the karma body, followed by a simultaneous change in the *bhava* karma.

3. Duration of the bond (*Sthitibandha*). Karma remains bound to the karma body for a certain duration of time. This duration is determined by the passions that are active in the soul. The passions are of two kinds: (1) passions that are in existence but in a dormant state; and (2) passions that are active and currently participating in soul processes. The strength of the impulse of the active passions is responsible for the duration of a bond: a stronger impulse results in a longer duration and vice versa. Generally, when the soul is less attentive or in an unaware or underdeveloped state, the duration of the bond is less; the duration is more for the opposite conditions. The determination of duration is

supposed to first take place in the *bhava* karma, and the same is immediately reflected in the karma body. The strength of the passion's impulse depends on the state of accumulated passions in the conduct-deluding karma.

The total duration of the bond consists of two parts: passive and active. In the passive period, called *abadhakala*, the karma exercises no effect on the soul. In the active or experience period, the karma manifests and the soul experiences the prescribed effect of the karma (known as the karma's rise). For example, when intelligence-obscuring karma rises, the intelligence and cognizing power of the soul is reduced. When the active period is over, the karma is shed and leaves the karma body. The passive period is not fixed and varies between the minimum and maximum limit. The passive period cannot be less than the minimum limit and cannot be more than the maximum limit. The minimum limit can be one or a few hours, depending on the type of karma, and the maximum limit is a few thousand years (70 *kodakodisagaropama*).

4. Intensity of the bond (*Anubhagbandha*). What is the intensity of the good or bad experience that happens when the karma becomes active? This depends on the intensity of the bond, which is pre-decided by the total amount and quality of passions present in the soul at the time of the karma's bonding. If the quality of the passions is good, i.e. the higher class of passions has been eliminated the soul bonds with only mildly inauspicious karma even in a state of strong active passions. If the quality of the passions is not good, i.e. the higher class of passions has not been eliminated the soul bonds with high-intensity inauspicious karma even when the active passions are mild.

The intensity of this bond is the real power of karma. The other three properties are of marginal value: if the intensity of the bond is low, the intensity of the soul's experience on the rise of the karma shall be mild. This means that the passions are the controlling factors for experiences of the soul.

Karma bonds can also be classified in another way:

1. *Sprista* (Non-adhesive)

When a human being performs a deed in a state of ignorance or unconsciousness, e.g. as one tramples upon ants while walking on the road, he or she is bound by *sprista* karma. This karma is very loose, and

is like a turmeric stain on a newly-woven dry cloth, or like a heap of needles. Just as the stain can be easily removed or the needles in the heap easily separated, *sprista* karma can be easily removed by simple religious rituals like *Michchhami Dukkadam*, seeking forgiveness, or *Pratikramana*, confessing and condemning one's own sins.

2. *Baddha* (Mildly adhesive)

Baddha karma, bound under inevitable circumstances or under compulsion, binds the soul like a turmeric stain on wet cloth or like a bundle of needles tied by a string. The undoing of this knot needs *Prayaschitta*, remorse and expiation under spiritual guidance. A bit more effort in the form of *japa*, etc. unties this knot and eliminates the karma.

3. *Nidhatta* (Super adhesive)

When a human being commits a sin by his or her own will but takes no pride in doing so, he or she binds *niddhata* karma. This karma is like a turmeric stain on an oil soaked cloth, or like a pack of needles that have been oxidized by the effect of humidity. Just as these stains need to be washed away with a detergent and the needles need to be cleansed with kerosene, the elimination of *nidhatta* karma calls for greater efforts in the form of meditation, the chanting of mantras, and penance.

4. *Nikachita* (Quasi-insoluble)

When a human being is not repentant about committing a sin, but on the contrary takes pride in it, his or her soul binds *nikachita* karma. This karma is like a stain of oil paint on a cloth, or like needles that have been deformed and rendered useless by heating them with fire. The elimination of *nikachita* karma is only possible by experiencing its fruits or through severe penance when the human being is in his or her final birth.

One is not bound to pay for the first three kinds of karma, but the fourth kind inevitably has to be paid or eliminated by penance in one's final birth as a human being.

3.5 Types of Karma

Jain philosophy describes eight main properties or attributes of the soul. Accordingly, there are eight main types of karma that obscure these natural properties.

1. Intelligence (or the power of cognition)-obscuring (*Jnanavaraniya*) karma. A pure soul has infinite intelligence; karma obscures and limits the pure and perfect intelligence of the soul. Intelligence is conceptual consciousness and is determinate.
2. Awareness (or perception)-obscuring (*Darshanavaraniya*) karma. This karma restricts the soul's abilities of self-awareness and perception. Awareness is non-conceptual consciousness and is indeterminate.
3. Feeling-producing (*Vedaniya*) karma. A pure soul enjoys infinite bliss. This karma obscures this innate property of bliss and produces feelings of pleasure and pain, depending on the situation. It may be mentioned that bliss is not the same as pleasure, but rather a spiritual ecstasy of the highest order. Feeling-producing karma is supported in its functioning by deluding karma.
4. Deluding (*Mohaniya*) karma. A pure soul experiences the absolute truth, but deluding karma hinders the perception of the truth. This happens in two ways: first, perception and comprehension are obscured so that the truth is not apparent; and second, one's equanimity of conduct is obstructed. The very existence of the soul is doubted or forgotten and all acts and efforts are directed towards the body.
5. Age-determining (*Ayusya*) karma. A pure soul is ageless: it is never embodied. Age-determining karma determines the soul's embodied lifespan in a particular realm, viz., the animal, human, infernal or heavenly modes.
6. Form-producing or Morphological (*Naama*) karma. This karma decides the form of the soul's existence in a particular realm and the structure, outward appearance, etc. of the being. This concept is very general and pertains to all kinds of forms, including all animals, plants, humans, infernal beings and heavenly beings.
7. Status (quality)-determining (*Gotra*) karma. This karma refers to the quality of actions (conduct) in a given mode, including the effects of the (genetic?) inheritance from one's parents.
8. Vitality (or Will Power)-obstructing (*Antaraya*) karma. This karma produces an obstruction in the expression of the vitality of the soul

and causes hindrances in the action of the soul. The form-producing, status-determining and feeling-producing karmas are the auxiliary causes that support the action of this karma.

The karmas are divided into two groups, *ghatin* and *aghatin*, depending on the influence they have over the soul. The former destroys the basic nature of the soul; the latter does not. The *aghatin* karmas determine the biological structure of the organism and its operation; the *ghatin* karmas determine its psychological performance. The two groups are:

1. Psychological (*Ghatin*) Karma. These karmas affect the psyche and inhibit or destroy the fundamental nature of the soul. The intelligence-obscuring, awareness-obscuring, deluding and vitality-obstructing karmas belong to this group. These karmas limit the manifestation of the psychological powers of the soul and are the cause of our imperfections.
2. Biological and Physiological (*Aghatin*) Karma. These karmas concern the physical body and do not cause any harm to the fundamental character of the soul. This group includes feeling-producing karma, morphological karma, status-determining karma and age-determining karma. These karmas keep the soul embodied but allow the manifestation of the natural psychological powers of the soul when the psychological karmas have been eliminated.

The psychological karmas may obscure the nature of the soul either fully or partially. However, it may be mentioned that the fundamental quality of the soul is never fully obscured. If that were the case, the soul would lose its basic character and become as good as an inanimate object. Even the densest and darkest cloud cannot completely obscure the sun; in the same way, any amount of karma cannot obscure the total abilities and powers of the soul.

The effects of psychological karmas can be briefly summarized as follows:

1. Generate the qualities of attachment and aversion like anger, ego, illusion and greed
2. Generate desires, drives, instincts and needs like hunger, sleep, defense (fear), and mating (sex)

3. Determine the level of intelligence, knowledge, wisdom, perception, willpower, and determination
4. Determine faith, philosophical and spiritual qualities
5. Determine personal and social conduct and behavior

Biological karmas, on the other hand, have a wide variety of functions, ranging from the type of realm into which the soul is born to the minutest details of the body. These karmas can produce all possible types of bodies of all species, all possible variations in the bodies of a given species, all features like outer appearance, deficiencies, voice etc., all autonomic and physiological functions, and all structural qualities of the body. Feeling-producing karma may operate at either the mental or bodily level to produce mental- or body-oriented pleasure or pain. The age-determining karmas have a temporal character and may be connected to the *prana* body.

The function of biological karma can be explained with the following example. Suppose that age-determining karma decides that the next birth of a *jiva* shall be as an animal with a particular lifespan. Form-producing karma will determine the type of species in the animal kingdom and the shape, size, appearance, structural details, colour, smell, voice, development, etc. of the body. If the next birth is as a dog, then the breed, exact shape and size, look, colour, overall appearance, etc. are determined by form-producing karma. Whether the dog will live in the forest, in the street, or as a pet will be determined by its status-determining karma. Irrespective of the location, the experience of pain and pleasure shall be decided by its feeling-producing karma. Please note that age-determining karma is bound only once in each lifetime for only one birth, whereas the other three karmas bond for several lives. Therefore the type of species, the status, and the experience of pain and pleasure in the next birth depend not only on what we do in this life but also on what we have done in previous lives.

3.6 Karma Sub-Types

The eight main types of karma are further divided into subtypes; the total number of subtypes is 148. The names written in bold are merit-inducing karmas. Each subtype also varies, allowing for variation in the

degree of the manifestation of the property of the soul it obscures. Thus the total number of karma types is indeed very large. Each type of karma presumably maintains its identity by having a distinct frequency in its active state.

1. Intelligence-obscuring karma has five subtypes:

- (a) Empirical knowledge (*Matijnana*)-obscuring
- (b) Articulate knowledge (*Srutijnana*)-obscuring
- (c) Clairvoyance (*Avadhijnana*)-obscuring
- (d) Mind-reading (Telepathy) (*Manahparyayajnana*)-obscuring
- (e) Omniscience (*Kevalajnana*)-obscuring

These karmas obscure the particular type of intelligence mentioned. The bonding and rise of all five subtypes take place simultaneously.

2. Awareness-obscuring karma has 9 subtypes:

- (a) Ocular awareness (*Chaksudarshana*)-obscuring
- (b) Non-ocular awareness (*Achaksudarshana*)-obscuring
- (c) Clairvoyance awareness (*Avadhidarshana*)-obscuring
- (d) Omniscience(*Kevaladarshana*)-obscuring
- (e-i) Five sleep-related awareness-obscuring (light sleep, deep sleep, sound sleep, exceedingly intense sleep, somnambulistic sleep). These karmas temporarily suspend the soul's ability of awareness; the period of suspension is least in light sleep and longest in somnambulistic sleep, which can be compared to a coma state that may last for years.

Bonding of either all nine subtypes, or the first four and light and sound sleep, or just the first four subtypes, takes place simultaneously. The rise of the first four subtypes with any one sleep takes place concurrently.

3. Deluding karma has two divisions, with a total of 28 subtypes:

- (a) Belief-deluding (*Darshanamohaniya*) karma prevents the innate ability of belief and faith (*shraddha*) in truth. It has three subtypes:
 - i. Wrong belief-deluding (*Mithyatva*) karma: upon fruition of this karma, the soul has faith in non-reality, i.e. it does not know its real nature. In such case, all actions of the soul are guided by karma. The

freedom of the soul in choosing worldly activities eventually results in an unending cycle of rebirth.

- ii. Right/wrong belief-deluding (*Samyagmithyatva-misra*) karma: upon fruition of this karma, the soul has a mixed view.
- iii. Clouded right belief-deluding (*Samyaktvaprakritimithyatva*) karma: upon fruition of this karma, the quality of right belief is not destroyed, but the soul has an unsteadiness, impurity, and/or lack of firmness of ideas. In this case, all actions of the soul are guided by its inner will and the soul is able to annihilate the karma that keeps it embodied in a worldly state. The soul in this state restricts worldly activities and pursues spiritual goals seriously.

In practice, bonding of only wrong belief-deluding karma takes place. The other two subtypes are supposed to come into existence by its division. The rise of the three subtypes takes place separately.

- (b) Conduct-deluding (*Charitramohaniya*) karma destroys one's equanimity of conduct and prevents experiencing the existence of the soul. It has two subtypes:
 - i. Passion (*Kashaya*) karma: anger (*krodha*), ego (*maana*), deceit (*maya*), and greed (*lobha*) are the main passions; these may be of the following four grades, in decreasing order of their effect on the soul:
 - a. *Anantanubandhi*: the strongest passions and the cause of endless transmigration; they prevent faith in reality.
 - b. *Apratyakhyanavarana*: passions that do not allow the soul to awaken its consciousness of even partial abstinence (*Anuvrata*).
 - c. *Pratyakhyanavarana*: passions that do not allow the soul to awaken its consciousness of total abstinence (*Mahavrata*).
 - d. *Samjvalana* (Flaming up): these are the weakest passions that do not allow the soul to awaken its consciousness of *Vitaraga* (a soul free of the properties of attachment and aversion) and, which slightly affect even the totally abstinent monk.

Each of the four passions has these four grades, so in all there are 16 subtypes of passion karma.

- ii. Quasi-passions (*Nokashaya*) karma; these are of nine sub types:
 - a. Laughter (*hasya*)
 - b. Indulgence (*rati*)
 - c. Dissatisfaction (*arati*)
 - d. Sorrow (*shoka*)
 - e. Fear (*bhaya*)
 - f. Disgust (*jugupsa*)
 - g. Male disposition (*purushaveda*)
 - h. Female disposition (*striveda*)
 - i. Hermaphrodite disposition (*napunshakveda*)

These are secondary passions that are milder than the main passions in their effect on the soul, but are nevertheless important in the bonding of karma. They are also multiplying factors, for the effect of the main passions increase significantly in their presence.

4. Feeling-producing karma is of two subtypes:
 - (a) **Pleasure-producing (*Satavedaniya*)**
 - (b) Pain-producing (*Asatavedaniya*)
5. Age-determining karma has 4 subtypes:
 - (a) Incarnation in the animal realm
 - (b) Incarnation in the infernal realm
 - (c) Incarnation in the human realm
 - (d) **Incarnation in the celestial (heavenly) realm**
6. Form-producing karma has 42 subtypes with 93 sub-divisions, as follows:
 - (a) The realms of existence (*Gati*) karma (4) give the soul the shape of an infernal being, subhuman being, human being or heavenly being.

- (b) The genus of being (*Jati*) karma (5): The fruition of the genus of being karma is the reason that the soul incarnates as a one sense (immovable), two-sense, three-sense, four-sense, or **five-sense being** (movable).
- (c) **Body (*Sarira*) karma** (5) decides which of the 5 types of body (gross (*audarik*), protean (*vaikriya*), migrating (*aharaka*), fiery (*tejas*) and karma) the soul will have.
- (d) **Organ and limb (*Angopang*) karma** (3) determines the formation of various primary and secondary organs and limbs at their proper place and of an appropriate size in the body. This has three subtypes: the organs of the gross body, protean body and migrating body.
- (e) Morphology (*Nirman*) karma determines that all organs and parts shall assemble and integrate in a proper way to produce a shape typical of the species.
- (f) Body binding (*Bandhan*) karma (5): The fruition of this karma is the basis for the binding of the atoms and molecules of the five types of bodies to form a homogeneous organic structure of the desired quality.
- (g) **Formation of body (*Sanghat*) karma** (5): The fruition of this karma affects the integration of the united molecules to form a specific structure in the five types of bodies.
- (h) Figure of body (*Sansthan*) karma (6): The fruition of this karma gives the body a definite shape. Considering all kinds of beings, there are six types of body figures:
 - i. **Perfect symmetry all over (*Samachaturastra Sansthan*) karma.**
 - ii. *Nyagrodh Parimandal Sansthan* karma. *Nyagrodh* means fig tree, and *parimandal* means circumference. The fruition of this karma is the cause for the body to be like a fig tree. The body is short and asymmetrical below the navel, and large and symmetrical above it.
 - iii. *Svati Sansthan* karma. Fruition of this karma gives the body a tapering shape: broad and symmetrical in the

lower extremities, but short and asymmetrical in the upper extremities.

- iv. Hunchbacked figure (*Kubjak*) karma. The fruition of this karma gives the body a hunch or a spread up in the middle part.
 - v. Dwarf (*Vaman*) body karma. The fruition of this karma results in a dwarf or short body.
 - vi. Asymmetrical (*Hundak*) body karma. The fruition of this karma gives an asymmetrical or irregular body.
- (i) Firmness of the Joints (*Sanhanan*) karma (6): The fruition of this karma joins the bones of the physical body with one another. There are six types of joint structures:
- i. **Fully adamantine skeleton (*Vajra Rishabh Narach Sanhanan*) karma.** The fruition of this karma produces a structure with interlocking bones on both sides, strengthened with pins and plates. It is very strong structure, like steel.
 - ii. Partially adamantine skeleton (*Vajra Narach Sanhanan*) karma. The fruition of this karma produces a structure with interlocking bones on one side, with half-pin and half-plate or the interlocking of bones with a pin. This structure is also very strong.
 - iii. Unbreakable skeleton (*Narach Sanhanan*) karma. The fruition of this karma gives a structure with interlocking bones on both sides.
 - iv. Semi-unbreakable skeleton (*Ardha Narach Sanhanan*) karma. The fruition of this karma gives a skeleton structure with interlocking bones on one side and pins on the other.
 - v. Riveted skeleton (*Kilika Sanhanan*) karma. The fruition of this karma gives a skeleton structure with riveted bone joints, i.e. pins between two bones.
 - vi. Loose skeleton (*Asamprata Supatika Sanhanan*) karma. The fruition of this karma gives a structure where two bones are bound by skin, sinews and flesh. This is the weakest type of skeleton structure.

There are no bones, veins, arteries, or sinews in the protean body, so it has been described as devoid of joints.

- (j) The body colour (*Varna*) karma (5: black, blue, red, yellow, and white). The fruition of this karma determines the colour of the body, **good** or bad.
- (k) The bodily smells (*Gandha*) karma (2). This karma determines the smell of the body. The smell can be **pleasant** or unpleasant.
- (l) The body taste (*Rasa*) karma (5: sweet, bitter, pungent, sour, and astringent). This karma determines the taste of the full body or of its parts (like fruits or leaves), whether **good** or bad, from among the five types.
- (m) The bodily touches (*Sparsha*) karma (8: cold, hot, smooth, rough, light, heavy, soft, and hard). This karma determines the quality of touch of the body. This touch can be **pleasant** or unpleasant.
- (n) Migration (*Anupurvi*) body karma (4). This causes the *jiva* to migrate in a proper direction from one life to another. The shape of the migration body is similar to the shape of the body left by the soul. (**Migration to celestial and human bodies** is due to merit karma.)
- (o) **Balanced weight (*Agurulaghu*) body karma.** This karma determines the balance of weight in the body. The body is not too heavy like an iron ball, nor too light like a cotton ball.
- (p) **Self-annihilation (*Upaghata*) body karma.** The fruition of this karma provides a body that can harm itself. For example, a stag's horn.
- (q) **Injury to others (*Paraghata*) body karma.** This provides a body that becomes a cause of injury to others. For example, poison in the mouth of a snake, sting in the tail of a scorpion, the paws of a lion, poison in a tree, etc.
- (r) **Warm splendour (*Aatapa*) body karma.** The fruition of this karma provides a body that gives warm radiations. The body itself is not hot, but its radiations produce heat.
- (s) **Cold luster (*Udyota*) body karma.** The fruition of this karma provides a body that gives off cold radiations, such as a glowworm.

- (t) Movement of body (Gait) (*Vihayogati*) karma (2). The fruition of this karma provides movement to the body. The movements are of two types: **graceful** and ungraceful.
- (u) **Respiration (*Uchchhvas*) body karma.** The fruition of this karma enables the body to have respiration, i.e. a respiratory system is properly formed in the body.
- (v) **Mobile (*Trasa*) body karma.** Fruition of this karma provides voluntary mobility to the body. The body will have two to five senses.
- (w) **Non-mobile (*Sthavara*) body karma.** Fruition of this karma provides a body that cannot move voluntarily. For example, earth body, water body, air body, fire body or plant body.
- (x) **Gross (*Badar*) body karma.** This karma determines that the soul will have a gross (visible) body.
- (y) **Micro (*Susksma*) body karma.** This karma determines that the soul will have a body imperceptible to our senses, such as viruses or microorganisms.
- (z) **Developed (*Paryapta*) body karma.** This karma determines that the body is fully developed in respect of the six bio-potentials.
- (aa) **Underdeveloped (*Aparyapta*) body karma.** This karma results in an underdeveloped body lacking in one or more bio-potentials.
- (bb) **Individual (*Pratyeka*) body karma.** The fruition of this karma gives an individual body to the soul.
- (cc) **Common (*Sadharana*) body karma.** The fruition of this karma determines that a body is shared by many souls.
- (dd) **Firm (*Sthira*) body karma.** The fruition of this karma ensures that the organs in the body are stable in respect to shape and size.
- (ee) **Flexible (*Asthira*) body karma.** The fruition of this karma makes the organs in the body flexible. That is, the organs shall be unstable and shall not retain the intended shape and size.
- (ff) **Beautiful (*Shubha*) body karma.** The fruition of this karma produces a body that is helpful for the progress of the soul.

- (gg) Ugly (*Ashubha*) body karma. The fruition of this karma produces a body that is not helpful for the progress of the soul.
 - (hh) **Sympathetic (*Subhag*) body karma.** The fruition of this karma gives an amiable body, which may or may not be beautiful or handsome.
 - (ii) Unsympathetic (*Durbhaga*) body karma. The fruition of this karma gives a non-amiable body, even when it is beautiful.
 - (jj) **Melodious voice (*Sushvara*) body karma.** The fruition of this karma produces a melodious voice in the body.
 - (kk) Harsh voice (*Dushwara*) body karma. The fruition of this karma produces a harsh or ill-sounding voice in the body.
 - (ll) **Suggestive (*Adey*) body karma.** The fruition of this karma produces a suggestive and radiant body, so that its speech meets with approbation and belief.
 - (mm) Non-suggestive (*Anadey*) body karma. The fruition of this karma produces a non-suggestive and non-impressive body that is not acceptable to others.
 - (nn) **Fame (*Yasha Kirti*) body karma.** The fruition of this karma brings fame, honour and glory to the individual.
 - (oo) Notoriety (*Ayash Kirti*) body karma. The fruition of this karma brings notoriety, dishonour and shame (i.e. a bad name) to the individual.
 - (pp) **Tirthankara (Omniscient) body karma.** The fruition of this karma produces a body suitable for omniscience.
7. Status-determining karma has two subtypes:
- (a) **High status or performance (*Ucchagotra*).** *Ucchagotra* karma means that the *jiva* has a special *jati* (caste or race), *kula* (family), power (*bala*), aesthetic appearance (*rupa*), perseverance and zeal (*tapa*), education or scholarship (*sruta*), gain (*labha*), and glory (*aishvarya*). All of these performances are personal and not related to any group. The first two attributes, *jati* and *kula*, are related to the parents. *Jati* is defined by the birthplace and is related to the mother. *Kula* is defined as the family tree and is related to the

father. In modern terminology, *jati* and *kula* can be considered hereditary factors. They may also be related to gene modification in organisms. All of these specialities appear as various kinds of physical abilities and performances. For example, power (*bala*) or having a strong body makes possible physical activities of various types, such as good health, athletics, playing, wrestling, boxing, fighting, dancing, etc. Perseverance and zeal imply an enduring body. Education and scholarship (*sruta*) mean that the person is physically fit (i.e. has a healthy brain) for education, study, research, etc. Gain (*labha*) encourages the person to make physical efforts that will result in material and financial gains. Glory (*aishvarya*) makes the person indulge in activities that bring glory. It is to be emphasized here that *gotra* karma is concerned with the physical aspects of the performance of the *jiva*. However, these performances are also heavily influenced by psychological karma, which controls their mental aspects, and which in some cases may have a prominent role in the *jiva*'s overall performance. A person may enjoy higher *gotra* karma in some respects and lower *gotra* karma in others. These karmas bring a person respect and dignity in life irrespective of their intellect, physical disabilities or family background.

- (b) Low status or performance (*Nichagotra*). *Nichagotra* karma means the opposite of *Uchchagotra* karma. These karmas bring disrespect, condemnation and a bad reputation in spite of wealth, beauty, intellect, and good family background.
8. Vitality-obstructing karma has 5 subtypes:
- (a) Charity-obstructing (*Danaantaraya*)
 - (b) Gain-obstructing (*Labhaantaraya*)
 - (c) Enjoyment-obstructing (*Bhogantaraya*)
 - (d) Re-enjoyment-obstructing (*Upabhogaantaraya*)
 - (e) Willpower-obstructing (*Viryantaraya*)

The bonding and rise of all five subtypes take place simultaneously. The rise of vitality-obstructing karma generates

disinterest, bad health, grief, worry, etc. that creates reasons for the obstruction of acts.

Out of the 148 subtypes, only 120 subtypes really bond in practice. The rest 28 subtypes are obtained by the division of these types and do not bond separately. These include the last two subtypes of right belief-obscuring karma and 26 subtypes of form-producing karma, comprising 5 subtypes of binding, 5 subtypes of body formation, and 16 of the total of 20 subtypes of colour, smell, taste and touch karma, since only one of these karmas bond at a time. Of the belief-obscuring karmas, only wrong belief-deluding karma (*mithyatva*) bonds; the other two are obtained by its division into three types when the soul attains an Enlightened Worldview in the 4th spiritual stage.

Each of the subtypes of karma varies in grade, giving the large range of possible karmas that are the basis of differentiation between individuals and between diverse kinds of living beings. Differences in karma make each individual a unique personality with no parallel in the past, present or future. Each grade of karma corresponds to some power that originates in the soul's consciousness. This means that one consciousness divides into many different kinds of powers in the worldly soul. This statement can be compared to the statement in the Vedic tradition that one universal consciousness becomes many, giving rise to the emergence of all living souls as well as the physical and metaphysical substances of the universe. In Jain philosophy, consciousness divides to produce the diversity of living beings and their body structures, but, although they interact, the universe is independent of the soul.

The karmas can also be classified into groups based on other aspects:

1. “Wholly-obscuring” (*Sarvaghatin*) and “Partially-obscuring” (*Desaghatin*) Karmas.

Omniscience-obscuring karmas obscure pure and perfect knowledge, or the wholeness or fullness of intelligence; the other four subtypes of intelligence-obscuring karma allow the manifestation of a part of soul intelligence in an impure form. That is, pure and perfect knowledge is never possible when the karmas obscuring it are on the rise, but other types of knowledge are possible even when there is some rise of the

karmas covering them. For this reason, omniscience-covering karma is regarded as “wholly-obscuring” (*sarvaghatin*) while the other four subtypes of intelligence-covering karma are considered only “partially-obscuring” (*desaghatin*). Similarly, the karmas that cover pure and perfect awareness are *sarvaghatin*. The five “sleeps” are “wholly-obscuring” in the sense that they cover perception itself, although of course there is some sort of sense consciousness even in the state of sound sleep. There are 20 “wholly-obscuring” karmas: omniscience-obscuring; omniscience-awareness-obscuring; the 5 sleeps; the 12 first passions; and wrong belief. There are 25 “partially-obscuring” karmas: the first 4 intelligence-obscuring subtypes; the first 3 awareness-obscuring subtypes; the last 4 passions and 9 quasi-passions; and the 5 vitality-obscuring, hindrance-causing, karmas.

2. Merit or Auspicious (*Punya*) and Demerit or Inauspicious (*Papa*) Karmas.

By simple definition, the fruition of merit karmas brings a pleasurable state of the soul and the fruition of demerit karmas brings a sorrowful state. All psychical (*ghatin*) karmas destroy the basic nature of the soul and are demerit (*papa*) karmas. The biological (*aghatin*) karmas do not destroy any psychic property of the soul, either wholly or partially. Some of the biological karmas are merit karmas, and others are demerit karmas. The following are the 42 merit karmas (written in **bold** above):

Celestial state of existence, *anupurvi, ayusya*: 3

Human state of existence, *anupurvi, ayusya*, high status, pleasure: 5

Movable, gross, developed, individual body: 4

Firm, beautiful, sympathetic, melodious, suggestive, fame: 6

The five bodies, the three limbs, the best firmness of joints, formation, the best figure, injury to others, breathing, warm splendour, cold luster, balanced body, Tirthankara: 17

Animal *ayusya*, 5-sensed class of beings, good gait, good odour, good colours, good tastes, and good touches: 7

These 42 karmas also show the reward the soul receives for meritorious activities.

3.7 Karma Proportions

The following are the proportions into which the incoming *varganas* are divided at any instant and also the proportions of the total karmas present at any stage of the soul. Feeling-producing karma has the highest proportion among the karmas. The next highest is deluding karma. Next in order are intelligence-obscuring, awareness-obscuring and vitality-obscuring karma, which have about equal proportions. Form-producing karma and status-determining karma have the same proportions and come next. The smallest proportion of karma is age-determining karma. Figure 1 gives a pictorial representation of karma proportions to show the approximate scale. Shown shaded in the background is *bhava* karma; there is an exact fit between *dravya* karma and *bhava* karma. Note that although all karmas actually extend throughout the body, they are shown here in boxes for the purpose of comparison.

3.8 States of Karma

Karmas experience the transformation of their state through the activities of beings. These transformations can be favourable or unfavourable, depending upon the efforts made. This is the principle by which a soul can make spiritual progress.

There are ten states of karma:

1. *Bandha* (Bound Karma). This refers to karma in a bound state. Only impure souls have bound karma; pure souls are free of karma.
2. *Udvardana* (Augmentation). Augmenting the duration and intensity of the karmic matter by means of the special energy of the soul. While bonding new karma, the soul augments the duration and intensity of old karma of the same type.
3. *Apavartana* (Attenuation). By the force of its right knowledge, worldview and conduct or by the special energy of the soul, the soul reduces the duration and intensity of its old karma while bonding new karma. A reduction in age-determining karma commonly takes place, except in the case of hellish beings; souls in their last birth before emancipation (*charamshariri*), *Tirthankara*, emperors (*chakravarti*), and human beings have an age of innumerable years.

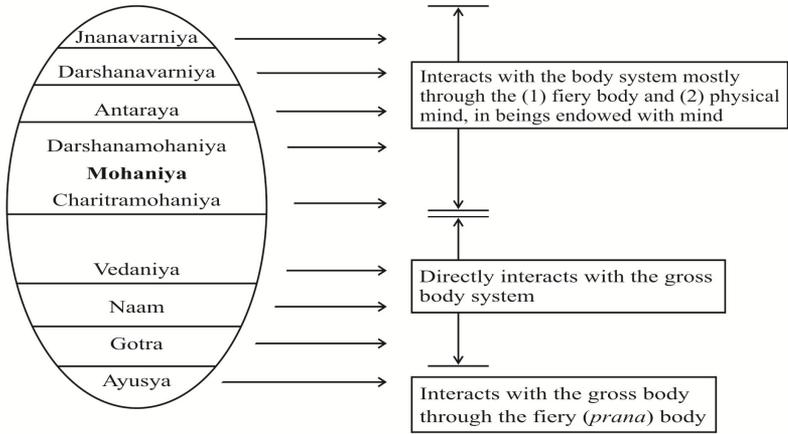


Figure 1 Karma body: The approximate proportions of different karmas and their interaction with the gross body.

4. *Satta* (Existence). This is the time for which the karma exists in bonded form.
5. *Udaya* (Rise). The state when karma starts producing fruits. The fruition of karma and the experience of the effects of rising karma are two different things. Karmas which bond merely by the actions of the body, mind, and speech (without any passions) do not make the soul experience the fruits of their rise. This kind of rise is only a symptomatic rise (*pradeshodaya*). Karmas which are bonded under the influence of the passions make the soul experience their effects: this is called consequential rise (*Vipakodaya*).
6. *Udirana* (Premature rise). The karmic material clusters which have yet not risen are made to rise prematurely by means of special efforts. Normally, premature rise is only possible for karma that is in the process of rising. By this process, the karma that is scheduled to rise and create an intense experience is made to rise prematurely and create only a mild experience.

The principal cause of premature rise is *yoga*, activity of the mind, speech and body. Examples are fasting, *samayika*, fasting with *samayika* (renunciation and remaining in a state of equanimity for 48 minutes), *yoga* exercise (*asana*) and breathing exercise

(*pranayama*), breathing exercise with contemplation, activity of body and mind, recitation (*japa*), activity of speech, recitation and contemplation, activity of speech and mind, self study (*swadhyaya*), contemplation, activity of mind and identification with soul, etc.

7. *Samkramana* (Transformation). Mutual transfer of karmic clusters of the same kind by the special energy of the soul. Such transfer takes place in the nature, duration, intensity and quanta of the karmic mass. For instance, when a person is experiencing the result of pleasant karma, his or her pleasant karma may be transferred to an unpleasant karma if there is a strong rising of an inauspicious karma at that moment. Mutual transfer between empirical knowledge (*matijnana*)-obscuring and articulate knowledge (*srutijnana*)-obscuring karma and between high-status and low-status karma is common.

There are some exceptions to this process of transfer. Transformation can take place between subtypes of the same kind of karma, but one basic type of karma cannot be transferred into another. Mutual transfer is not possible among the four varieties of age-determining karma. Similarly, there cannot be mutual transfer between the subtypes of deluding karma, viz., view-deluding and conduct-deluding karma.

This process involves the mixing of newly bonding karma with old karma of the same nature to produce new, transformed karma. The power of transformation depends on the state of consciousness of the soul: the greater the soul's explicit consciousness, the greater the power of transformation. A very impure soul can hardly affect any transformation.

8. *Upasamana* (Subsidence). A soul can suppress deluding karma from rising and giving fruit by successfully employing the effects of substance, place, time, and emotions. Suppression can be of two types:
- (a) *Antahkarana* (internal) suppression: the rise of karma occurs earlier or later than the prescribed time of fruition.
 - (b) Suppression of karma in the present state: the karmas that are currently in a dormant state are suppressed.

9. *Nidhatti* (Restricted transformation) makes the karmic matter incapable of all processes except the reduction or augmentation of the duration and intensity of karma, by means of the special energy of the soul.
10. *Nikachana* (Non-transformable) makes the karmic clusters incapable of all processes by means of the special energy of the soul. The bonding of *nikachana* karma is due to strong passions. Psychical *nikachana* karmas are more dangerous than biological *nikachana* karmas, with the most dangerous being the *nikachita* wrong belief-deluding karma, which is the helping cause in the bonding of all other karmas.

There are two broad divisions in the nature of the transformation of karmic bondage: first, a loosely-bound karma is transformed into a closely-bound one; second, closely-bound karma is made loosely-bound. Because of evil propensities, the loose state of bondage can become tough and hard; similarly, because of good propensities the tough state of evil bondage can become loose and soft.

3.9 Influx and Bonding of Karma

The influx of karma is caused by the activities of the mind, body and speech and by the passions. Karma is broadly of two types: auspicious and inauspicious.

Auspicious karma that produces feelings of pleasure and the like is called merit (*punya*). The good act of offering food to monks is meritorious; similarly, the offering of drink, shelter, bed, clothes, meritorious thought, words and physical activities, and also homage (to the needy and deserving) are to be considered the nine kinds of merits. The binding of merit is exclusively due to good activity. A good activity, being a means to the attainment of emancipation, is of necessity dharma (penance). Merit is an incidental product that accompanies spiritual purity, exactly as chaff is an incidental product accompanying the kernel, which is the essential product of the seed. By this analogy, even a perverse person doing good activity earns merit and progresses on the path to emancipation. A mundane act unaccompanied by any kind of penance at its source cannot be considered an act of merit. On the other

hand, even acts of physical self-torture by persons of perverted religious faiths can acquire merit, provided that they involve some kind of penance. This is supported by a description of child-penance (*baalatapah*) and its meritorious results in the Jaina canon. Some sort of restraint is a common feature of child-penance although it is done out of sheer ignorance and perverted knowledge.

Inauspicious karma is called demerit. Metaphorically, even those that are the causes are also designated by those terms; as such, inauspicious karma is of 18 kinds: injury to life, falsehood, stealing, sexual activity, possession, anger, pride, deceit, greed, attachment, hatred, quarrel, abuse, backbiting, censure, perverse indulgence in respect to non-restraint and restraint, deceitful-untruthfulness, and the thorn of perverted faith.

Acts of both merit and demerit bond karma. The state of the soul responsible for attracting the karmic matter is called *asrava* (influx), i.e., the cause of the bondage of karma. There are five types of influx: perversity, non-abstinence, remissness, passions and activity.

1. Perversity is mistaken faith that considers non-truth to be truth (due to the emergence of faith-deluding karma). Perversity is two-fold: deliberate and non-deliberate. Non-deliberate perversity is that which is found in the state of ignorance and the like.
2. Non-abstinence means non-renunciation of violent activities and the like.
3. Remissness (*pramada*) means the absence of vigor and enthusiasm in the soul in respect to spirituality.
4. Anger, pride, deceit and greed are the varieties of passion. Each of these varieties has four sub-varieties, according to the variation in intensity and duration as described above. The first entails an indefinite series of birth and rebirth. It affects the soul throughout its series of lives. The second is that which makes a man unfit for the pursuit of vows, even in a partial manner. The third prevents the cultivation of the totality of the vows. The fourth precludes the cultivation of the full course of ascetic life. Like a sudden blast of

wind, it upsets even an ascetic who has succeeded in restraining himself from all sorts of sinful tendencies.

5. Activity means the operation of the body, organs of speech, and the mind. Activity can be auspicious, i.e. good actions, or inauspicious, i.e. bad actions.

The four types of inauspicious influx (perversity, non-abstinence, remissness, and passions) are the causes of demeritorious bondage. Such bondage takes place every moment. The application of the mind, speech, and body to perversity, violent activities, etc. is the external inauspicious operation that becomes the cause of demeritorious bondage, only at the time of operation. Wherever there is auspicious activity, there is, of necessity, the shedding of karma. Thus auspicious activity has two causal functions: both the destruction and the bondage of karma.

The passions are produced by the action of deluding karma, which prevents the manifestation of the innate ability of the soul to believe in the truth and destroys the equanimity of the soul's conduct. This is the most detrimental karma, which obscures the real identity of the soul and produces the untruthful behavior and unscrupulous conduct typical of most humans and other beings. This is regarded as the king of all karmas; the karma bondage caused by it, either by itself or in association with other karmas, is always inauspicious. On its rise, deluding karma produces unpleasant, painful, stressful, and passionate experiences that again cause the bondage of similar karma, thereby perpetuating the cycle. Elimination of this karma is the most difficult task, and only rare individuals who have very strong willpower and determination can do it. Deluding karma is responsible for the duration and intensity of the bond, which varies according to the strength of the passion.

The two attributes of karma bonds (i.e. the numerical strength and nature of the karma) depend on the activities of the mind, body and speech. The karmas that are bonded by these activities can be either auspicious or inauspicious. On fruition, the auspicious karmas produce pleasant experiences, peace and happiness; the inauspicious karmas do just the opposite. The activities of the mind, body and speech are generally associated with some kind of passion, so in reality the bonded karma becomes an inauspicious type. Auspicious karmas bond only

when one has control over the passions. All passions are attributes of the mind: therefore the mind is the major contributor to karma bondage. Activities of the body (alone) can bind only short-term and low-intensity karma.

3.10 Rise of Karma

The bondage and rise of karma is a continuous process. Some activity of the mind, body, or speech generally takes place at every moment, which means that karma is active at every moment. The rise of karma takes place in two ways:

1. Rise of karma on the maturity of the duration of the bonded period (*udaya*, or the rise). The soul experiences the fruits of the rise without any invitation.
2. Rise of karma before its maturity due to the initiative of the soul (*vipaka*, or fruition). This rise is caused by the voluntary action of the soul, and the experiences occur due to its self-initiative.

All karmas cannot be aroused prematurely; only those that have become capable of being aroused prematurely can do so. The criterion for such capability is determined by karmic type, karmic duration, karmic intensity and karmic units.

The fruition and rise of karma is responsible for all worldly life, and therefore its study is of great practical importance, particularly from the scientific point of view. Life exists because of the fruition of karma; to study life, we must know why and how karmas arrive at fruition.

A cause is that which affects the action: action cannot take place without a cause. For any action, there are two types of causes:

1. The Main (*Upaadana*) Cause: the cause that transforms into action. This is also called the substantive cause.
2. The Auxiliary or Efficient (*Nimitta*) Cause: the helping cause for the action to take place, which motivates the main cause. During action, the auxiliary cause does not transform into the main cause and is therefore not destroyed (similar to a catalyst). However, the auxiliary cause influences the main cause.

Auxiliary causes are of two types:

1. Karma is the main auxiliary cause.

2. *Nokarma* is the supportive auxiliary cause in the rise of karma. This again is of two subtypes:
- (a) Bonded *nokarma*, e.g. the fiery and gross material bodies
 - (b) Non-bonded *nokarma* – external objects like family members, contacts, wealth, property and society, or geological, climatic and environmental conditions

The *jiva* and karma have a relationship in which each is both the main cause and the auxiliary cause, i.e. the soul transforms by its own cause as well as by the effects of karma, and karma changes by its own cause as well as the activities of the soul.

Generally, the fruition of karma takes place on meeting a *nimitta*. If karma is strong, a *nimitta* presents automatically before you. The rise of *nikachana* karma is independent of *nimitta*: it will rise irrespective of *nimitta*. *Purushartha* is supposed to enable the soul to fight the karma. This generally consists of changing the *nimitta*, which also changes the fruition of the karma.

The bondage of karma is important from a spiritual point of view, but the fruition of karma is important from a scientific point of view. Fruition can take place on the self-initiative of the soul or on the soul meeting with one or more auxiliary causes, *nimitta*. *Nimitta* can be internal, such as the impurity of the soul itself, or a living or non-living external object with which the *jiva* interacts. The fruition of karma is a regular process; it may take place due to one or more causes, both internal and external. One or more types of karma, up to all eight kinds, can experience fruition at the same time.

The following are examples of *nokarmas* for different types of karma. Please note that the *nokarmas* of psychical karmas prevent the manifestation of the soul's powers and support the powers of the karmas whereas the *nokarmas* of biological karmas promote yoga, the activities of mind, speech and body.

Karma

Intelligence-obscuring
Awareness-obscuring
Feeling-producing

Nokarma

Covering and shielding of objects
Obstruction in the view of objects
Any object that hurts

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Deluding karma	Intoxication or anything that deludes mind
Age-determining	Food
Form-producing	Body
Status-determining	State, high and low, of the body
Vitality-obstructing	Storage of goods preventing their enjoyment; obstructions caused by mountain, river, and male, female individuals, etc. in enjoyment.
Empirical knowledge-obscuring	Covering and shielding of objects
Articulate knowledge-obscuring	Senses and their subjects
Clairvoyance, mind-reading- Obscuring	Objects that produce worries
Omniscience-obscuring	{Nothing can prevent its rise}
Five kinds of sleep	Sleep-inducing objects and food
Ocular, non-ocular awareness- Obscuring	Covering and shielding of objects
Pleasure-producing	Favourite dishes, goods
Pain-producing	Dishes harmful to health
Right belief-deluding (<i>Samyaktva</i>)	Temples, images & pictures of Lords, etc.
Wrong belief-deluding (<i>Mithyatva</i>)	Temples, images, pictures, books, preachers, penances, efforts, etc. of wrong type
<i>Anantanubandhi passions</i>	Temples, images, pictures, books, preachers, penances, efforts, etc. of wrong type
Other three grades of passions	Bad company, bad literature, etc.
Laughter quasi-passion	Joker, comedian
Indulgence quasi-passion	Virtuous son, dear objects
Dissatisfaction quasi-passion	Parting with objects of liking and meeting with objects of dislike
Sorrow quasi-passion	Parting with objects of liking, death of a family member

Fear quasi-passion	Meeting ferocious animals, enemies, criminals, terrorists, etc.
Disgust quasi-passion	Condemned objects
High and low status determining	Company of good and bad persons
Willpower-obstructing karma	Poor and harmful food producing weakness

The fruition of karma is associated with activity (mental, verbal or physical), and one or more activities may take place at a time. These activities, known as yoga, are also accompanied by passions. Mental activities exist as thought processes, memory recall and interaction with the brain. Verbal action may be spoken words, murmuring, mental recitation or speaking activity in some form. Physical action can be motor actions or the movement of limbs and body parts, or biological process taking place in the body. The activities of the *tejas* body also constitute physical actions.

The fruition of karma has four divisions according to how fruition takes place:

1. Fruition in space (*ksetra-vipaki*). Truly speaking, all fruition takes place in space, but some karma subtypes are specially placed in this category. The *Anupurvinaama* karmas are of this type because they obtain fruition during the migration of the soul from one life to the next. Presumably the fruition of these karmas provides the necessary force for the *jiva* to maintain its form when moving from the present location to the next location.
2. Fruition in *jiva* (*jiva-vipaki*). The *jiva-vipaki* karma subtypes obtain fruition in the soul directly, i.e. fruition first takes place in the *bhava*-karma and is simultaneously followed by the fruition of *dravya* karma. The following 78 subtypes belong to this category:
 - (a) All *ghatin* karma – 47 subtypes
 - i. Intelligence-obscuring karma -5 subtypes
 - ii. Awareness-obscuring karma -9 subtypes
 - iii. Deluding karma -28 subtypes
 - iv. Obstructing karma -5 subtypes

- (b) *Aghatin* karma – 31 subtypes
- | | |
|-----------------------------------|--------------|
| i. Status-determining karma | -2 subtype |
| ii. Feeling-producing karma | -2 subtypes |
| iii. Form-producing karma | |
| 1) Tirthankara <i>naama</i> karma | -1 subtype |
| 2) Mobile being karma | -3 subtypes |
| 3) Immobile beings | -3 subtypes |
| 4) <i>Subhag</i> type karma | - 4 subtypes |
| 5) <i>Durbhag</i> type karma | - 4 subtypes |
| 6) Respiration karma | -1 subtype |
| 7) Genus of being karma | -5 subtypes |
| 8) Realm of existence karma | -4 subtypes |
| 9) Movement (gait) karma | -2 subtypes |
3. Fruition in a particular realm of existence (*bhava-vipaki*). Age-determining karma belongs to this category. These subtypes obtain fruition in the next birth.
4. Fruition in the body (*pudgala-vipaki*). These karmas consists of subtypes of body-forming karma; their fruition takes place directly in the body. This fruition determines the structural and functional aspects of the body. Gommatsara Karmakanda mentions 62 subtypes in this category:
- (a) Morphology, firm body, flexible body, balanced weight, beautiful body, ugly body, fiery body, karma body, body colour (5), body smell (2), body taste (5), body touch (8)
 - (b) Body binding (5), formation of body (5)
 - (c) Figure of body (6), firmness of joints (6), gross body, protean body, migration body, organ and limbs (3)
 - (d) Self-annihilation, individual body, common body, cold luster, warm splendor, injury to others.

The above division of karmas is of special significance. It shows that the fruition of all *ghatin* karma takes place directly in the soul and influences its natural ability and performance. Further, the fruition of

some other karmas, such as status-determining karma, feeling-producing karma and some form-producing karmas, also directly affect the soul. The *puḍgala-vipakī* form-producing karmas (which obtain fruition directly in the body) are very likely related to the bio-photonemissions discovered by science, since both of these concern processes taking place in the body.

Physically, the fruition of karma means the irradiation of the karma body that exists in some plasma-like form. Karmas of different types give different kinds of radiations that interact with the gross body in the above manner. An entity known as *dravyamaṇah* or conscious mind, the counterpart of *bhavaṃamaṇah*, exists in all human beings and has a great influence on all types of activities. The conscious mind regulates the activities of thinking, speaking and physical (both biological and motor) actions, according to the beliefs, norms, procedures and habits stored in the memory. The conscious mind, in turn, is influenced by the fruition of karmas. When sleep karmas are on rise, the working of the conscious mind is suspended temporarily. In the state of sleep, mental and physical activities loose regulation and may take place in an arbitrary manner, escaping from the paradigm of accepted beliefs and norms. This happens in dreams in which *jīva* experience unthought-of sequences of events without any conscious effort. These experiences may consist of non-sensible events, uncensored reflections of the unconscious mind (karma body) or desires stored in the memory, current tasks of the conscious mind, or even problems the *jīva* has been trying to solve. In the dream state, the activities of *jīva* can be mental or physical or both. Mental activities take place in the form of the perception of events. Physical activities may consist of some processes like weeping, laughing, uttering words and sentences, walking or doing some act unconsciously, acts like anger or other emotions, discharge, etc.

In the waking state, the conscious mind controls all mental and physical activities, so these activities are organized and purposeful. This is achieved by the choice and selection of *nimitta*, both internal and external. This means that the conscious mind has a regulatory function in the fruition of karma; the fruition of karma is not entirely arbitrary. Of course, *nikachita* karma has no control over the conscious mind and the *jīva* has to experience the fruits of its rise. *Upashaman* is an important

method of controlling the fruition of karma; this allows the *jiva* to change the selection of *nimitta* and temporarily postpones the fruition of karmas that were otherwise due for fruition. It may be noted that the fruition of karma and choice of *nimitta* are mutually dependent: which one occurs first depends on the circumstance. Sometimes the fruition of karma leads to a choice of *nimitta* and sometimes it is the other way around. In any case, the two are closely interrelated and mutually influence each other.

The following are the possible effects of the rise of karma.

1. *Jnanavaraniya* karma. In spite of curiosity the soul fails to know the subject. Its sensual perception is veiled.
2. *Darshanavaraniya* karma. The soul fails to become aware, in spite of being alert, of a subject that is in sight. Either its sensual perceptions are blocked or it goes into a state of sleep.
3. *Satavedaniya* karma. The soul experiences pleasure in the form of words, sight, smell, taste, or touch of favourable mental, verbal or bodily conditions.
4. *Asatavedaniya* karma. The soul experiences pain. This could be in the form of unpleasing words, sight, smell, taste, or touch, or adverse mental, verbal or bodily conditions.
5. *Mohaniya* karma. The soul experiences a perverse state and fall in character. It can suffer from perverseness, a lack of righteousness, or both, or the attack of passions and quasi-passions.
6. *Ayusya* karma. The soul takes birth in a particular form. These forms could be as infernal beings, heavenly beings, animals or human beings.
7. *Shubhanaama* karma. The soul experiences higher physical and verbal conditions. It may have superior speech, looks, smell, taste, touch, movements, position, beauty, fame, physical strength, courage, valor, and a melodious, impressive, effective and mentally pleasing sound.
8. *Ashubhanaama* karma. The soul experiences lower physical and verbal conditions. It may have inferior speech, looks, smell, taste, touch, movements, or position, a loss of beauty, fame, physical

strength, courage or valor, and a harsh, unimpressive, ineffective and mentally displeasing sound.

9. High *gotra* karma. The soul experiences a state of elevated class, family status, power, position, industriousness, scholarly achievement, financial gains and prosperity.
10. Low *gotra* karma. The soul experiences a state of lower class, family status, power and position, the loss of its hard-working nature, scholarly performance and prosperity, and suffers losses.
11. *Antaraya* karma. The manifestation of soul powers is obstructed. It obstructs acts of charity, gains, enjoyment, pleasure and spiritual initiatives.

3.11 Working of Karma

Subsidence-cum-annihilation (*ksayopashama*) of psychical karma and the rise of biological karma make worldly activities possible. The soul enjoys favourable conditions on the subsidence-cum-annihilation of psychical karma and the rise of auspicious biological karma, and faces adverse conditions on the rise of psychical karma and inauspicious biological karma. For any event in life, the proper combination of subsidence-cum-annihilation of all four psychical karmas is required.

To explain the working of karma, I will use the following example. Suppose you are enjoying music. At this moment, biological karmas are on rise. Age-determining karma is on rise so that you are alive to listen to the music. The morphological karmas are on rise so that your body is in a proper working condition, your ears are receiving sound and your brain is transforming the sound signals into suitable input for you to understand the music. The rise of feeling-producing karma is producing a good feeling in you, and the rise of status-determining karma is helping you to have a sense of good performance, a feeling of having access to good music. The psychical karmas are in a state of subsidence-cum-annihilation. The ocular and non-ocular awareness-obscuring karmas are being annihilated so that you are aware of the music, and the annihilation of the empirical and articulate knowledge-obscuring karmas enables you to cognize the music. The deluding karma may have either subsidence or annihilation, or both. Wrong belief-deluding karma, being under

subsidence, is active – so you perceive the music as something that makes you enjoy it. Your ego passion, having subsidence, is active – so you have the feeling of possessing this good music album. Your indulgence quasi-passion, which is under subsidence, develops a liking for the music. The enjoyment and re-enjoyment karmas have annihilation so that so that there is no obstruction to your enjoyment. In this example, the soul is the enjoyer and is the main (*upaadana*) cause for the act. The karma body, fiery body and physical body are the principal auxiliary causes, since these help the soul to enjoy. The music system and favourable environment are other auxiliary causes that make listening to music possible.

We find that all eight types of karma are in operation to enable us to physically exist, work coherently in a meaningful manner, and perform the act of our choice. You may similarly try to explain other activities of life with the help of the karma principle.

While the existing karmas are annihilated or subsided, new karmas of a similar type may bond. During any activity the soul is agitating and the karma body is vibrating. The vibrating karma body attracts karma *varganas* and bonds new karma due to the passions at work. On analyzing our experience, we find that we pay maximum attention to our feelings, good or bad. Next, our attention goes to our perception of experience, our desires, our emotions, our liking and disliking and the satisfaction of our desires (ego). For this reason, we bond feeling-producing karma the most and deluding karma the second-most. In practice, seven types of karma bond at any one time (age-determining karma bonds only once in a lifetime and therefore has the smallest proportion out of the eight karmas). The net gain of karma in the karma body may be positive or negative, depending on the karma that is being bonded and that being annihilated.

For this reason, the soul is not able to get rid of karma in a normal way. To reduce the karma balance, the soul must stop the inflow of karma. To achieve this, the soul must control its passions, such as the feeling of ego and liking in the music example given above. The soul has to stop enjoying music; it should consider music to be like any other sound and take no interest in it, thinking that this is the cause of endless migration in the world. It has to develop a feeling of detachment from

worldly pleasures, which look attractive at the time but ultimately bring sorrow and misery. This amounts to renunciation, which is the way to achieve the state of permanent bliss, a state of inner enjoyment.

3.12 The Body System

A living being commonly has three bodies – a physical (*audarik*), fiery (*tejas*), and karma body. The physical body is visible but the other two are invisible. The karma body contains karma, as we now know, and is a kind of information body. The fiery body, comprised of fiery *vargana*, is supposed to be the electric or energy body. The fiery body has two important functions: (1) management of the body systems; and (2) support and control of the physical body. The karma body and the fiery body never depart: both of them are always united with the soul in the mundane state. This union is maintained until the soul attains the state of emancipation. The liberation of the soul is, in fact, obtaining freedom from imprisonment by these two bodies. Kirlian photography has shown that a luminous body leaves the physical body at the time of death, indicating the existence of some kind of subtle body.

A simple model of the body system is shown in Figure 2. The system consists of three bodies: the karma, fiery, and physical bodies. The soul pervades the entire space of the body and is manifest in all three bodies. The karma body is closest to the soul and consciousness; powers of the soul are first manifested in the karma body. The fiery body acts as a link between the karma body and the gross body; it converts these powers into physical actions and interacts with the environment. By means of this system, the soul interacts with the environment and vice versa. Environmental effects are first communicated to the gross body and then reach the soul via the fiery and karma bodies.

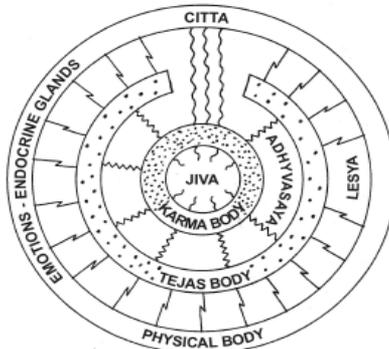


Figure 2 The body system

The *bhava* karma comprises psychical *bhava* karma and biological *bhava* karma. Some of the *bhava* karmas, those which are in a state of fruition (or rise), are active at any instant. The active psychical *bhava* karmas are supposed to constitute the *bhavamanah*, the psychical mind. The agitations or vibrations due to passions in the psychical mind are called *adhyvasaya* and bear the characteristics of the karmas that are active at that instant. The vibrations in the soul due to the rise of biological *bhava* karma are also named *adhyvasaya*, but these are of a different kind. *Adhyvasaya* continuously change with time and *nimitta* plays an important role in this change, as mentioned above. Good or bad *nimitta* produce good or bad *adhyvasaya*, respectively. *Adhyvasaya* vibrations in the soul induce similar vibrations in the karma body, since the principle of parallelism between the *bhava* karma and *dravya* karma holds good. The events in the soul and karma body take place simultaneously. The rising psychical *adhyvasaya* and biological *adhyvasaya* must operate in different ways. The psychical *adhyvasaya* interacts with the fiery body and produces another kind of vibration called *lesya*. The biological *adhyvasaya* is supposed to interact directly with the body's cells, most probably with the DNA and structural proteins, and is supposed to regulate and control the gene functions, biochemical activities, autonomic and other body-related functions. The *lesya* represents our *bhava*, or emotions, thoughts and attitude. Some of the *adhyvasaya* bypasses the fiery body and directly interacts with the brain. This interaction produces a physical imprint of our past memories

and impressions in the brain, which in their physical form are *citta*. The *adhyvasaya* themselves are subtle *citta* and comprise the following four aspects of our personality:

1. Non-righteousness or perversity (*mithyatva*), which distorts vision so that we are not able to see things in the right perspective.
2. Non-restraint (*avirati*), which develops desires in us that produce greed and greed-based habits.
3. Non-vigilance (*pramada*), which develops attachment or delusion.
4. Passions (*kashaya*).

All of these are our internal creations and have no relationship with the physical body or brain. These characteristics originate from *adhyavasaya* or karma.

Adhyavasaya are present in all living organisms, but the mind is only developed in human beings and other five-sensed beings. The *adhyavasaya* performs the functions of the mind in the rest of the living organisms. *Adhyavasaya* is the means of harvesting the intelligence of the soul, as explained in chapter 5. The *adhyavasaya* may be pure or impure. Because of *adhyavasaya*, organisms without a mind (or brain) can also have bondage of karma. This happens in plants and in organisms with one, two, three or four senses.

Lesya provide connections between the subtle body and the physical body. This works in both directions: they pick up signals from the karma body and transmit them to the mind and the physical body, and whatever is performed through the activities of the mind, speech and body is communicated to the karma body by the *lesya*.

The *lesya* are of two kinds: *dravya* (physical) *lesya* and *bhava* (non-physical) *lesya*. Physical *lesya* are radiations; *bhava lesya* is the (perverted) state of the soul. The physical *lesya* in the form of radiation have colors and are classified on that basis. There are six kinds of physical *lesya*:

1. *Krishna lesya* – dull blackish color.
2. *Nila lesya* – dark blue color.
3. *Kapot lesya* – grey color.
4. *Tejo lesya* – bright red color.

5. *Padma lesya* – right yellow color.
6. *Shukla lesya* – whitish color, bright color.

Each kind of *lesya* represents specific qualities of the organism that correspond to the state of the soul or active *bhava* karma. The first three types are the malevolent *lesyas* and indicate negative qualities or emotions. The last three types are the benevolent *lesyas* and indicate the positive qualities of the being.

The intensity of the good and bad attitudes denoted by *lesya* has been explained with the example of getting a fruit. The person who picks up a naturally-dropped fruit has the best, unblemished, attitude, like a pure white colour (*Shukla lesya*). The person who plucks only ripe fruits from the branches is slightly tarnished and possesses an attitude like a light yellow colour (*Padma lesya*). A third person who cuts away small branches to have all of the fruit, both ripe and unripe, has an attitude that is compared with a red colour (*Tejo lesya*). A fourth person who cuts a bigger branch is even lower class, with an attitude like a light grey colour (*Kapot lesya*). A fifth person who cuts the biggest, main branch is very bad, with an attitude like a dark blue-colour (*Nila lesya*). A sixth person cuts away the whole tree, taking a limited quantity of fruits and totally depriving others of the fruits by destroying the very source. He has the worst attitude, which is compared with a dark colour (*Krishna lesya*).

Lesya change over time and only one *lesya* is present at any one time. Human beings and animals can have all six *lesya*. Hellish beings have only malevolent *lesya* and celestial beings have only benevolent *lesya*. *Lesya* are also influenced by colors. Colors have been found to have an effect on our feelings and thoughts. Modern psychologists assess the characteristics of a person based on his liking for a particular color.

In the human body system, according to Acharya Mahaprajna, the *lesyas* are supposed to interact with the endocrine glands and influence the secretion of hormones. Hormones mix with the blood and reach the nervous system and brain, influencing and controlling our emotions, thoughts, attitude, speech, conduct and behavior in the physical plane. Thus the active psychical karmas, through *lesya* and hormones, determine our psychical personality and traits. The endocrine glands

provide a system that establishes the link between the subtle body and the physical body. These glands convert the information received from the karma body in the form of radiation into chemicals, which finally control the body and the brain.

We can now speculate on the working of the body system. The *karman vargana* attracted from the cosmos by resonance action converts into karma by bonding with the karma body. Karma exists in this form for a certain period, as determined by the bonding conditions, and on maturity is emitted as radiations known as *adhyavasaya*. These karma radiations interact with the fiery body to produce *lesya* radiations. As karmas are distinguished by frequency, the *lesyas* also exist in a range of frequencies. This justifies the classification of *lesyas* by colour. These different-frequency *lesyas* interact with DNA, which besides having a chemical composition has also been found to possess the character of vibration, and works like a holographic computer. The fiery body formed by *tejas vargana* is a kind of bio-plasma body that emits radiations to perform management and control functions, of which one form is *lesya* (the other is *prana*, as described above).

From the foregoing, we note the following important roles of karma:

1. Karmas store and maintain information about the activities of the soul.
2. Karmas are the means of communicating the intelligence of the soul to the mind and body. Matter has some organizing power, such as the formation of crystals and some simple types of molecular structures, but the intelligent functions (genetic, cellular, biological and physiological) observed in the body are due to karma.
3. Karmas provide the psycho-physical force for the operation of the body and mind.
4. The karma body functions through radiations that interact with the body, mind and fiery body.
5. The functions of biological and psychical karmas differ in their action. The biological karmas determine, and are essential for,

physical existence; the psychical karmas determine the psychical activity of the soul.

3.13 Relationship between Karma (in fruition) and Body

A crucial question is: how are karma in fruition and the body related? This is a subject of research, but some speculations can be made based on the available evidence. The following appear to be the primary ways in which karma interacts with the body.

1. *Bio-photons*. It has been found in laboratory experiments that all living systems emit a weak current of photons, which provide the energy for chemical reactions in cells and regulate the whole biochemistry and biology of life. The source of this light is said to be a coherent photon field whose source is not known with certainty. The bio-photon emission is indicative of an endogenous, innate, electromagnetic field that pervades the entire organism. Bio-photon emission is thus seen as evidence for a physical basis of life. According to Jain philosophy, *naama* karma is responsible for the structure, design, development, maintenance and other activities of the body. Thus a relationship between bio-photon emission and *naama* karma and other biological karmas must be speculated. These karmas may be connected with the functioning of DNA, which is the basis of life.
2. *Conscious mind*. Psychologists believe in the existence of a conscious mind different from the brain. On the other hand, many scientists are of the view that the brain itself acts as the conscious mind. The brain receives and sends signals to every part of the body and thereby controls the activities taking place in the body. In our model above, the conscious mind (*dravyamanah*) is formed by the fruition of psychical karmas and is connected to the brain for functioning. Therefore it must be envisaged that psychical karmas also play a great role in controlling the activities and functioning of the body system.

The following briefly presents the possible roles of different karmas in the body systems.

1. *Jnanavaraniya* and *Darshanavaraniya* Karma. These two types of karma are responsible for cognition. As this activity is assigned to

the brain and nervous system in medical science, these two karmas may be related to the functioning of the brain and nervous system through the conscious mind.

2. *Mohaniya* Karma. Perception is supposed to be a mental phenomenon in medical science. Therefore the perception-deluding karma that determines our belief system should be related to the functioning of the brain. Emotions are closely related to the secretion of hormones by the endocrine glands. Hence the conduct-deluding karma that determines our desires and emotions must be related to the functioning of the endocrine gland system. The pituitary and pineal glands and the hypothalamus located in the brain have been found to control the functioning of other glands in the body. Therefore the perception-deluding karma, through its influence on the brain, is also expected to affect our emotions and desires.

3. *Antaraya* Karma. Our willingness or resistance to perform an act is assumed to be governed by the conscious mind. The *antaraya* karma therefore is expected to influence the function of the brain.

Please note that the four obstructing karmas listed above operate through the conscious mind. When these karmas are eliminated in the omniscient state the conscious mind becomes redundant. In this state, the psychical mind and the unconscious mind cease to exist; the physical structure of *dravyamanah* or conscious mind continues to exist but is rendered functionless, as the *jiva* no longer needs it. Perception and cognition is made directly by the *jiva*, and the conscious mind or brain has no role in it.

4. *Vedaniya* Karma. The production of pain in medical science is found to be related to the state of tissues in the body and the experience of pleasure has some connection with the secretion of hormones. The state of the tissue is connected to local chemical activity and the performance of genes. So it can be speculated that *vedniya* karma influences the functioning of the genes, local chemical activity and the secretion of hormones by the endocrine glands. As the secretion of hormones also depends on the state of the conscious mind, *vedaniya* karma and the conscious mind

together must produce the pain and pleasure that the *jiva* experiences.

5. *Naama* Karma. Biological science believes that genes carry the code according to which the design, construction, structure, growth and development of the body takes place. *Naama* karma therefore provides the essential ingredient for this function. Different subtypes of *naama* karma describe in detail how the architecture of the body is decided; the parts, organs and organ-systems are built to develop the body structure in a systematic and predetermined way. This karma also decides the growth, maintenance and other activities of the body.
6. *Gotra* Karma. The quality of the body system's performance is also ascribed to the behaviour of the genes. Therefore *gotra* karma must play an important role in the performance of genes. The way the genetic code controls the anatomical and physiological functions, performance of body parts, and functioning of the living system is therefore also dependent on *gotra* karma in addition to *naam* karma.
7. *Ayusya* Karma. *Naama* karma is believed to have a master code for the design, construction and actions of all kinds of species found in *loka*. The *ayusya* karma taps into a specific code from this pool and allows the design and construction of one particular form as specified by *naama* karma. Another important aspect of life that is particularly emphasized in Eastern philosophy is *prana*. In biology, the blood is supposed to be the lifeline of a living system. Therefore *ayusya* karma may be related to the production and circulation of blood and the role of *prana* in the body. *Pranayama* has been found to increase blood circulation in the body, suggesting a relationship between *prana* and blood supply. On death, *prana* leaves the body and the production of blood stops. Death in Jainism means *prana* leaving the body.

Besides the creation of the structure and maintenance of bodies, the system also has arrangements for the defense of the body against possible dangers from the environment, bacteria, viruses, or other harmful organisms as well as from internal malfunctioning and disorders in the system. The body has inbuilt self-healing mechanisms to cure and

protect itself from these dangers and to survive against all odds. The body is a wonderful system that creates structures and maintains and protects the system with minimum input in an optimum and versatile manner. The body has several levels of operation that are activated according to internal conditions, the environment and available resources. The structure of the body depends on the development of consciousness; the activities of consciousness are a function of the structure of the body, the brain in particular. This is because the soul and body are connected. So versatile is the design of the human body that it is impossible for the human mind to design and build even a small part of this system: the entire system is far beyond the comprehension of the human mind.

3.14 The Powers of the *Tejas* Body

As mentioned earlier, the important and primary function of the *tejas* body is the management and control of bodily functions. The *tejas* body provides a coupling between the karma body and the gross body. This is accomplished by supplying *prana* energy, which works as a catalyst in aggregating matter to form structures, starting from cells and tissues to organs and other body parts. The instructions for the design and formation of structures come from the karma body. The *tejas* body is like a bank of *prana*, and the life of this bank is determined by *ayusya* karma. The bank has a continuous input of *tejasvargana* from the cosmos, drawn in by *ayusyaprana*, and supplies *pranas* to the various sense organs and for the functioning of the body, mind and speech, and respiration system (these are known as vital powers). The *tejas* body stops working with the exhaustion of the *ayusya* karma. *Prana* is supposed to be a mix of manifested consciousness and subtle matter and is different from any physical form of electricity.

The *tejas* body is also capable of forming structures outside of the body. Jain philosophy describes a process called *samudghata* in which the expansion of soul-units outside of the body takes place. This projection of soul-units in diverse directions also takes place when the soul is engrossed in the experience of distress and the like, either automatically or brought about through effort (of the soul). With the expansion of soul-units, the karma body and *tejas* body also extend to the same extent. For example, in *kevalisamudghata*, before the final stage of liberation (in the 14th *Gunsthana*), the soul expands into the entire *loka*.

In this process, the karma body also extends into the whole *loka* and any excess of *vedaniya* karmas, that is, more than is required to balance the remaining *ayusya* karma, are dissociated from the karma body. The *tejas* body also experiences a similar extension in the process.

Prana energy can also catalyze the formation of structures or influence natural structures outside of the body by the power of the soul. For example, the soul can form another body of a desired form besides his main body. This power is commonly found in *devas* who can assume any form they like and materialize any object of their choice. In such a process, the soul has to expand in space so that the karma body and *tejas* body also experience extension. For the formation of another body, the *ayusya* karma must tap into the code required for the desired form from the pool of *naama* karma. The *tejas* body can then materialize either the desired form with the help of *naama* karma, or the intended object by aggregating material particles present in the environment. The life of this second body is expected to be short and does not count towards the life of the main body. This kind of feat is also possible for human beings if they can develop the soul power to expand willfully outside the body. There are many examples where yogis can produce a desired smell or an object of choice. This is not a miracle but the exercise of the powers of the soul through the *prana* body. However, the performance of such a feat is prohibited in spiritual life, as it results in the wastage of soul powers, which should be reserved for the cause of emancipation rather than being used for worldly exhibition that adversely affects the spiritual cause. Yet another power of *prana* energy is that it can be used as electric fire. Goshalak used it on Mahavira.

There is another possibility in which a holographic image of the main body is produced. In this case, the production of multiple images is possible. It appears that the *prana* energy can be turned into the laser that is required to produce holographic images. Gautama Buddha and Krishna are said to have exhibited this kind of power to their followers.

The effectiveness of the *tejas* body is influenced by the karma body. The two kinds of bodies exist as some kind of static electric field that interacts with each other. When the karma field is strong, the powers of the *tejas* field are limited and no structures can be produced outside the body – so the first condition for a human being to perform such a feat is to reduce

his/her karma. This generally is applicable to saints and yogis who have attained a higher spiritual stage that allows them to expand their soul outside of their body, and who have reduced their karmas to a level where the *tejas* body is able to use *prana* energy to form structures.

Besides the formation of structures, the powers of the *tejas* body can also influence natural structures existing in the environment. For example, in the region around Tirthankara the climate remains favourable for all living beings and there are no floods, droughts, or earthquakes. This happens due to the expansion of the soul-units of Tirthankara and the powers of the *tejas* body that create some kind of balance in the environment and prevent excesses from taking place. All beings in this region experience love and friendship with each other, since their *tejas* bodies are influenced to generate such conditions in their own self. It is also possible for yogis to influence the local climate to produce or prevent rains by exercising control over clouds. Yogis do it in the interest of the good of the local community and have no self-interest in such activities. The powers of the soul and the capabilities of the *prana* body are immense, but all spiritual souls use these powers only for the benefit of mankind. However, there are examples in Indian literature when they used these powers for self-interest and destructive activities. They never fulfilled their spiritual aims.

There is yet another way in which the extension of soul-units can take place. If the *prana* body is extended by some means, the karma body is also extended (since the two are coupled), and the soul experiences extension to the same extent. A divine soul that has attained a higher spiritual state and is able to extend his soul may transmit some of his *prana* to an eligible and able follower, through some psychic center (usually the brow chakra) of the recipient, who then experiences extension of his *prana* body. *Prana* body being of an electric nature, this process of the transfer of *prana* may involve the transfer of an electric charge or the inducement of a similar electric field in the recipient's body. The karma body of the recipient undergoes a similar extension. In this process, the *prana* becomes an auxiliary cause for the transformation and fruition of relevant karma, such as *shubhanaama* karma and *gotra* karma, and the soul of the recipient experiences a corresponding

transformation. The soul-units of the recipient are also extended, and the soul goes through some kind of experience that is made possible by the fruition of karma on the one hand and by soul units coming into contact with objects in the extended space on the other. Such experiences may provide the soul of the recipient a glimpse of space and reality in the region of extension that is not possible in the original state of the soul. Such experiences have been reported by many yogis like Paramhansa Yogananda, Pt. Sriram Sharma Acharya, Shyamacharan Lahiri etc., induced by their respective gurus (see *Autobiography of a Yogi* by Shri Paramhansa Yogananda and *Hamari Vasiyata and Virasata* by Shrirama Sharma Acharya). By this method, a guru is able to impart advanced spiritual experiences to his follower, who is then encouraged to proceed on the path of spiritual purification with increased vigour, confidence and determination.

3.15 Connections between the Bodies

How the subtle bodies and the gross body are physically connected to each other? Without any connection, they are not likely to hold together. According to the text Gommatasara (Karmakanda), the body (*sarira*) form-producing karma has the following types of bonds:

1. Gross-gross body bond, meaning that parts of the gross body bond together.
2. Gross-fiery body bond, meaning that these two bodies bond together.
3. Gross-karma body bond, meaning that these two bodies bond together.
4. Gross-fiery-karma body bond, meaning that these three bodies bond together.

Similarly, there is bonding between parts of the fiery body and between the fiery and karma bodies.

The karma and *tejas* bodies are made up of *karman vargana* and *tejas vargana*, respectively, and are of an electric nature or have some kind of static electric field. These two bodies therefore probably have an affinity or some kind of electrical attraction. A third unit of the conscious mind (*dravyamanah*), which is made of *manovargana*, comes

into existence in five-sense beings. This *vargana* is of a similar kind, so the three units mix together to form a subtle composite structure. The three kinds of *varganas* perform different functions according to their specific properties, but are not different spatially: they occupy the same space as the gross body and the soul. The working of the conscious mind is different from that of the other two subtle bodies since it is dependent on the structure of the gross body. The mind works in conjunction with the brain and the nervous system, and in the absence or malfunctioning of this system the mind, in spite of having the potential power, cannot deliver the requested output. This is not the case with the karma and *tejas* bodies, as these are unaffected by the structure of the gross body.

Besides having mutual connections, these three units are also connected to the gross body. In the beginning of the lifecycle, the *tejas* body is the first to make contact with the fertilized egg – that is, the fertilized egg is infused with the *prana* energy of the *tejas* body because of the *ayush* karma of the soul taking birth. The *naama* karma then decides the structure and further growth of the body. All of the karmas are supposed to be transferred to the gene structure of the egg cell by the process called *paryapti*. The subtle energy of the *tejas* body, *prana*, is the essential ingredient for the structure and functioning of the gross body and there is intimate connection between the *tejas* and gross bodies. *Prana* flows to the gross body and it is distributed to other parts through *prana* channels known as *nadis*. In this manner, the gross body is energized for it to function. The karma body, on the other hand, is intimately connected to the soul but is also linked to the *tejas* body. Thus the soul has a primary connection with the karma body and a secondary connection with the *tejas* body. The karma body is connected to the gross body through the *tejas* body and also through the conscious mind.

The conscious mind is a derivative of *ghatin* karma and it functions in conjunction with the brain and the nervous system. So the conscious mind is intimately connected to the gross body on one hand and to the karma body on the other hand. Thus the *tejas* body, conscious mind and

gross body are connected to the karma body in various ways. The connection of the soul to these three units is made through the karma body.

There are two ways in which the *tejas* body establishes connections with the developed gross body. One way, through *prana* energy, was described above. The other way develops due to electrical activity in the gross body. The gross body has centers of intense electrical activity like the brain, nervous system, endocrine glands, joints, extremities like fingers and toes, and other centers recognized in the acupressure and acupuncture systems. These centers induce high electrical activity in the *tejas* body, leading to the formation of local vortices in the *tejas* body, which are called chakras in the yoga system. These chakras become channels of *prana* energy transfer between the *tejas* body and the gross body; they also provide additional coupling between the two bodies. The major chakras are located in the brain and on the spinal cord, matching the position of the endocrine glands. The rate of energy transfer in these channels is a function of the *prana* potential that can be increased by *pranayama* techniques. The conscious mind becomes a catalyst in this activity; by focusing attention on a particular center, the rate of energy transfer at that center can be increased manifold. The increased rate of energy transfer enhances metabolic activity, improves the health of the gross body and enables the various body systems to function efficiently. The location of chakras shift in space as the body grows and develops. At the time of conception, no chakras exist; the chakras only come into existence as the body parts are formed. The enhanced potential and increased activity in the *tejas* body also influences the karma body, which undergoes transformation and ultimately affects the soul. Vortex formation in the *tejas* body may also extend to the karma body and the conscious mind because of their spatial relationship, resulting in a kind of coupling between these units. All units of the system are therefore interconnected and mutually influence each other. The activities of the gross body, *tejas* body (*prana*) and conscious mind all influence the soul in some way. For example, it can be seen that in meditation practice, focusing attention on the chakras and *pranayama* practices are potent means of influencing the karma body.

The living being is a coherent system: all of its component units (the soul, the subtle body, comprising the karma body and the *tejas* body, and

the gross body) work in unison and in a coordinated way. Any activity of the system has component activities in the three units simultaneously and the three component activities together constitute the system activity or the life event. The three units need energy for action and have individual, but interconnected, energy sources. The soul is its own energy source; it has *virya* property without which no activity in the soul can take place. The fiery body is the energy source for the subtle unit. The fuel for energy in the fiery body is *tejas vargana*, which flows in from the cosmos. The energy source in the gross body is oxygen inhaled by the respiratory system, which is stimulated by the *prana* energy of the fiery body. The oxygen is carried to all parts of the body by the circulating blood. Oxygen generates energy in the cells through metabolic processes. Thus *virya*, *tejas vargana* (*prana*) and oxygen (*pranvayu*) are all essential for the life of mobile beings. The system of immobile beings is of a different kind that does not require oxygen to live.

At the time of death, *ayusya* karma is completely eliminated and the connection between the *tejas* and gross bodies is snapped. The brain stops working and loses connection with the conscious mind. The connection between the conscious mind and the *tejas* body is also snapped, as this needs a working brain. When the soul leaves the body the conscious mind does not accompany it; only the karma and *tejas* bodies transfer to the new gross body. For this reason conscious memories are not carried forward into the new life, but the information in the karma body, the unconscious mind, is carried forward. In the absence of the gross body the chakras do not exist; these are formed again in the new body according to its structure.

It is interesting to know what happens when the soul transfers from one body to another in its lifetime, a feat that can be performed by some yogis. In this case, the *ayusya* karma is in balance and the connection between the brain and the conscious mind is not snapped. Therefore the conscious mind is also transferred to the new body along with the karma and *tejas* bodies. How the conscious mind works in the new body depends on its structure. Suppose a human soul transfers to a dead human body: a proper brain structure is available. The *tejas* and karma bodies are connected to the new gross body and the conscious mind

functions according to the existing brain structure. On the other hand, if a human soul transfers to an animal body, say a (dead) lion, the karma and *tejas* bodies are connected to the new gross body as before, but the conscious mind suffers the limitations of the brain structure available in the lion's body. Although the soul continues to feel the existence of its human form through the conscious mind, the functioning of the mind is impaired. The soul now thinks as a human being (i.e. purely mental activity) but can only perform the activities of a lion as compatible with the available body and brain structure. The behavior of this lion will of course be different from other lions and will have many behavioral characteristics of human beings.

This is only a broad analysis of the possible connections among the bodies. A great deal more thinking and research is required to explore the wonders of the body system scientifically.

3.16 Karma, Free Will and Destiny

The philosophy of Mahavira advocates the doctrine of existence of the soul. There are three consequences of this doctrine: (i) the doctrine of free will (*purusarthavada*); (ii) the doctrine of karma; and (iii) the doctrine of rebirth.

The doctrine of free will, self-command, or self-governing, rejects the doctrine of God as the Creator, preserver and destroyer of the universe. These doctrines are opposed to each other and one will be futile in the presence of the other. It is not possible to explain the changes that are taking place in the world of living beings based on the doctrine of God as the author of creation. This is why Lord Mahavira founded the doctrine of free will. This is the doctrine of the soul as the maker or unmaker of itself. Each soul exerts its own energy for its action and enjoys the fruits thereof.

An apparent contradiction between the doctrine of free will and the doctrine of karma may be suspected. If our karma is responsible for the events that take place in our lives, then free will is useless; if free will is responsible for worldly events, then karma will be a futile postulate. This contradiction has been avoided by Lord Mahavira. His philosophy defines karma as the result of free will which is not controlled by karma.

Free will is the root cause of worldly events. Karma is only a secondary cause because it can be changed by the power of free will.

Free will also has its limits. It is not omnipotent. There are occasions where free will is impotent. The truth is that free will and karma are interdependent and relative. Karma is not omnipotent since change can be brought about in it by the power of free will. Free will is also not omnipotent because it is powerless to resist the retributions of *nikachita* karma. The outcome of this is that sometimes karma is more powerful than free will and sometimes the reverse is true.

There are five factors which determine our destiny:

1. *The power of the soul (Swabhava)*. The power of the soul is immense, and no amount of karma can completely obscure it. The power of the soul is so great that if a person is determined to proceed on the path to emancipation, the karma will go into a silent mode. With powerful action, the soul can destroy the karmas and pave the way for liberation.
2. *Circumstances*. We have no control over our circumstances, and we have to adjust accordingly. Karma has no role in choosing or meeting with a spouse, the children born to a couple, meeting with or departing from loved ones, loss or profit in business, etc. Similarly, natural calamities like floods, droughts, storms, earthquakes, etc. have nothing to do with karma. Government policies and rules are based on considerations other than karma. In essence, the destruction and production of anything other than our self is governed by its own causes and is not connected with our karma.
3. *Time*. Time is an independent operator. It affects everything in the universe including our lives. Every event takes time to happen. Some events are time-dependent and bear no relationship to our karma.
4. *Karma*. Karma is the most important operator in our destiny. It plays the major role in deciding the course of our life. The effects of karma can be moderated by acting as a neutral observer of events, and through penance and meditation.
5. *Free Will and Soul Initiative (Purushartha)*. By taking the proper initiative, a person can change the course of his life which

otherwise would be guided by karma. Right initiative provides a means to shape our destiny according to our will. Strong determination, courage, untiring efforts, self-confidence, energy and faith are needed. You can be the architect of your own destiny by inculcating such virtues. The bonds of karma can be changed through proper initiatives. It is possible to have an early rise of karma, in which the intensity of the action of the karma will be reduced; and the nature of karma can also be changed, in some cases, by taking positive initiatives. The choice is with you. All great men in the world have fought with their karma and won. Greatness is not a gift; it is earned by hard work, perseverance, dedication and determination. This is the way to defeat karma and to shape the future. In the absence of proper initiative, karma is the master of your destiny.

Karmas bear fruit in later life or in later births. Auspicious activities produce pleasure, peace and happiness. Inauspicious activities produce pain, misery and unhappiness. “You reap what you sow” is absolutely true. Your present state is the result of your past karma. What you do in this life shall determine your future (in this life or the next). You shape your future. While you enjoy the fruition or rising of karma, you also bond new karma due to the activities you perform. Generally, as the karma balance is reduced through spiritual efforts, life is manifested with more intelligence, powers, happiness and peace. On elimination of psychical karma, one becomes Omniscient.

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Some Concepts of the Psychological Structure of Soul

4.1 Introduction

In the first chapter, I mentioned the formation of the virtual structure within the soul. This structure of the soul is traditionally recognized as *bhava* karma. This is broadly divided into two parts: the psychological karma structure and the biological karma structure. Both structures have an independent existence; the psychological structure exists only when the biological structure exists. The psychological structure constitutes nescience (*ajnana*), delusion and inertia (that obstructs the manifestation of soul energy), and constitutes the perverted state of the soul. The biological structure forces the soul to have a physical form. This structure does not interfere with the psychic powers of the soul, but rather prevents the soul from attaining its natural state of eternal, unchanging existence and formlessness.

What is the form of this structure? I attempt here to study the psychological structure generated as a consequence of the cognition process, which is an inherent activity of the soul. But first I conduct an in-depth study of several technical terms, after which I propose a model of the cognition system that will help to identify some structural concepts of the soul.

4.2 *Jnana*

In the Agama period, *jnana* is identified as a means for the ethical progress of the soul; it was one of the constituents of the path of Moksa. *Jnana* which did not help in obtaining Moksa was *ajnana* or *mithyajnana* (perverted *jnana*). The difference between *jnana* and *ajnana* was not objective, but subjective. The cognition of a *samyakadristi* (a soul with an enlightened worldview), whether logically correct or incorrect, was inherently *samyakajnana* (enlightened *jnana*). Similarly, the cognition of

a *mithyadristi* (a soul with a deluded worldview) was *ajnana*. In the period of logic, *jnana* was redefined as the property of the soul to apprehend reality. *Jnana* now became an objective fact.

Cognition, with its two aspects of *jnana* and *darshana*, is a permanent feature of the soul. It is not an accidental phenomenon produced by external factors. Different forms of cognition are modes or *paryayas* of the *guna* property of the soul.

Gautama : O Lord! Is the soul *jnana* or *ajnana*?

Mahavira : O Gautama! The soul is *jnana* as well as *ajnana*, but *jnana* is positively soul.

Thus both *jnana* and *ajnana* are part of the soul.

In the mundane existence of the soul, the *jnana* is clouded by karma. However, irrespective of this karma veil some *jnana* always manifests. The manifested *jnana* is divided into four classes based on its possible applications, which depend on the intensity of the karma veil. When the veil is thicker the manifested *jnana* is known as *matijnana* (empirical knowledge), which takes the help of the senses and mind to cognize an object. The *jnana* is known as *srutijnana* (articulate knowledge) when the soul cognizes an object that was cognized earlier by another soul. *Srutijnana* requires *matijnana* for its manifestation.

When the karma veil is thinner, the soul can directly cognize objects without the help of the senses or the mind. In this state, the soul can perceive objects which are beyond the range of the senses and mind. Direct cognition is of two types. *Avadhijnana* (clairvoyance) directly perceives both external objects and the self. *Manahaparyayajnana* (mind reading) directly perceives the thoughts of other mundane souls. When the psychical karma veil is completely eliminated, the pure *jnana* of the soul, *kevalajnana* manifests, and can cognize the self in all of its aspects as well as all objects: small and big, near and far, past and future.

4.3 Darshana

Darshana is awareness or self-awareness. Jainism does not differentiate between *jnana* and *darshana* as far as the cognizer and the object are concerned. *Darshana* is devoid of judgment; it is more like awareness without any predication.

Like *jnana*, the *darshana* attribute of the soul is also veiled by karma. In its veiled state the manifested *darshana* attribute is divided into five categories, of which the last category, slumber (*nidra*), is further divided into five types. The 9 types of *darshana*, defined by their respective obscuring karma, include:

1. *Chaksudarshana* – apprehends an object through the sense of sight
2. *Achaksudarshana*– generally understood to be the apprehension of an object through non-visual senses and the mind, but some scholars have objected to this because the mind has no *darshana*
3. *Avadhidarshana* – clairvoyance qua intuition
4. *Kevaladarshana* – omniscience qua intuition

According to the theory of karma, the remaining 5 types of slumber (*nidra*) do not put any obstruction on *jnana* or *darshana*, but rather obscure the cognition of details.

4.4 Intelligence and Knowledge

Knowledge is the outcome of the manifestation of the intelligence property of the *jiva* with respect to its capacity for comprehension. The cognition function of *jiva* takes place when both *jnana* and *darshana* attributes manifest; it is the comprehension of objects with their details. Intelligence may be considered an attribute (*jnana*), a manifestation of an attribute, an ever-changing series of cognitions, a process, an activity, or an entity in itself. These are all partial descriptions of intelligence that cannot individually give a full picture of the *jiva* with respect to its intelligence attribute: all describe the same entity in various ways.

The process of knowledge is constituted by the momentary modes of the intelligence attribute, and so may be looked upon as a series of cognitions. When these modes are perceived along with the attribute behind, intelligence may be considered to be a process. As an element in the structure of the *jiva*, intelligence may also be considered a potentiality. From its functional aspect, it can also be considered an

activity. Again, if intelligence is considered in isolation it may also be taken as an entity in itself.

Empirically, knowledge is the result of the cognition process. In Jain philosophy, an object is supposed to have infinite aspects; to apprehend all aspects at a time would need infinite intelligence. Our normal cognition is limited by the karmic veil, so we perceive and know only some aspects of the object. This makes our knowledge of the object incomplete. Incomplete apprehensions introduce an element of doubt about the object; subsequent cognitions may be different from previous ones. This is also true of most scientific observations, which are never complete because of the limitations of the observer and the instruments used in the observation.

Any cognition activity outputs a piece of knowledge that is added to the soul's previous body of knowledge. The knowledge we have at any time is the sum total of the knowledge generated by the soul throughout the past. The soul has passed through innumerable (or infinite) modes in the past and has generated knowledge in each mode. Some of that knowledge is present in the psychological structure of the soul. It is thought that much of the knowledge, or nescience, that is acquired in the lower forms of existence (up to four-sense beings) and stored as *bhava* karma may have been eliminated if the soul is to exist in human form.

The principal karma that colors our perception, and hence the knowledge derived from our perceptions, is deluding (*mohaniya*) karma. Like *jnana*- and *darshana*-obscuring karmas, *mohaniya* karma is also variable; it is at its highest in one-sense existences and gradually decreases in higher existences. Thus the colour of the manifested knowledge also changes from one life form to another, meaning that each element of knowledge had a different color at the time of its generation. The knowledge acquired as a human being is generally purer than the knowledge gained as an animal. By this logic, we expect that the knowledge acquired by direct cognition in the case of *avadhijnana* and *manahaparyayajnana* is purer than the knowledge of souls who, like us, have only *matijnana* and *srutijnana*. With a reduction in deluding karma cognition becomes purer and closer to the truth.

4.5 *Ajnana* (Ignorance)

Ajnana may be interpreted to have four meanings:

1. *Wrong knowledge.* According to Jain logic, valid knowledge (*prama*) means a decisive cognition of the self as well as an object. Wrong knowledge is known as *samropa* (false imposition), which has three types: (1) *samsaya* (doubt); (2) *viparyaya* (illusion); and (3) *anadhyavasaya* (indistinct appearance). *Darshana* is generally included in the last category, but while *anadhyavasaya* stops with its flash of indistinct appearance, *darshana* later develops into knowledge. No demarcation can be drawn between right and wrong as far as incomplete knowledge is concerned. According to Jain logic, the difference between truth and falsehood is not that of quality, but of degree.
2. *Perverted attitude.* *Jnana* is *samyagjnana* (enlightened *jnana*) when it cannot be reversed, and *ajnana* or *mithyajnana* (perverted *jnana*) when it can be reversed. In itself, *jnana* is neither *samyaka* (enlightened) nor *mithya* (perverted): it is *samyaka* or *mithya* according to the attitude (*dristi*) of the subject, which is influenced by deluding karma.
3. *Absence of knowledge.* The absence of knowledge is due to the veil of *jnana*- and *darshana*-obscuring karmas. These two karmas can be *sarvaghatin* (completely obscuring) or *desaghatin* (partially obscuring). Therefore, *jnana* may change according to the attitude of the subject. The knowledge of *mithyadristi* (possessing perverted attitude) is not held to be rational, and is therefore *ajnana*.
4. *Cause of ignorance.* The cause of ignorance is intelligence-obscuring (*janavaraniya*) and awareness-obscuring (*darshanavaraniya*) karma.

4.6 The cognition process

All natural processes are complex, involving several variables and factors. To study such processes analytically, a simple model is usually made based on simplifying assumptions. The results obtained from this model are extended to predict the behavior of the original process. Such predictions, though approximate, are supposed to give a fair idea of the performance of the real process. If necessary, correlations can be

established between predicted and actual results to minimize the approximation. I make such an attempt here to study the cognition process that takes place in the soul.

In the cognition process, the *jnana* and *darshana* potential energies of the soul manifest through the cover of the perception-deluding karma. This manifestation can be regarded as a flow of the soul energies that generates knowledge. Thus, this process of knowledge generation is similar to the generation of power in a hydroelectric power station. In this type of power station, water stored in a reservoir flows through a turbine generator system where a part of the potential energy of the flowing water is converted into electrical power. The remaining energy flows to the river sink through the discharged water. If P is the potential energy input to the system and W is the electrical output, then $W=EP$, where E is the efficiency of the system. The remaining energy, $(1-E)P$, is discharged to the river.

The soul is the reservoir of spiritual energy, which manifests under the influence of *bhava* karma. We assume that the soul energies flow out as streams defined by the various subtypes of karma. The psychical *bhava* karmas obstruct the flow of these energies, limiting the actual manifestation of the potential powers of the (pure) soul. The *bhava* karmas can be assumed to constitute valves in the flow of soul energies. In the case of *sarvaghatin*, or fully obscuring karma, the valve is either fully open or fully closed: there is no intermediate position. In the case of the *desaghatin*, or partially obscuring karma, the opening of the valve varies with the level of the psychical karma's *ksayopashama*. The flow of energy may also be obstructed by the rise or fruition of *antaraya* karma. Hence the manifested flow of energy M is given by $M = Q - K$, where Q is the ideal flow of energy in a given situation in the absence of psychical *bhava* karma (i.e. in the omniscient state). It must be noted that in the omniscient state the *jnana* and *darshana* energies of the soul are infinite, but the flow of energy Q is finite and depends on the object to be known. That is, all of the infinite energy of the soul is not used at any one instant; only the fraction of energy that is required for cognition is used at one time. The value of Q shall vary with the complexity of the cognition in question. K is equal to the reduction in the flow of energy

caused by the existence of corresponding *bhava* karma. The value of K depends on the *ksayopashama* level of concerned *bhava* karma: the more *ksayopashama*, the less the value of K. So the value of M, the flow of energy that is actually manifested, increases with the *ksayopashama* level of the *bhava* karma. For example, M will be higher in human beings compared to animals and so on. In the omniscient state, K is zero and M equals Q.

Figure 1 shows the cognition process that takes place in the soul. There are five valves of *jnana*-obscuring karma and nine valves of *darshana*-obscuring karma, corresponding to the five types of *jnana* and nine types of *darshana*. We consider here the common case of *matijnana* and *srutijnana*. In this case, the *kevalajnana* karmas are on rise, i.e. the *kevalajnana* valve is closed and the *avadhijnana* and *manhaparyayajnana* valves are also closed. We also assume that the *avadhidarshana* and *kevaladarshana* valves are closed. The slumber valves are closed in the wakeful state and open during sleep. This is the general case applicable to all beings. It must be mentioned here that the karmas veiling *mati*, *sruti*, *avadhi* and *manahaparyayajnana* and *caksu*, *acaksu* and *avadhidarshana* are partially obscuring (*desaghatin*) and the karmas veiling *kevalajnana*, *kevaladarshana* and slumbers are fully obscuring (*sarvaghatin*).

In any cognition process, let

j_1 = manifested flow of *matijnana* energy

j_2 = manifested flow of *srutijnana* energy

d_1 = manifested flow of *chaksudarshana* energy

d_2 = manifested flow of *achaksudarshana* energy

at any time t due to the *ksayopasama* of the corresponding karma.

Let J be the total flow of manifested *jnana*:

$$J = j_1 + j_2$$

and D be total flow of manifested *darshana*:

$$D = d_1 + d_2$$

Both J and D together provide the energy for the cognition process. But before this process occurs, the *darshana* D passes through the filter of the rising *darshanamohaniya* (perception-deluding) karma and is

coloured by this karma to form D_p . In fact, it is D_p and not D that participates in the cognition process.

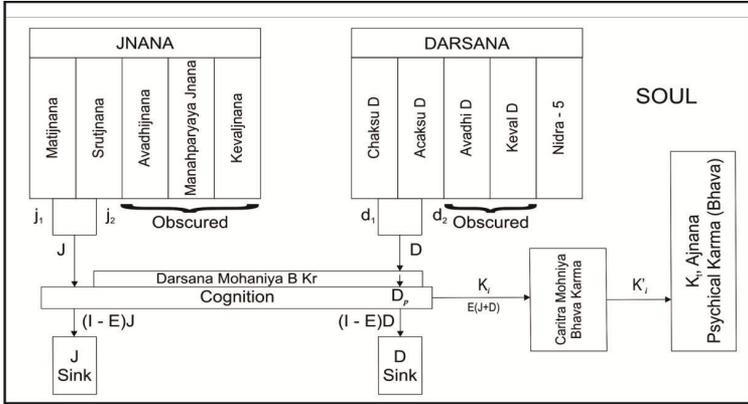


Figure 1 Cognition Process of the soul

Both D and D_p are of the same quantity but differ in quality. In the wakeful state, both J and D_p participate in the cognition process. In the sleep state, J is absent, i.e. $J = 0$ and D_p consists of d_{2p} only, i.e. $D = d_{2p}$. The soul now perceives some part of the generality rather than the particularity of the object. It may be noted that in the *matijnana* process j_2 is zero, and in the *srutijnana* process both j_1 and j_2 are non-zero. In both of these cases d_1 and d_2 are non-zero.

The efficiency of the cognition process E depends on the *ksayopasama* level of the *darshanamohaniya* and *antaraya* (soul energy-obstructing) karma. The active *antaraya* karma offers resistance to the utilization of cognition energies, which also reduces the efficiency of the process. This means that only part of the manifested *jnana* and *darshana* energy contribute to the knowledge output of the cognition process. The knowledge output K_i is $E(J+D)$. We assume that the balance *jnana* $(1-E)J$ and balance *darshana* $(1-E)D$ each flow to some kind of reservoir in the soul and are reserved for future use. These energies remain unutilized for the time being (see delayed cognition below). The output knowledge is of the *mati* type if j_2 is zero and of the *sruti* type if both j_1 and j_2 are non-zero.

The output knowledge K_i is subjective because of the color imparted by *darshanamohaniya* karma. Therefore, the output of

knowledge from the cognition process is (1) only a fraction of what is possible with the manifested *jnana* and *darshana* energy and (2) subjective, i.e. perverted knowledge. The knowledge K_i passes through another filter of active *charitramohaniya* (conduct-deluding) karma before it is stored in the memory bank. A bias of the passions and quasi-passions in operation at that instant is imparted to the cognition output. We have separated *charitramohaniya* from *darshanamohaniya* in this model because the former does not participate in the cognition process. Note that the quality of knowledge is a function of *darshanamohaniya* karma, i.e. the knowledge of a *mithyadristi*, non-believer, and the knowledge of a *samyakdristi*, believer, is differentiated.

Cognition takes place in a continuous series; any cognition activity outputs elemental knowledge K_i that is changed to K_i' by conduct-deluding karma. This knowledge is additive and the total knowledge K_t generated till time t is the sum of all the knowledge elements generated till then. We have

$$K_t = \sum_{i=0}^{i=t} K_i'$$

Here $i = 0$ must refer to the beginningless time that the soul has been in existence, and t covers all the life spans that the soul has had in the past, including the present one.

If K_t' is the knowledge eliminated by the annihilation of *bhava* karma, then the knowledge balance K_b in the memory bank at any one time t is

$$K_b = K_t - K_t'$$

Based on the above model, we can make the following observations and inferences:

1. The *matijnana* energy j_1 should represent the soul's faculty of creative or intuitive thinking. This is manifested in the body through the senses and mind and suffers from limitations imposed by them.
2. The *srutijnana* j_2 is supposed to represent the soul's faculty of rational thinking, including deductive and inductive reasoning. This is supposed to manifest with the help of *matijnana*, i.e. j_2 exists only when j_1 is non-zero.

3. The faculties of creative thinking and rational thinking together must constitute the intellect. The intellect thus is $J = j_1 + j_2$ where j_1 is creative intelligence and j_2 is rational intelligence. Intellect is manifested *jnana* and is the power of the soul to comprehend the details of an object.
4. The *chaksudarshana* (d_1) represents the soul's faculty of awareness manifested by the sense of vision.
5. *Achaksudarshana* (d_2) represents the faculty of awareness manifested by the other senses.
6. The total awareness faculty D of the soul is $D = d_1 + d_2$. The awareness coloured by *darshanamohaniya* karma, D_p , can be called perception, which is subjective.
7. What is *buddhi*? The *buddhi* or rational mind is the faculty of the soul that is supposed to jointly take stock of the rational, creative and perceptive abilities. This suggests that intellect and perception, taken together, constitute the *buddhi*. Thus *buddhi* B is
 - i.
$$B = J + D_p = j_1 + j_2 + (d_1 + d_2)_p$$
8. The *buddhi* has a wide spectrum and includes a wide range of abilities and powers of the soul. *Buddhi* is the decision-making power of the soul and is biased by the active perception-deluding karma.
9. *Buddhi* is at a minimum level in one-sense beings, where both J and D_p are considered to be at their lowest level. The level of *buddhi* increases in higher-sense organisms with a higher *ksayopashama* of obscuring psychical karma. It is relatively higher in human beings, who have a developed mind, than in animals.
10. Cognition is the intelligent activity of the soul and *buddhi* is the active force behind decision-making. The cognition output (knowledge) has been coloured by *mohaniya* (deluding) karma. As long as *mohaniya* karma is in existence, the knowledge of the soul is subjective and perverted.
11. Note that the value of J and D_p , and hence intellect and *buddhi*, are based on the *ksayopashama* of *jnana*- and *darshana*-obscuring karma and remain unchanged unless a change in the *ksayopashama* level takes place. In contrast to this, knowledge K_t increases with

time because cognition is a continuous process. This is an important difference between intellect, *buddhi* and knowledge. Intelligence is an intrinsic property of the soul; it is beginningless and endless. Knowledge is acquired by intelligence; it has a beginning and an end and can be reversed. Intellect and *buddhi* cannot be acquired from outside; they can only be developed by the *ksayopashama* of intelligence and awareness-obscuring karma. Intellect and *buddhi* are not influenced by conduct-deluding karma. The *ksayopashama* of perception-deluding karma improves the quality of perception by reducing the colour. This is possible in all human beings, whether they are laymen or ascetics. Ascetics' *ksayopasama* of conduct-deluding karma is also high, so their perception and conduct are purer than that of laymen and their knowledge is relatively un-biased.

12. Perception-deluding karma varies in the cognition process. This means that each K_i is associated with a different perception-deluding colour.
13. Perception-deluding karma acts independently of conduct-deluding karma. This implies that conduct should not be an essential condition for clairvoyance; rather, the essential condition for clairvoyance is the *ksayopasama* of *avadhijnana* and *avadhidarsana*-obscuring karma. This can happen with both ascetic and non-ascetic individuals. In the presence of perception-deluding karma, clairvoyance is biased and is called *vibhangajnana*. When perception-deluding karma is eliminated in *samyagdristi jiva*, clairvoyance becomes unbiased and is called *avadhijnana*.
14. What is mind (*manah*)? Mind is the faculty of the soul that performs the functions of feeling, willing, thinking and imagining. The other attributes of mind are memory, recognition and judgment. This suggests that the mind must be a composite structure consisting of three things: (1) rising conduct *mohaniya* karma for feeling and willing; (2) *buddhi*, B, for thinking, imagining and judgment; and (3) knowledge, K_i , for memory and recognition. This is the psychical mind. It has a counterpart in the physical mind that is made of *manovargana*. The physical mind

works in conjunction with the senses and interacts with the external world. The two types of mind work in parallel and are related to each other by the rule of correspondence. The mind presents options and makes judgments; the decision is taken by *buddhi*. *Buddhi*, though part of the mind, is independent of the conduct *mohaniya* karma and *ajnana* of the soul and is in a position to make decisions free of their influences. This means that a soul that is not highly placed with respect to conduct and that lacks detailed knowledge of the world can also make good decisions in life. Education increases knowledge of the world and is supposed to enhance one's power of thinking and imagination, but education is not an essential condition for making good decisions. A less educated person can also make good decisions and may, in fact, lead a happier life than an educated individual. But *buddhi* usually follows the mind (*manah*), which is inclined towards worldly attractions; only wise individuals respect the decisions of *buddhi*. There is yet another category of persons who ignore the mind and *buddhi* and instead listen to the inner call, the *antahapragya* or intuitive faculty that motivates the soul to spiritual pursuits. Such individuals ignore worldly pleasures and decide in favor of the upliftment of the soul. This happens when the mind has been silenced so that the inner voice can be heard.

15. Jainism classifies living beings into two categories: those endowed with mind (*samanaska*) and those without mind (*amanaska*). All deficient beings, with up to 4 senses, are not supposed to have a mind. The level of *buddhi* in deficient beings is low, so they are not in a position to think and imagine. Because their knowledge is limited, their memory is negligible. However, they do have a faculty of feeling and willing. From this point of view they have a mind, which in this form is known as instinct (or drive or urge) (*samjna*). Instinct is a natural faculty of all beings and is primarily the consequence of active *mohaniya* karma. We may regard instinct as an undeveloped mind. The mind in 5-sense beings has a higher level of *buddhi*, allowing for the development of knowledge; it can therefore be said that they are endowed with mind.

16. We see above some of the roles of intellect and *buddhi* in the activities of the soul. These faculties of the soul in fact have multiple descriptions, as was mentioned earlier.
17. Consciousness exists at many levels and the *jiva's* spiritual progress takes place from the lowest to the highest level. We exist at a level determined by our karma. The manifestation of a higher level of consciousness is prevented, according to Vedic philosophy, by *ahamkara* (ego). In the model presented here, conduct-deluding karma colours the knowledge that is output by the cognition process. The passions, of which ego is one part, included in this karma compares to *ahamkara*. Conduct-deluding karma therefore obstructs the attainment of higher level of consciousness. When *ahamkara* is eliminated or reduced to a lower level, higher consciousness manifests.

Active perception-deluding karma puts a label on the soul, in a way, so the soul considers itself branded. The worst brand is *mithyatva*, in which the soul considers itself to be only a material body and has no faith in a spiritual existence. There are two aspects of perception: perception of the self and perception of other souls. The perception of other beings is guided by the principles of *upadaana*, the main cause, and *nimitta*, the auxiliary cause. Our perception of another person depends on both our label and the label and performance of that person. So this kind of perception is a complex phenomenon that creates different perceptions of a given person depending on the person who is doing the perceiving.

18. The *buddhi* is heavily influenced by *ahamkara*. *Ahamkara* corrupts the *buddhi* and prevents it from taking intelligent decisions.
19. The thinking activity of the mind (*manah*) is affected by the *ahamkara* and *ajnana*. The thoughts of a common person are constricted by *ajnana* and biased by *ahamkara* and therefore describe only the relative truth. The soul cannot perceive the absolute truth with the help of the mind. It is only when the mind is absent, with the elimination of psychical karma in the omniscient state, that the soul perceives the absolute truth.

20. What is *bhava*? The term *bhava* is used in different contexts. It may mean mental feeling or refer to the overall state of the soul. Feelings are produced by the fruition of feeling-producing (*vedaniya*) karma. These feelings are influenced by passions, quasi-passions, and by vitality-obstructing (*antaraya*) karma. Therefore *bhava* can be described as the psychic state of the soul that is produced by the combined effect of feeling-producing karma, conduct *mohaniya* karma and vitality-obstructing karma. In this case the *bhavas* are impure. When the conduct *mohaniya* and vitality-obstructing karma are eliminated in the omniscient state, the *bhava* are reduced to pure feelings. A liberated soul with no karma also has no feelings.
21. *Citta* (psyche) is another concept used in the psychological study of the soul. *Citta* is different from mind; it is supposed to be the controller of the mind. *Citta* is the consciousness of the soul working with the body; the mind is the instrument through which the consciousness of *citta* is manifested in the body. The mind is the working medium and *citta* is the working consciousness. The mind cannot be steadied, but *citta* can be in steady state. Different states of mind, such as concentration and unsteadiness, depend on *citta*. *Citta* is as permanent as the mundane soul, but the mind is temporary; the existence of the mind is need-based, so it is absent when not needed.
- Citta* is related to *bhava* karma; it is the state of the soul created by the incidence of *bhava* karma. *Citta* can be divided into three parts: *adhyavasaya* (spiritual vibrations), *bhava*, and *buddhi*. These three parts work jointly or individually, depending on the function that is being performed by the soul. The transitory state of *citta* is due to psychical karmas; once these are eliminated in the omniscient state, the *citta* becomes calm and tranquil. In the non-omniscient state the *citta* can also be calmed temporarily through meditation and the suppression of passions and quasi-passions. The *citta* ceases to exist in the liberated state, when all karmas are absent.
22. The *kevalajnana* and *kevaladarshana* valves open when the deluding and *jnana*-, *darshana* and vitality-obscuring karmas are

completely eliminated. This has two effects. First, there is no obstruction to the flow of *jnana* and *darshana* energies, which now flow at their ideal rates. This means that the intellect and *buddhi* can assume infinite proportions. Second, cognition takes place with full efficiency and without any colour, so that perception is pure, perfect and absolutely objective.

What happens to the earlier knowledge and memory bank in the omniscient state? Perhaps with the elimination of deluding karma this perverted structure is destroyed and the memory bank (*ajnana*) ceases to exist. The omniscient has no use of the previous memories: with its infinite intelligence, the omniscient soul cognizes any object instantaneously without any thinking or bias. It experiences the absolute truth, which is revealed intuitively and spontaneously in its conscious mind.

4.7 Delayed Cognition: Intuition

We mentioned above that the manifested *jnana* and *darshana* energy that does not participate in the current cognition process may be sent to reservoirs in the soul and stored for future use. When an occasion arises in the future in which the effect of *antaraya* karma is reduced and time is favourable, these dormant energies may suddenly affect the cognition process and generate new knowledge. This may be called delayed cognition. This is perhaps the reason that we sometimes get sudden insights without any intentional effort, in which ideas that may provide the answer to some problem we have been trying to solve are revealed to us. Such events provide a spark that may sometimes change our outlook and vision and the way in which we live. What is implied here is that soul energies are not wasted; if not used immediately, they may wait for the opportune time and occasion to produce some kind of result. This could be called intuition. Intuition, then, means the use of unutilized but processed soul energies to receive insight. This does not require further *ksayopashama* of karma; it takes place naturally on account of efforts made in the past.

The above model is a simplified representation of the cognition process that takes place in common individuals. The model can be improved by accounting for the assumptions that have been made. For example, in the next stage of research the role of passions and quasi-

passions, which are parts of conduct *mohaniya* karma, can be modeled to study their role in the generation of knowledge.

4.8 Science and Philosophy

Scientific explorations of nature are based on experimental investigations and theoretical analyses of phenomena. Here the objective view prevails over the subjective view, as the findings are confirmed and reconfirmed for their validity. In this situation, *buddhi* is supposed to play the main role; mind (*manah*) remains in the background and is used primarily for thinking and imagining alternative ways to attack and solve the problem in hand. Philosophy, on the other hand, takes the help of arguments to reach a conclusion in a particular case that involves broad thinking and imagination in addition to subjective personal experiences. Philosophy thus appears to be primarily an act of the mind, while *buddhi* is a component of the mind that helps in the process of thinking and advancing arguments.

This proposition helps in the comparison of scientific and philosophical approaches. A scientific approach that is not influenced by conduct-deluding karma would be free of the personal background of the investigator. However, his or her perceptions would still be coloured by view-deluding karma and therefore would be relative in nature. Previous knowledge (or ignorance) is a factor in the mental processes of the mind, but *buddhi* is the primary force in arriving at the final conclusion. For this reason scientific findings cut across cultures and take a universal form. This means that scientific conclusions based on a set of experiments conducted in the East or West shall be the same. Philosophy, on the other hand, is biased by personal conduct and personal knowledge. Philosophical arguments tend to vary across individuals and have strong cultural influences. For example, Sigmund Freud considered sexual desires to be the main cause of the unconscious; a similar study conducted in India might have given another cause, e.g. *samskara*, for the same phenomena. This makes it difficult for philosophy to reach a consensus; differences may continue to exist between different thinkers. However, both scientific knowledge and philosophical knowledge fall into the domain of empirical knowledge, *matijnana*, as the soul acquires this knowledge through the mind and senses.

The interaction of science and philosophy can be gainful for our overall development. Philosophy presents a wide spectrum of thoughts that can stimulate scientific research in a new direction. Philosophy can also be more satisfying to individuals as it is nearer to the mind (*manah*) and may meet some of their aspirations. Science provides new grounds to philosophy for further arguments, giving it a dynamic character.

4.9 Conclusions

Jnana and *darshana* are two components of the cognition process. Knowledge, which is seen as a structural distortion in the soul, relates to the cognition of external objects. The cognition efficiency depends on the *ksayopashama* level of the perception *mohaniya* karma and *antaraya* karma. Knowledge is coloured by perception *mohaniya* karma and conduct *mohaniya* karma before it becomes a part of the memory bank, *ajnana*. The model of the cognition system that has been presented here helps to conceptualize the (virtual) structure of the soul, identify the effects of different psychical karmas on the cognition process and activities of the soul, and define terms like *manah*, *buddhi*, *ahamkara*, *bhava* and *citta*.

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Biological Intelligence and the Human Faculties

5.1 Introduction

Modern biology now admits that living organisms are dynamically complex functional entities that are not reducible to simple mechanical or chemical descriptions. Barbara McClintock [1] demonstrated that organisms can engineer their own DNA. Shapiro [2] claims that the whole organism engineers the modification of its own genetic structure in response to stress or to achieve a goal. He concludes that cognitive intelligence is necessary to properly explain the behavior of cellular and genetic processes. It can, therefore, be deduced philosophically from the Science of Logic that cognition, consciousness or sentience is the immediate existential Concept of life, and that intelligence is a necessary feature of organisms. Jainism distinguishes between the body of a living organism, *sachita*, and the body of a dead organism, *achita*, indicating that the *sachita* body has consciousness or intelligence-like features while the *achita* does not.

It is generally accepted by many scientists that matter, the constituent of the body, does not possess intelligence. The question, then, is: what is the source of intelligence in the body of an organism? Jainism propounds that intelligence is a property of the soul and not matter. How is the intelligence of the soul transferred to the matter, the body? Here I present a possible model in which the intelligence of the soul is induced in the karma, which then becomes an intelligent force and an agent for the intelligent accomplishment of the psychical, biological and physiological processes in the body. I propose the concept of soul faculties, which will facilitate the scientific study of the empirical soul. In the dictionary, “faculty” is defined as the psychical or soul capacity for any natural function. The soul’s activities, such as knowledge, feeling, volition, intelligent endowment or gift, and power are recognized as the faculties of the soul.

In the end of this chapter, biological structures are classified on the basis of applied intelligence; it is argued that all such structures, both natural and artificial, are the result of the application of soul intelligence to matter.

5.2 Empirical Soul in Jainism

In the previous chapters we discussed the soul, *dravya* karma, and *bhava* karma. *Dravya* karma is comprised of *karman vargana*, which is supposed to be subtle matter in the form of an energy field; it may exist as some kind of plasma-like form in the body [3]. *Bhava* karma is impurity of the soul, which is some mode of the soul itself that determines its state in worldly existence. There are two ways to describe the soul, as given in Chapter 1: the absolute way, or *nischayanaya*, and the empirical way, or *vyavaharanaya*. In the absolute way, in any empirical soul the pure soul is distinguished from the impurity, *bhava* karma, as shown in Figure 1. It is then supposed that during any soul transformation all changes take place in the impurity, the *bhava* karma, and the pure soul is unaffected. When all of the karmas are eliminated, the pure soul without impurity is said to be liberated; the cause of its empirical existence is now absent.

In its empirical existence the soul possesses three bodies: the karma body, the *tejas* body, and the gross material body. The non-physical soul extends throughout the space of the physical body and is the causal part of the system in the sense that it is because of the soul that other bodies exist. Being non-physical the soul has no physical contact with the other bodies, but it is still linked to all of the bodies so that together they constitute a system. The linkages between the various components of the system are shown in Figure 1. The *bhava* karma of the soul and the karma body (*dravya* karma) are linked by the principle of parallelism. The karma body is linked to the gross body through radiations known as *adhyavasaya* and *lesya*. In this system of three basic units, i.e. empirical soul, karma body (and *tejas* body), and gross body, because of interactions and interrelations, a change in any one unit affects the other units and therefore the whole system.

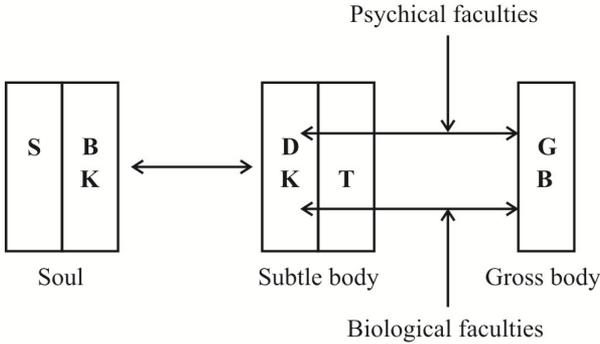


Figure 1 Empirical Soul: S -Soul (pure), BK – *Bhava* karma, DK – *Dravya* karma, T – *Tejas* body, GB – Gross body

The soul and the matter of the gross and karma bodies possess individual properties which are important parameters for their change, but they are also affected by changes in other units of the system. Therefore, in order to study the performance of any one unit it is necessary to know the changes taking place in and the performance of the other units. They are interdependent and cannot be studied in isolation. Their interrelations and interactions are important, without which the study is incomplete. This is the reason that biological studies of organisms need to assume the existence of intelligence in order to explain phenomena and processes taking place in the body. To understand the performance of the gross body it is necessary to know about the soul and the karma processes. Similarly, to know about the transformations in the soul it is necessary to understand the biological processes and the actions of karma.

Whereas Jainism emphasizes the link between the empirical soul and karma and only sparsely refers to processes in the gross body, scientific studies of the system lack the capability to deal with the non-physical soul directly. It is possible to deal scientifically with the sub-system consisting of the karma body and the gross body, as both are physical in nature – although science has not yet discovered laws for the subtle matter of the karma body, which at present cannot be described by the known laws of science.

The concept of soul faculty helps to establish a link between the empirical soul and karma, and via karma to the gross body. This enables

us to integrate the system in a holistic way and study the system's performance during any transition. This concept can be expanded further to detail the interactions between the components of the system and scientifically understand the role of each component in the system's overall performance. This study is restricted to human souls with empirical and articulate knowledge and indirect perception.

5.3 Intelligent Processes

The changes in the state of the soul and in karma are of two different kinds. The soul experiences transformation and is itself the main cause for these changes; karma is the auxiliary cause. As a soul possesses intelligence, it responds to changes in karma intelligently. Karma either bonds or rises (or experiences fruition): these processes are physical and may follow some (still unknown) laws of the physical sciences without any element of natural intelligence. The activities of the soul and karma take place continuously.

For example, let us presume that at any instant the soul is in state S1 and karma is in state K1, as shown in Figure 2. The changes in states S1 and K1 may be brought about by either a change in S1 or a change in K1. A change in S1 is caused by soul processes such as annihilation, subsidence, or annihilation-cum-subsidence of *bhava* karma, that happen on the initiative of the soul. A change in K1 takes place either by the bonding of new karma or the rise of existing karma. In both cases, yoga, activities of the mind, speech and/or body, and *kashaya*, emotions and passions, participate in the process. In the case of bonding, these are the cause of the changes; in the case of rise, they are the effects of the changes.

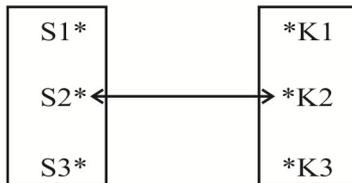


Figure 2 Soul – Karma system

First let us consider the case in which the changes are initiated by the bonding of new karma and the state of the karma body changes from

K1 to K2 through the activities of yoga and *kashaya*. To balance the karma, the state of the soul automatically changes from S1 to S2. The soul responds intelligently to this initial change and then changes its own state from S2 to S3, say by the process of annihilation-cum-suppression, which is common to most souls. Corresponding to this change, the karma state now becomes K3. The change in karma from K2 to K3 will also be associated with some activity of yoga and *kashaya*, but this activity will be marked by intelligence (meaning that this change will be brought about intelligently).

In the process just described, K2 and S2 are temporary, intermediate stages. In practice, the karma state changes from K1 to K3 and the soul state from S1 to S3, meaning that the two processes occur simultaneously; the soul responds intelligently to the change in the karma states, so this change has an element of the soul's intelligence. Thus the temporal transformation in the karma states is subjective and not objective or based on physical laws only. This also means that it is not possible to describe the temporal transformations in the karma body by the laws of the physical sciences alone; there is a component of subjectivity (signifying intelligence), which is not a natural property of karma matter. The temporal karma processes are not merely a physical principle; because of karma's association with the soul, they are also intelligent and therefore different from other natural physical processes which are objective and devoid of intelligence.

The transformations that take place with the rise of karma are similar to those that happen with the bonding of karma – except that the rise of karma causes the activities of yoga and *kasaya* to take place in the gross body. In both cases, the change is initiated by a change in *dravya* karma, followed by changes in *bhava* karma. However, there are some exceptions. In the case of the soul processes of annihilation, suppression or annihilation-cum-suppression of karma, the change starts with the *bhava* karma, followed by the *dravya* karma. This basic model applies to all cases of changes in karma and hence to all transformations in the soul.

In the system shown in Figure 1, the physical bodies (the karma and gross bodies) work on two principles: first, the principles of the physical sciences for the material they are made of; and second, the intelligence of the soul that flows to the physical bodies through the

temporal changes in karma. Intelligence is supposed to have the role of regulating these physical processes. This means that although the work is done by the physical units, the directions are provided by the faculties of the soul. By this consideration, the physical units are slaves and the soul, through its faculties, is the master. The physical units, through genes, know “how to do” and the master knows “what to do.” Together, the two manage the system. Both the soul and the physical units are essential for the system to function.

The type and quality of work that is done depends on the skill of the slaves. For high-quality output, high skill is required. This explains the role of genes in the gross body. Low-quality genes produce a low level of structure; high-quality genes produce a superior structure. This means that the genes in human beings are of a superior quality to those of animals. By the same logic, the genes in one-sense beings are of the lowest quality. This also implies that the genes of lower beings cannot accomplish the functions that are required in higher organisms. The intelligence required to direct the work of the slaves depends on their skill. The higher the skill, the more intelligence is required to provide proper directions. The human soul, therefore, manifests more intelligence as faculties than animal souls do. This points to the compatibility of the system components; all components of the system must maintain appropriate standards for the system to function efficiently in the desired way. The soul and the physical units together determine the performance of the system.

For successful operation of the system, the directions have to be in real time. We mentioned earlier that the karma body is a form of energy field, implying that its processes are likely to take place at the speed of light. The directions, therefore, should be at least as fast as the karma processes. This is a pointer to the level of intelligence of the soul that can function at that high speed. In Jainism, the soul is supposed to possess infinite intelligence, not all of which is manifested in normal human beings; still, the level of manifested intelligence is mind-boggling.

5.4 Faculties of the Soul

Eight types of karma are defined in Jainism; at any moment, the karma undergoing change could be any of these eight types. Although the consciousness of the soul is one, it manifests in eight different qualities: *kevalajnana* (omniscience), *kevaladarshana* (pure and perfect

awareness), *atmikasukha* (self-bliss), *anantaviryā* (unfettered and unrestricted spiritual energy), *ksayikasamyaktva* (possession of complete truth), *atal-avagahana* (eternal unchanging existence), *amurtatva* (total formlessness), and *agurulaghutva* (permanence and total parity with other pure souls). The karmas that veil these qualities of the soul have corresponding names, as shown in Table 1. The qualities of the soul are not fully obscured by karma: a small fraction always manifests. The manifested quality represents the corresponding “intelligence” of the soul. For instance, manifested *jnana* is the knowing intelligence of the soul and manifested *darshana* is its perceiving intelligence. These intelligent qualities are reflected in the karma by the method described in Section 5.3, which represents the “intelligent” physical force that works in the physical body of the organism. This working, intelligent physical force is called a faculty of the soul.

Table 1 Faculties of the Empirical Soul

<i>No.</i>	<i>Quality of Soul</i>	<i>Karma</i>	<i>Faculty of the Empirical Soul</i>
1	<i>Kevalajnan</i>	<i>Jnanavaraniya</i> karma	Faculty of knowing
2	<i>Kevaladarshana</i>	<i>Darsanavaraniya</i> karma	Faculty of awareness
3	<i>Atmikasukha</i>	<i>Vedaniya</i> karma	Faculty of feeling
4	<i>Anantaviryā</i>	<i>Antaraya</i> karma	Faculty of attitude (positive or negative)
5	<i>Ksayikasamyaktva</i>	<i>Mohaniya</i> karma	Faculties of perception and of equanimity, volition and desire
6	<i>Atalavagahana</i>	<i>Ayusya</i> karma	Faculty of life force
7	<i>Amurtatva</i>	<i>Naama</i> karma	Faculty of organism design and creation
8	<i>Agurulaghutva</i>	<i>Gotra</i> karma	Faculty of the quality of actions

As shown in Table 1, there are eight faculties of the empirical soul, corresponding to the eight qualities of the soul. These faculties are:

1. *Faculty of knowing.* By this faculty, the soul acquires knowledge of an object. The greater the *jnanavaraniya* karma, the less developed the faculty of knowing and the cognition ability of the soul.
2. *Faculty of awareness.* By this faculty, the soul becomes aware of the self and of the environment. The greater the *darsanavaraniya* karma, the more limited the faculty of awareness and vice versa.
3. *Faculty of feeling.* The soul senses and experiences pleasure on the rise of *satavedaniya* karma and pain on the rise of *asatavedaniya* karma; the intensity of pleasure and pain depends on the magnitude and rate of the rising karma.
4. *Faculty of attitude.* When *antaraya* karmas are on rise, the soul has a negative attitude toward life. When *antaraya* karmas are not on rise, the soul has a positive attitude.
5. *Faculties of perception and of equanimity, volition and desire.* This faculty can be divided into two parts based on the two subtypes of *mohaniya* karma.
 - a. False perception on the rise of *darshanamohaniya* karma. The intelligence of the soul is not able to perceive the truth, so perception is biased.
 - b. Imperfect practice on the rise of *charitramohaniya* karma. The soul is not able to practice free of passions, emotions and desires. Its conduct is guided by desires and passions, and such conduct is at variance with the true nature of the soul and its knowledge and awareness ability.

Both of these faculties affect the soul's equanimity of conduct; the more karmas that are on rise, the farther from equanimity the conduct becomes.

6. *Faculty of life force.* This faculty provides the life force for the being and exists as long as *ayusya* karma is in balance. Without this faculty, life is not possible in the organism.
7. *Faculty of organism design and creation.* This faculty provides the intelligent physical force for designing and creating the body structure of the organism, just like an artist conceives and creates a painting. This faculty is the force and intelligence behind the

formation of organisms of various species and their body structures, i.e. the force for biological and physiological processes in organic beings.

8. *Faculty of quality.* This faculty controls the quality of both the structure and actions of the organism. When high *gotra* karma is on rise, the organism's quality and performance is high; when low *gotra* karma is on rise, the quality and performance is low.

All eight faculties work together and jointly determine the personality and performance of the empirical soul. The eight faculties, their subtypes and their grades, defined by divisions similar to those of karma, combine in a very large number, perhaps infinite, of ways so that each soul is unique in practice.

For comparison, it is worth mentioning that Aristotle [4] described five faculties: (1) the vegetative faculty, concerned with the maintenance and development of organic life; (2) the appetite, or the tendency to any good; (3) the faculty of sense perception; (4) the locomotive faculty, which presides over the various bodily movements; and (5) reason.

We can also divide the faculties into two groups, based on two divisions of karma.

1. *Psychical or external faculties.* These faculties concern the psychical performance of the soul and are the means whereby it interacts with external objects. These include the faculty of knowing; faculty of awareness; faculty of equanimity, volition and desire; and the faculty of attitude. These faculties are expressed externally and can be measured if suitable ways can be devised. They operate through the mind, which has a large bearing on their functioning. When the psychical karmas are annihilated, these faculties cease to exist and the natural qualities of the soul that were obscured by these karmas manifest in their true form.
2. *Biological or internal faculties.* These faculties concern the biological and physiological functions of the empirical soul. They include the faculty of feeling; faculty of life force; faculty of designing and creation; and the faculty of quality. These faculties are internal and we are not consciously aware of them. They work

on an involuntary basis and are not accessible to the mind, which is a product of the psychical faculties. These faculties remain in existence even after the psychical karmas are eliminated. They cease to exist on liberation.

The performance and behavior of the soul is guided by both the psychical and biological faculties. The function of the psychical faculties, which generally operate through the conscious mind, in determining our performance is clearly understood. The activities of cognition, perception, feeling and willing, thinking and imagining, etc. is all guided by the psychical faculties. However, the biological faculties primarily concern the biological functions, which also influence our performance.

The concept of faculties of the soul has two advantages. First, instead of dealing with a system composed of the non-physical soul and physical body, which is difficult to analyze, the task is reduced to dealing with only the physical faculties and the physical body. Second, the processes and phenomena in the revised system are amenable to scientific analysis. We must remember that the intelligence and subjectivity of the soul is accounted for in defining the faculties. This concept of psychical faculties can help in the study of the psychology of human beings. The internal biological faculties help in explaining the biological and physiological processes taking place in organisms. In this chapter, we consider only the biological and physiological processes; the psychical processes are studied in the last chapter.

The sequence of activities that take place in the operation of the life system is shown in Figure 3. Yoga, activity of the mind, speech and body (senses), causes the bonding of *dravya* karma at state K1. This action is reflected in the *bhava* karma of the soul. The soul responds intelligently based on its constituent structure, including *kashaya*, and changes from S1 to S2. This change in *bhava* karma changes the state of *dravya* karma to K2, and the concerned faculty forces direct Activity 2 in the body – which, at the same time, also has input from the biological response of the gross body.

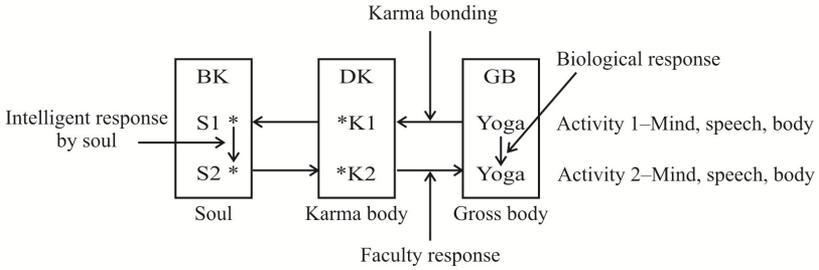


Figure 3 Operation of the Life System

There are two determinants of Activity 2: (1) the biological response to Activity 1, based on physical principles; and (2) the directives of the soul through the faculties. The resulting Activity 2 is, therefore, a complex subjective phenomenon and may not be predicted by known rules of physical science. This process proceeds at a fast rate, almost instantaneously, and we experience these Activities in a continuous manner. If the response of the soul and the biological response are similar, Activity 2 may appear as the logical, scientific outcome of Activity 1. If the soul response is not the same as the biological response, Activity 2 may be different from what is expected according to the physical sciences. Thus the effect of the soul's subjectivity may not always be discernable, although it always exists. The system's performance is determined by two kinds of responses: (1) the physical, matter; and (2) the sentient, spiritual. In case of match of the two responses, order may be maintained in the system; a mismatch may produce disorder.

We must distinguish between karma and faculty. Note that karma is bi-directional in its operation; it is affected by the activities of the mind, speech and body and also affects these activities. The faculty of the soul is unidirectional: it affects the activity of mind, speech and body, but not vice versa.

The activities, and hence the performance, of the soul are influenced by the environment. Scientific findings also show a relationship between genetic performance and the environment. Scientists now recognize that both genes and the environment influence behavior [5]. Genes, via their influences on morphology and physiology,

create a framework with which the environment acts to shape the behavior of the individual animal. The environment can affect morphological and physiological development; in turn, behavior develops as a result of the organism's shape and internal workings. Genes also create the scaffold for learning, memory, and cognition: mechanisms that allow animals to acquire and store information about their environment that they then use to shape their behavior. Much behavioral genetic research today focuses on identifying the genes that affect behavior such as personality and intelligence, and disorders such as autism, hyperactivity, depression, and schizophrenia.

Epigenetics is another emerging field in the study of behavior [6]. Epigenetics concerns stability heritable phenotype resulting from changes in a chromosome without alterations in the DNA sequence. "Epigenetic changes can modify the activation of certain genes, but not the DNA sequence itself. Additionally, the chromatin proteins (around which DNA is wrapped) may be activated or silenced. This is why the differentiated cells in a multi-cellular organism express only the genes that are necessary for their own activity. Epigenetic changes are preserved when cells divide."

The activation of genes is caused by signals coming from some source. There are two possible sources: the biological faculties and the environment. Karma radiation is an internal source that sends signals directly to cells to initiate changes in the DNA protein, thereby regulating the selective functioning of DNA. The environment is an external source, which acts through the senses and the mind; the signals from this interaction are generated in the brain. Scientists are aware of this environmental source, but are unaware of the biological faculties, which, in addition to the psychical faculties, may be the main force behind our behavior.

"Behavioral epigenetics is the field of study examining the role of epigenetics in shaping animal and human behavior." [7] "Epigenetic changes can influence the growth of neurons in the developing brain as well as modify the activity of the neurons in the adult brain. Together, these epigenetic changes in neuron structure and function can have a marked influence on an organism's behavior."

5.5 Some Intelligent Biological Processes

All four kinds of internal faculties are at work in the organization and coordination of organisms' biological and physiological processes. The physical part of an organism's system can be assumed to consist of two major constituents, matter and faculties, and their interactions. Science has studied matter, but it has yet to offer explanations for many of the phenomena which take place intelligently in the body. In this section, I mention some examples for the purpose of illustration and to see how the introduction of this concept of faculty helps to find possible explanations of intelligent biological processes.

There are examples of biologists finding physical forces inadequate to explain physiological processes, leading them to speculate about the presence of some hidden intelligent force that produces biological structures. Some scientific findings corroborate the existence of karma-like forces to explain the processes taking place in cells.

Scientists have long been in search of the rules of the ordered form of morphological structures such as organs. This gave birth to the idea of the morphogenetic field in the 1920s. "This field was defined as a collection of cells that are able to respond to discrete, localized biochemical signals leading to the development of specific morphological structures or organs." These fields have definite boundaries, and the organ will form only from the interactions of cells within the field. The cells within this field could regulate the formation of structures.

Rupert Sheldrake [8] proposed that there is a field within and around a morphic unit that organizes its characteristic structure and patterns of activity. He writes that "we know what DNA does: it codes for the sequence of amino acids, which form proteins. However, there is a big difference between coding for the structure of a protein and programming the development of an entire organism. It is the difference between making bricks and building a house out of the bricks. You need the bricks to build the house. If you have defective bricks, the house will be defective. But the plan of the house is not contained in the bricks, or the wires, or the beams, or the cement. Analogously, DNA only codes for the materials from which the body is constructed: the enzymes, the structural proteins, and so forth. There is no evidence that it also codes for the plan, the cells of the body. DNA alone cannot explain the difference in form; something else is necessary to explain it. "

Sheldrake is of the view that “heredity depends not only on DNA, which enables organisms to build the right chemical building blocks (the proteins), but also on morphic resonance. Heredity thus has two aspects: one a genetic heredity, which accounts for the inheritance of proteins through DNA's control of protein synthesis; the second a form of heredity based on morphic fields (implying the faculty of design and quality) and morphic resonance, which is non-genetic and is inherited directly from the fields of past members of the species. This latter form of heredity deals with the organization of form and behaviour.”

The idea of a morphogenetic field is clearly similar to the *naama* karma of Jainism. The *naama* karmas contain plans for the form of all organisms, rather than the plan for just one species as stated by the theory of morphogenetic fields. The idea of fields-within-fields to create organs, starting from a single cell, is acceptable to Jainism, as evinced by the various types of *naama* karma. The scope of *naama* karma covers all the realms of existence, viz. animals, human beings, infernal beings, heavenly beings, and all species or types of organisms. However, the idea of cosmic morphic fields that contain plans of forms, as proposed by Sheldrake, is not acceptable to Jainism. Jainism holds that the plans are contained in the *naama* karma carried by each individual organism. In the scheme of *naama* karma, there is no need for a concept like Sheldrake's morphic fields to derive the forms of organisms from a source outside the body.

Assuming that *naama* karmas contain plans for all organisms, how is the body of an organism of a particular species formed? The plan selection is perhaps made by *ayusya* karma or the life force faculty. This means that, from a general pool of morphological plans carried by the organism, the *ayusya* karma accesses the particular plan needed to form the structure of that particular species to which the organism now belongs. The *ayusya* karma is bonded for one birth only; that is, the *ayusya* karma that we bond in this life decides our form in only the next birth and not thereafter. This gives the *jiva* freedom to have the form of a different species in each birth. Thus the system of general morphological plans works successfully, and the plan for the selected species, as per the bonded *ayusya* karma, is applied by the *jiva* in each birth.

There is a vast difference between making a house and forming a body. To build a house we need many kinds of materials made by different agencies, e.g. bricks, cement, mortar, steel, timber, pipes, wires, and cables. In the formation of a body the only material required from the outside is food and water; all other components are made in the body itself. The body makes components like flesh, blood, bones, and fluids at the right place, in the right size and shape, at the right time and in the right way out of the elements contained in food and water so efficiently and precisely that it can only be called a marvel from the standard of present scientific knowledge. Can this happen without intelligence? Certainly, it is the intelligence of the biological faculties that makes this extraordinary feat possible. It is not possible with present-day scientific knowledge to accomplish a similar task outside of the body.

For another example, let us consider the important scientific discovery of bio-photons. It is now well established that all living systems emit a weak light current of some photons. Scientists have found that the nature of this weak light emitted by living cells is different from sunlight. They called these light photons “bio-photons.”

The pioneering work done by Fritz-Albert Popp [9, 10] has given deep insight into the phenomenon of bio-photon emission. According to him, “the purely molecular aspect of life sciences may only be one step toward understanding biology, and can never reach a sufficient and complete explanation. Molecules have no intelligence, despite the manifold impressive functions that have been assigned to them. Even enzymes or messenger molecules have to be triggered by some external energy, i.e. photons, which activate the diversion transition state complexes. The non-thermal photons provide the right quantum energies at the right place and right time to trigger the millions of reactions per second per cell.” “Thus, one has to stress that (1) it is impossible that thermal photons may trigger the biochemical reactions in a living system, and (2) theoretically, one photon per cell could be sufficient for activating 10^9 reactions per second, provided that it originates from a coherent photon field. If this field is coherent and non-thermal, it theoretically should be able to borrow the photon energy at the right time, take it to the right location for the reaction, and reabsorb it

immediately after the reaction(which, in general, takes no longer than about 10^{-9} seconds).”

“Popp found that a living organism possesses a living aura, a virtual electromagnetic field that pervades the entire organism with a virtual photonic flux. In this field, virtual photons are stored. The field continually receives virtual input from the environment and is continually outputting bio-photons, particularly in the near-ultraviolet wavelengths. This field, in which all cells are bathed and with which they continually intercommunicate, tends to stabilize and cohere the organism. All this has been established by laboratory experiments.”

“Bio-photon emission is indicative of an endogenous, innate, electromagnetic field that pervades the entire organism and which may act as both sender and receiver of the bio-photons that are "electromagnetic bio- information" used in regulating life processes.” These observations, among others, suggest that there is a form of control, possibly electromagnetic in nature, within the living state. “From the bio-physical point of view, bio-photons regulate the complex functions of the body.”

There is a great similarity between *adhyvasaya* and bio photons [11]. It is now easy to understand the source of intelligence in bio-photons: it comes from the soul through *naama* karma, or the faculty of design and creation.

The genes carry all of the instructions for making proteins. Only a part of the total instructions are used at any particular location of the body: a cell suitable to that location is made by the genes. Who selects the set of instructions to be followed? According to Jain doctrine, such decisions must be assigned to the faculty of design and creation. The DNA in every cell is identical, but each cell performs differently and produces a variety of proteins in different parts of the body. This selective functioning of the DNA is possible due to karma. There is laboratory evidence that DNA can be influenced and reprogrammed by radio and light frequencies [12]. The karma radiation in each gene is identical, but works selectively. It must regulate the non-protein-making part of genes through the process of selection and determine the function of the cell as appropriate for its location in the body. In this manner, the

performance of the body at the cellular level must be regulated by the soul's intelligence through the faculty of design and creation.

Guenter Albrecht-Buehler [13] claims that 30 years of his research on the cell has shown that mammalian cells possess intelligence. "An intelligent cell contains a compartment that is capable of collecting and integrating a variety of physically different and unforeseeable signals as the basis of problem-solving decisions." G.de Purucker [14] wrote about life atoms, centrosomes, and centrioles many years ago. He stated, "In each cell there is a central *pranic* nucleus which is the life-germ of a life-atom, and all the rest of the cell is merely the carpentry of the cell built around it by the forces flowing forth from the heart of this life-atom." A life-atom is a consciousness-point. Intelligence, according to Jain philosophy, means the presence of faculty forces in the cell. The faculties exercise control over the working of the genes and the cell functions. There is a central authority (the soul) that monitors, coordinates and controls the activities of individual cells as well as groups of cells like tissues or organs, so that each cell or group of cells performs according to the plan contained in the karma body in an integrated manner. The intelligence of the soul manifested through the faculties constructs the body according to the blueprints contained in the karma body.

These are some examples of how the intelligence of the soul participates in biological processes through the faculties of design and life-force. The faculty of life-force is also expected to be responsible for the organism's *prana*, which is considered essential for life. *Prana* has the property of joining things; it joins atoms together [15]. *Manah* (mind), *prana*, and *vaka* (the force behind speech) exist together, but only *prana* has the property of joining. We know that when *prana* leaves the body at the time of death, the body decomposes. This indicates that *prana* was holding the material atoms together. *Prana* follows *manah*. *Prana* can be transferred from one body to another; it flows from a high potency body to a low potency body. One *prana* can do only one function at a time; this is why, according to Jainism, there are ten *pranas* for the ten different functions in the body. The faculty of quality may be associated with the mutation of genes, a process by which a change in the

quality of the genes takes place. However, these propositions are only speculation at present; further research is required to confirm them.

The above examples of intelligent biological processes establish the proposition that the constituents of the physical body, though “skilled,” are slaves of the intelligent master, the soul. This leads to some important inferences:

1. Assuming that they are being directed, the slaves each have an individual existence. This means that the body’s components and constituents can be manipulated independently of the soul, to some extent. This, in fact, is the approach of medical science.
2. The soul responds intelligently to these changes in the body, including gene manipulation. These changes may or may not be accepted by the soul.
3. The response of the (life) system to changes in the body cannot be predicted because of the subjective response from the soul. The success of scientific experiments on the body, particularly pertaining to fundamental changes in its structure, is therefore uncertain.

These inferences have important implications for bio-medical science and research.

Cognitive biology [16] examines biological structures to discern their epistemological functions. “It has grown out of molecular biology with the assumption that the elucidation of molecular recognition, the processing of molecular signals, the organization of the gene network, and protein computations may provide a clue to understanding higher cognitive processes.” “This knowledge is supposed to be embodied in the construction of organisms and their structural complexity. Cognitive biology considers biological evolution as a progressive process of the accumulation of knowledge.”

Following the work of Barbara McClintok, Shapiro concludes that cognitive intelligence is necessary to properly explain the behavior of cellular and genomic processes. Now that it is being recognized that cellular processes are cognitive, it can be deduced philosophically from the *Science of Logic* that cognition, consciousness or sentience is the immediate existential concept of life. This confirms that intelligence is a

necessary feature of organisms and points to the role of a subject, which is a well defined concept in Jain philosophy. According to Jain philosophy, biological faculties have an important role in the formation of biological structures. The complexity of these structures depends on the manifested intelligence of the soul, but the structures themselves are not the source of intelligence. Intelligence and consciousness can in no way be reduced to materialistic properties. The subjective role of consciousness is likely to be a defining feature of new biology.

5.6 Biological Structures

Biological structures are physical structures composed of organic compounds that form constituent life support systems. The simplest types of structures are amino acids, which form the polymeric building blocks of life. Advances in biology and medical sciences have made it possible to create artificial biological structures like cells, tissues, meat, organs and clones. Some scholars see this as a challenge to the doctrine of karma and hence to the existence of the soul. This is not correct. All of these advancements have in fact been made by the power of the human mind, which is the embodiment of the soul's intelligence. The intelligence of the soul is ingeniously used to manipulate the organizing capacity of *puḍgala* (matter) to create useful artificial biological structures, which otherwise are created naturally by the faculties of the soul in the development of the bodies of organisms. These structures, artificial or natural, are the products of the intelligence of the soul and should not raise any doubt about the existence of the soul or the doctrine of karma. The quality of the structures, however, is dependent on the efficiency of the utilization of the manifested soul intelligence, which is very high in natural processes compared to artificial processes.

Based on the mode of the application of intelligence, we can classify biological structures into the following three categories:

1. *Simple structures formed without human intelligence.* The amino acids formed spontaneously in the environment under appropriate conditions, as shown by the Miller– Urey experiments [17], are structures formed without the application of human intelligence. These are said to be essential conditions for the development of life. These chemical compounds are the result of the organizing

capacity of material molecules under specific conditions. This kind of organization of molecules cannot be considered an intelligent act, as it does not require human intervention.

2. *Biological structures obtained with the application of the human mind.* All of our mental acts are the consequences of the application of a psychical faculty. The human mind is the carrier of psychical intelligence and can be employed in various ways to produce complicated biological structures out of simple structures. These structures are of four kinds:
 - a. Structures such as nucleic acids and proteins synthesized in a laboratory starting from simple organic compounds. In the limit it is possible to synthesize a cell and produce agglomerates of cells as artificial meat. Producing a synthesized cell has been a long journey for scientists because it requires a high order of intelligence that is not possible in the first attempt; our mind functions in an incremental way, improving a bit each time.
 - b. Structures produced externally starting from a cell. Living cells, which are part of a body, possess some biological intelligence (of the soul). Starting from this level, more complicated structures can be produced with the application of psychical intelligence. All *in vitro* stem-cell research falls in this category. With the further application of psychical intelligence, the cells could be assembled to form organs or other parts of the life system. Note that a minimum amount of biological intelligence contained in the stem cell is essential for this purpose; psychical intelligence alone is not enough to produce results.
 - c. Biological structures produced internally from stem cells. Such structures are produced *in vivo* by employing stem cells. The structures developed inside a body for the purpose of regeneration or repair has the input of the biological intelligence of the soul in addition to the psychical intelligence of the scientists employed in the process. By this process, stem

cells can be used to develop tissues, organs and other parts of body systems *in vivo*.

- d. Cloning. Clones of a particular species have been produced using several techniques. In this process, the cells of the chosen species are placed in a womb (or similar environment) for further development, after necessary modifications. According to Jain philosophy, a soul must enter the object cell to produce the required body structure using its biological intelligence. Note that the soul of the cloned organism is different from the soul of the parent organism, and therefore it will have a different psychical intelligence. It is obvious that as the two souls will have different sets of karma, it is not possible to produce clones with a psychical personality exactly similar to the donor soul.
3. *Biological structures produced naturally by biological intelligence alone.* These structures are the bodies of organisms produced naturally by the manifested biological intelligence of the soul without any input from psychical intelligence – as happens in all normal beings. We find that such natural structures are far superior to artificial structures produced by the application of the human mind. This indicates that the manifested biological intelligence must be of a very high order in comparison to the manifested psychical intelligence, as *matijnana* and *srutijnana* of soul, in respect to biological functions. The body structure is maintained in the living state because of the intelligence of the soul. When death occurs the soul leaves the body, which is then without intelligence. In the absence of intelligence, the structure disintegrates and the body decomposes.

5.7 Conclusions

An interactive model of the empirical soul has been presented in this chapter. The *bhava* karma of the soul is linked to *dravya* karma of the *karman* body by the principle of parallelism. *Dravya* karma is linked to the gross body through radiations, *adhyavasaya* and *lesya*. The three units behave as a system. The concept of faculty has been presented to clarify the process of interaction between the soul and *dravya* karma, and

the manifested intelligence of the soul. The intelligence of the soul is reflected in the *dravya* karma through temporal changes in the karma states. The faculty of the soul in its worldly existence has been defined as an intelligent physical force expressed through karma radiations. Eight faculties, four psychical and four biological, have been defined based on the eight types of karma. The biological faculties, unaffected by the mind, work on an involuntary basis to regulate the biological processes of an organism. Examples of intelligent biological processes discovered by scientists have been described in brief and these have been shown to be guided by the manifested intelligence of the soul through the biological faculties. The manifested intelligence of the soul thus regulates the biological activity carried out by the genes. Thus the soul and matter together manage and operate the organic system of life. The soul responds intelligently to artificial changes in the body.

Biological structures have been classified based on how the soul's intelligence is used, and it is shown that there are many possibilities for the production of artificial biological structures by employing the human mind. All such structures are essentially a product of human intelligence. The claims that modern science has advanced new understandings of nature and the biological processes of organisms must be seen as an outcome of the application of human psychical faculties, which represent only a small fraction of the total potential intelligence of the soul. The full potential is realized in the omniscient state and it is not difficult to imagine that the Omniscient possesses infinite knowledge.

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6

Intelligent Design and the Evolution of Life

6.1 Creationism and Intelligent Design

The existence of life has always been a question for humanity. Hinduism, Christianity, Islam, Judaism, etc. believe in creationism, which holds that matter, the various forms of life, and the world were created by God out of nothing. There are different versions of creationism, including Dualistic and Non-Dualistic concepts of Hinduism, Young Earth Creationism, Gap Creationism and Progressive Creationism. “Creationism became the object of renewed interest among conservative religious groups following the wide dissemination of the theory of biological evolution, first systematically propounded by Charles Darwin in the 19th century. In the late 20th century, many creationists advocated a view known as Intelligent Design, which was essentially a scientifically-modern version of the argument from design point of view for the existence of God.” “This view is intended to demonstrate that living organisms were created in more or less their present form by an “Intelligent designer,” i.e. God. Proponents of intelligent design observed that the functional parts and systems of living organisms are incredibly complex, in the sense that none of their component parts can be removed without causing the whole system to cease functioning. From this premise they inferred that no such system could have come about through the gradual alteration of functioning precursor systems by means of random mutation and natural selection, as proposed by the standard account of evolution. Critics of Intelligent Design argued that it rests on a

fundamental misunderstanding of natural selection, that it ignores the existence of precursor systems in the evolutionary history of numerous organisms, and that it is ultimately untestable and therefore not scientific.

Creationist views reject scientific findings and methods. On the other hand, no scientific evidence supports Creationist viewpoints. Evolutionists find “overwhelming evidence that evolution has taken place and is continuing to occur. The annual changes in influenza viruses and the emergence of bacteria resistant to antibiotics are both products of evolutionary forces. Another example of ongoing evolution is the appearance of mosquito resistant to various insecticides, which has contributed to a resurgence of malaria in Africa and elsewhere.”

The International Society for Science and Religion believes that “intelligent design is neither sound science nor good theology. Although the boundaries of science are open to change, allowing supernatural explanations to count as science undercuts the very purpose of science: explaining the working of nature without recourse to religious language. Attributing complexity to the interruption of natural law by a divine designer is, as some critics have claimed, a science stopper. In the opinion of the overwhelming majority of research biologists, there are no examples of "irreducible complexity" in biological evolution that cannot be explained by normal, scientifically understood processes. Further, what may appear to be "irreducibly complex" today may be explained naturalistically tomorrow”.

6.2 Jainism’s view of Life

Jainism presents a view of life and the cosmos that does not involve any intervention of a supernatural power like God. It explains the phenomena of both the living and non-living worlds by propounding the existence of real substances that are independent and distinct. All real substances are eternal, powerful in their own right, and cannot be destroyed by one another. The real are not absolutely permanent, but rather transitory-permanent, i.e. real substances undergo transformation according to a set of rules while maintaining their essential characteristics. The transformation of these substances is based on the principle of causality, an approach that is also the foundation of modern science.

Jainism rejects all forms of creationism but accepts the theory of Intelligent Design in a different form: for Jainism, the "intelligent designer" is the soul, not God. The soul, under the influence of karma, is the power behind the designs of various bodies and species. The complexity of form increases from the lowest level of existence, one-sense beings, to the highest level of existence, five-sense beings that are endowed with mind.

Jainism believes in a finite *loka*, or cosmos, which is eternal. The *loka* contains six kinds of substances which are eternal, as is the *loka*: no supernatural power has created the *loka*, and creation of any kind is in fact not possible. Jainism divides the cosmos into three parts; the upper *loka*, middle *loka* and lower *loka*. We live in the middle *loka*, which contains a series of innumerable circumscribing islands. As the substances are transitory-permanent, the *loka* is also transitory-permanent, meaning that the islands experience changes in structure. The island or its part can be destroyed and created in a new form, keeping the total matter content of *loka* unchanged. Although this kind of process is not clearly mentioned in the scriptures, it is implied from the properties of matter. Jainism therefore allows for the destruction and formation of stars, island components and, in principle, has no objection to accepting that planets are formed when a new star is born. Modern science estimates the Earth is about 4.6 billion years old. While Jainism makes no mention of such a time frame, life must begin on a new planet and Jainism offers no opposition to such a concept. We shall study more about *loka* in Chapter 13.

6.3 Beginning of Life

How does life begin on a new planet? Modern science has not yet found a generally accepted answer to this crucial problem. Jainism offers an explanation. According to Jainism, a class of microorganism (*nigoda*) assumed to be much smaller than viruses is present all over the *loka*. The three bodies, gross, *karman* and fiery, of these sub-microorganisms are supposed to be made of the same subtle matter. Being a subtle body, this must be a non-genetic structure. These sub-microorganisms do not need oxygen to live and are present on the new planet. Their *karman* body

contains the plans for constructing a gross body provided the availability of suitable material and appropriate conditions for development. The gross body is formed spontaneously by the asexual process of agglutination (*sammurchhana*). It is possible that the success rate of this process is low and a body is produced only after several attempts.

Jainism describes in detail the nature of the code in the form of karma contained in the *karman* body, which has all the instructions to construct a body of a particular species. Modern science tells us that a DNA structure made of nucleotides is essential to produce a cell. It is also known that nucleotides can be produced naturally under favourable conditions, but that larger structures like DNA are not produced in this manner. The nucleotides provide suitable material for the sub-microorganisms. Using their intelligence and the *karman* code, they can assemble this available matter to produce the required DNA structure. DNA is the brick from which the cell is produced, as per the plan contained in the karma body. It is obvious that the simplest form of DNA and therefore a preliminary life form was produced in the beginning. Viruses, bacteria and archea are expected to be first-level life forms. These organisms have only one sense, touch (through the skin), by which they interact with the external world. Thus life begins on a new planet like Earth when conditions and time are favorable for the intelligent creation of microorganisms by the agglutination process.

6.4 Development of the Soul and Biological Evolution

The powers of the soul provide the force for biological evolution. A soul in any life form enjoys some bonded karma. Going through several births, the soul reduces its karma load and increases its level of manifested intelligence. With an enhanced level of intelligence, the soul is in a position to take the form of a species with a higher biological complexity. The soul may take billions of years to get out of the stage of a microorganism. In the next phase of development the soul acquires a plant body, which also has one sense of touch. Plants produce oxygen and make the atmosphere suitable for higher forms of life.

In the first part of biological evolution, different species with one sense, touch, are progressively and spontaneously produced by the power

of the soul. After going through births in the form of various one-sense species, the soul intelligence is in a position to design the body of a higher organism with two senses, touch and taste, again spontaneously by the process of agglutination. Jainism describes that organisms with up to four senses (invertebrates) have spontaneous births by agglutination. It may be noted that worms, etc. are two-sense; ants, etc. are three-sense (touch, taste, smell); and mosquitoes, flies and other insects are four-sense (touch, taste, smell, sight) organisms. Marine creatures like fish, etc., all kinds of birds, terrestrial animals, and human beings are five-sense creatures (vertebrates) and are endowed with mind. Five-sense beings may take birth by both sexual and asexual methods (cloning is a method of asexual birth).

We have some idea how the intelligence of the soul is fundamental to the process of evolution. On the fruition of karma, the karma body continuously emits radiation, known as *adhyvasaya*, which interacts with the cells and body systems. The karmas transmit the intelligence of the soul through these *adhyvasaya* and provide the psycho-physical forces that operate the body system (as discussed in chapter 3). The radiation from rising biological karma is responsible for constructing, developing and maintaining the body, its disorders, malfunctioning and other kind of variations, producing pain and pleasure, general physical health, and lifespan. DNA contains a code and stores information. This is like the operating software. The karma body contains the plan and code for constructing the cells, tissues, organs, body parts and systems of the body of a given species in accordance with the karma bonded in the previous life. The karma body is seen to contain the application software, which in conjunction with the operating software of DNA produces the form of the body structure of a particular species. It is known that DNA is influenced by words and frequencies. The karma radiation must interact with the DNA to produce the structure suitable for the species dictated by the law of karma. It must be emphasized that DNA alone cannot accomplish evolution, as assumed by scientists. Both kinds of software are necessary for the formation of the body. A cell separated from the body retains the operating software and is able to divide, but in the absence of the application software it cannot construct a tissue or an

organ. If a replicating cell can be produced artificially, it would contain only the operating software: it cannot organize to form body parts until a soul containing intelligence and the application software enters it. It must be emphasized that the intelligence of the soul uses the DNA bricks to construct the body, as per the plan provided by karma.

Jainism accepts biological evolution, but links it to the process of the development of the soul. The power of the soul is the main force behind evolution; natural forces have a helping role. The karma scheme is general and covers a wide variation of shape, size, structural features, color, etc. of any species. Variation in the features of a species is admitted in Jainism on the basis of the manifestation of intelligence, depending on the working of environmental factors.

As the soul evolves from one-sense to five-sense animals and finally to a human being, the brain must also grow correspondingly to store larger amounts of information. This is verified by medical science when we examine the nervous system and brain structure of animals and human beings.

Plants do not have a nervous system and brain; hormones regulate all body functions. The hormones control chemical activity in the cells, including growth and flowering. All this is possible with a minimum amount of consciousness and intelligence. In the higher stages of evolution, the body has a nervous system. The simplest possible creature has an incredibly simple nervous system made up of nothing but reflex pathways. For example, flatworms, two-sense organisms, and invertebrates with up to four senses, do not have a centralized brain. They have a loose association of neurons arranged in simple reflex pathways. Flatworms have neural nets, or individual neurons linked together to form a net around the entire animal.

Most invertebrates (such as lobsters) have simple brains that consist of localized collections of neuronal cell bodies called ganglia. Each ganglia controls sensory and motor functions in its segment through reflex pathways, and the ganglia are linked together to form a simple neuron system. As the neuron system evolved, chains of ganglia evolved into more centralized brain. Brains of invertebrates evolved from ganglia.

As we proceed from fishes towards humans, the cortex gets bigger, takes up a larger portion of the total brain and becomes folded. The enlarged cortex takes on additional higher-order functions, such as information processing, speech, thought and memory. In addition, the part of the lower brain called the thalamus evolved to help relay information from the brainstem and spinal cord to the cerebral cortex. Primitive vertebrates such as fish, reptiles, and amphibians have fewer than six layers of neurons in the outer layer of their brains. More complex vertebrates such as mammals have a six-layered neo-cortex, in addition to having some parts of the brain that are allocortex. In mammals, increasing convolutions of the brain are characteristic of animals with more advanced brains. These convolutions provide a larger surface area for a greater number of neurons while keeping the volume of the brain compact enough to fit inside the skull.

The structure of the human brain differs from that of other animals in several important ways. These differences allow for many abilities over and above those of other animals, such as advanced cognitive skills. Human encephalization is especially pronounced in the neo-cortex, the most complex part of the cerebral cortex. The proportion of the prefrontal cortex is larger than in all other mammals (indeed larger than in all animals, although only in mammals has the neo-cortex evolved to fulfill this kind of function).

We see that the structure of the brain is related to the development of the soul. One-sense plants have no brain, worms have a neural net and invertebrates have ganglia. The brain is developed in five-sense animals, and its complexity increases from lower-order to higher-order animals. The human brain is the most complex. Thus as the soul develops with increasing intelligence, it possesses a form with an increasingly complex brain. A corollary of this is that a soul with low intelligence cannot possess a form with a complex brain, which is only suitable for a soul with higher intelligence. For instance, a soul with an ant's body cannot normally jump to a human body. A soul has to gradually develop as its intelligence increases. In other words, evolution is driven by intelligence

or the law of karma. Small microorganisms are at the bottom and humans are at the top of the ladder.

How many body forms or designs of species can the soul produce? The soul is the perfect designer and produces designs that give optimum performance in all respects for the given level of intelligence. At the minimum level of intelligence, bodies with only one sense (touch) are designed; as the level of intelligence increases, more senses are incorporated into the design. According to Jain philosophy, the soul produces a total of 8.4 million designs for species, *yoni*, with the simplest being the sub-microorganism (*nigoda*) and the highest the human being. Variations of each design are possible, and the total number of variants, known as *kula*, is 20.05 million. Each design is unique; it has an optimum configuration of features that are specific to that form. Each design has an irreducible complexity that increases from the lower to the higher organisms. Each body form and its design is a marvel of the highest order and exhibits features that are mind-boggling and beyond human comprehension.

The development of the soul does not stop with the end of biological evolution. Biological evolution is the first part of the development of the soul in which the soul acquires sense capabilities that are essential for further development, which is mainly spiritual. It is important to note that biological evolution and the development of the soul are apparently similar, but the concepts behind them are fundamentally different. Biological evolution is assumed to be based on the concept of natural selection, struggle and survival of the fittest, whereas the development of the soul is based on the concept of the eradication of karma, and benevolent acts of cooperation and mutual help and co-existence. These latter features are characteristic of all life forms. Self-defense, which may qualify as a struggle at the individual level, is a need for every living being, but when viewed at a collective level, organisms do help each other and form groups where mutual help and support may override personal convenience. This tendency of mutual help can be seen at all levels of existence. Microorganisms help with the digestion of food in the stomachs of all beings, trees provide food to all creatures, worms assist in agriculture, and ants form communities, bees

work for the queen to produce honey, and so on. The struggle for survival is not evident in creatures with up to four senses that do not have a mind. Five-sense beings, which have a mind, are also seen to love and help their offspring, form families and groups, and exhibit a sense of collective survival. All creatures have instincts and work for their fulfillment at an individual level, but they also have a sense of mutual need that limits their individual liberty.

Every organism wants to live; no one wants to die. So there is a natural tendency in organisms to develop features that help in survival. Survival is affected by environmental conditions and the population of other life forms of that region, and to that extent organisms tend to acquire suitable morphological changes through mutation and other biological processes. This is a force to reckon with in biological evolution, but does not constitute the sole reason for change; the intrinsic power of the soul to develop is the main force behind evolution.

The question may be raised as to how the very first member of a higher species, particularly human beings, evolved. It is very likely that births were asexual initially. Jain scriptures mention that in early history humans were born in pairs, male and female, and at the end of their life they gave birth to another pair and so on. These human beings were dependent on trees for all of their requirements and did not have any skills. When the food supplies from forests fell short of demand, agriculture was invented by the first Tirthankara, Rishabhdeva, who as a king also taught other kinds of skills like writing, trading, accounting, defending (fighting) and crafting.

6.5 Evolution in the Cosmos

Scientists have been searching for extraterrestrial life, with little success so far. However, they anticipate the existence of many Earth-like planets in the universe where life must exist. The Jain scriptures state that life is flourishing all over the *loka*, but that animals and humans are found only in the middle *loka*. Out of the innumerable islands (cosmological structures) in the middle *loka*, human beings are found on 2½ islands and animals on all of the islands. Human beings are of

different kinds; physiologically they are of two types, one like us and the other with animal faces.

Let us analyze the question of the existence of life from the point of view of the evolution process. The process of evolution depends on a large number of factors and is highly uncertain and probabilistic. When evolution takes place on a large number of planets, the diversity of the local conditions, the path evolution takes and the dynamic state of the soul would determine to what stage evolution is able to proceed on each planet. Jains believe that on all but the 2½ islands where humans are found evolution proceeds to the stage of five-sense animals only. Variation is found in the size and shape of animals from planet to planet; for example, the farthest island, Swayambhuraman, has the largest fish. In the 2½ islands, human beings are found to vary in shape and size. Human beings of our type are found in only 3 regions of our Island, and 15 regions of the 2½ Islands; other regions have human beings with animal faces or some other combination of common human beings and animals. Such human beings are not expected to have speech or language abilities like ours and obviously must lack communication skills. Jain scriptures state that these human beings do not possess the six kinds of skills which we have and lead a forest-based life (*Bhoga Bhumi*). Does a civilization more advanced than ours exist elsewhere? In the spiritual sense, the answer is yes. We live in the Bharat Ksestra region of our Island. In the Videha region, at the centre of this Island, human civilization is said to be more spiritually advanced, and also, perhaps, more intelligent. They remain happy all the time, whereas the human beings in our region are said to have repeating cycles of happiness and unhappiness over a period of hundreds of thousands of years.

6.6 Higher Evolution

Sensual evolution up to the stage of a human being is in fact the lower kind of evolution, in which the soul starts its journey from the sub-microorganism stage and reaches a state with a five-sense body and mind. Further evolution is spiritual in nature, in which the soul attains the ultimate goal of perfection and purity. The journey begins with the

realization that the body is different from the soul and that the body is the source of all miseries and sufferings. On such realization, the soul undergoes a sea change in its outlook. The external world loses attraction; it directs its mind and energy to the purification of the soul by removing the karmic load through the practice of austerities, penance and meditation. Jainism has dealt in detail with the rules and methods for this spiritual journey, which ends up with the state of omniscience in the embodied form. In the last stage, the soul is emancipated, discards the body, and lives in a pure and perfect state forever, realizing infinite bliss, intelligence, awareness and energy. This higher evolution has not yet become the subject of scientific investigation.

The Human Body is a Rare Opportunity

There are three types of births: sexual, asexual (*sammurchhana*) and spontaneous (*upapada*). The latter type, spontaneous, is applicable to beings in heaven and hell. Animals with less than five senses are supposed to have an asexual birth. Five-sense animals and humans have a sexual birth. For sexual birth it is necessary that: (1) the male and female partners engage in sexual activity (or artificial insemination is performed); (2) their sperm and ovum are fertile and meet in a proper way to fuse together; and (3) there is no miscarriage or forced abortion. The soul enters the fertilized cell for further growth and development into its full form. Besides these physical conditions, the soul taking birth must be eligible for that type of birth; that is, it must bond the *naama* Karma required for that particular birth.

The souls eligible for human birth come from four sources: existing humans, animals, and souls from the heavens and hells after they complete their life there. Consider a case where the eligible number of souls for human birth is large and the opportunities available for birth are few, due to the physical limitations cited above. This means that a large number of souls are competing for limited chances and obviously only a few succeed in their attempts. This makes the probability of human birth very low. What happens to souls that are eligible and fail to get a chance on this planet? They may be born as human beings elsewhere in the *loka*, or as *sammurchhana* human beings and live a short life unworthy of

notice. Animal species with asexual birth and beings in heaven and hell do not suffer from birthplace limitations, and any number of eligible souls can be born in that form. This explains why the human population is the smallest minority out of all living forms in the *loka*. Human birth on karma *bhoomi* is essential for the soul to attain emancipation, but it is a rare opportunity.

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7

Emotions and *Bhava* in Jainism and Western Thought

7.1 Introduction

No aspect of our mental life is more important to the quality and meaning of our (embodied) existence than our emotions. Emotion is a mental activity followed by its physical expressions and actions. Western thinkers have identified emotions as a complex psycho-physiological experience influenced by the biochemical activity of the body and the environment. In Jainism, *bhava* is a mode of the soul that is determined by the rise, suppression, annihilation, and annihilation-cum-subsidence of psychical karma, accompanied by activity in the body in the form of physical expressions and actions. Emotion is an aspect or component of

bhava. In Western models, the stimuli for emotions come from either the body or the environment; in Jainism, these are auxiliary causes for changes in the state of the soul, and the main cause of emotions is a transformation in the state of the soul due to activity in the karma body. Despite this difference, both approaches maintain that emotions/*bhava* involves both mental activity and physical changes in the body. In this chapter, I compare the Jain and Western ways of understanding emotions.

7.2 Emotions in Western Thought

“Emotions are a complex psycho-physiological experience of an individual’s state of mind as it interacts with biochemical (internal) and environmental (external) influences [1].” “Emotions provide the affective component for positive or negative motivations; motivations direct and energize behavior.” Although the word emotion might seem to concern feeling rather than thinking, cognition – particularly the interpretation of the meaning of events – is an important aspect of emotions. “Thoughts” can refer either to the act of thinking or to the resulting ideas or arrangement of ideas. The activities of interpreting, evaluating, imagining, planning, and remembering are also modes of thought.

Some thinkers advocate an integrated approach to thinking that combines the mind and body [2]. “The Embodied Cognition approach states that the classical method of separating the mind from the body to analyze its processes is misguided: instead, we should see that the mind, actions of an embodied agent, and the environment it perceives and envisions, are all parts of one whole which determine each other. A functional analysis of the mind will always leave us with this mind-body problem, which cannot be solved.”

Emotions have been classified into different categories. In 1972, Paul Ekman classified the basic emotions as anger, disgust, fear, happiness, sadness and surprise [3]. Robert Plutchik “developed the “wheel of emotions,” suggesting that there are eight primary bipolar emotions: joy versus sadness; anger versus fear; trust versus disgust; and surprise versus anticipation [4].” “Some basic emotions can be combined to form complex emotions. Similar to the way primary colours combine,

primary emotions could also blend to form the full spectrum of human emotional experience.”

“Emotion is one type of affect; other types are mood, temperament and sensation. An emotion is a response to a specific stimulus, which can be internal, like a belief or a memory. It is also generally agreed that emotions have intentional content, which is to say that they are about something –often the stimulus itself. Moods, on the other hand, are typically not about anything, and (at least some of the time) does not appear to be caused by a specific stimulus. Emotions also have a relatively brief duration – of the order of seconds or minutes – whereas moods last much longer.”

“Passion” is related to “emotion.” “Passion is a very strong feeling about a person or thing. It is an intense emotion, compelling rise of feeling, enthusiasm, or desire for something. Passion and desire go hand-in-hand, especially as a motivation.” Passion and desire are inseparable. Both can be either creative or destructive – and their dark side can be dangerous to the self or others.

7.2.1 Theories of Emotions

The principal theories proposed for emotions are:

1. Somatic Theories

Somatic theories of emotions claim that bodily responses, rather than judgments, are essential to emotions. In James-Lange’s theory, emotions are feelings caused by changes in physiological conditions relating to the autonomous and motor functions [5]. “We feel sorry because we cry, angry because we strike, afraid because we tremble, and (it is) not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be.” “By assimilating emotions into the category of sensations, these theories fail to take account of the fact that emotions are typically directed at intentional objects.” These theories are less favoured now.

2. Cognitive Theories

Cognitive theories argue that cognitive activity – in the form of judgment, evaluation, or thought –is necessary for an emotion to occur. “This cognitive activity may be conscious or unconscious and may or

may not take the form of conceptual processing. Emotion is a disturbance that occurs in the following order [6, 1]:

- (1) Cognitive appraisal: the individual assesses the event cognitively, which cues the emotion.
- (2) Physiological changes: the cognitive reaction starts biological changes such as increased heart rate or pituitary adrenal response.
- (3) Action: the individual feels the emotion and chooses how to react.”

“A neurobiological approach distinguishes two classes of emotions:

- (1) Classical emotions including love, anger and fear, are evoked by the appraisal of scenarios as fed by environmental stimuli via distance receptors in the eye, nose and ears.
- (2) Homeostatic or primordial emotions are feelings such as pain, hunger, thirst, and fatigue, evoked by internal body states and communicated to the central nervous system by interoceptors, which motivate behavior aimed at maintaining the body’s internal milieu at its ideal state.”

“Two observations demonstrate some of the motivation for the cognitive position: different individuals will respond to the same event with different emotions; and the same individual may at different times respond differently to the same stimulus.”

3. Non-Cognitive Theories

“Non-cognitive theories are those that defend the claim that judgments or appraisals are not part of the emotion process [6]. The non-cognitive position holds that an emotional response directly follows the perception of a relevant stimulus. Thus, the early part of the emotion process is thought to be reflex-like, rather than involving any sort of evaluation or judgment about the stimulus.” There are two different non-cognitive approaches. The first claims that only some emotions are non-cognitive; the second considers all emotions to be non-cognitive.

7.2.2 The Ontology of Emotions

What, in the end, are emotions [5]? What do they ultimately consist of? Are they physiological processes, or neuro-physiological states, or adaptive dispositions, or evaluative judgments, or computational states, or even social facts or dynamic processes? “Scherer viewed emotions as a genus of processes typically involving five different component aspects, comprising subjective feelings, cognition, motor expression, action tendencies or desire, and neurological processes [7].”

“Ronald de Sousa on the other hand argued that emotions are not reducible to beliefs, desires, or a combination of the two, but represent a logically and functionally separate category of capacities.” Aaron Ben-Ze’ev advocates that “emotions form a distinct mode of feelings or psychological system [8]. They are prototypical concepts rather than names of natural kinds of modes, and their subtlety derives from the fact that the emotional mode constitutes an exercise of all of the faculties, particularly in response to change, at the level of perception, intellectual processes, and feelings.”

7.3 Bhava, Emotions and Passions in Jainism

Bhava and emotions have different meanings in Jainism. *Bhava* is said to be a disposition of the subtle level of consciousness of the soul. *Bhava* is the subtle vibrations of the soul that arise due to the changes in karma on its rise (*udaya*), fruition (*vipaka*), subsidence (*upashama*), annihilation (*ksaya*) and annihilation-cum-subsidence (*ksayopashama*) [9]. Emotions are caused by the rise of quasi-passions (*nokashaya*), part of conduct-deluding (*charitra-mohaniya*) karma. Thus the emotions are just one aspect of *bhava*, or the attitude (disposition) of the soul, in Jainism.

The main karma responsible for *kashaya* and *nokashaya* is conduct-deluding karma. In Chapter 3, I introduced deluding karma’s two subtypes, (a) belief (or perception)-deluding (*darshana-mohaniya*) karma and (b) conduct-deluding (*charitra-mohaniya*) karma. Belief-deluding karma (*darshana-mohaniya*) has three subtypes: wrong belief (or non-belief)-deluding karma (*mithyatva*), mixed belief-deluding karma (*samyagmithyatva-misra*), and right belief-deluding karma (*samayak prakriti mithyatva*). Conduct-deluding karma (*charitra-mohaniya*) has two subtypes:

1. *Kashaya* karma. *Kashaya* is translated as “passions”: anger, ego, deceit and greed. Each passion can be present in four grades: *anantanubandhi*, *apratyakhyanavarana*, *pratyakhyanavarana*, and *samjvalana* (flaming up). Thus, there are 16 subtypes of passion karma.
2. *Nokashaya* karma. *Nokashaya* is translated as “emotions:” laughter (including joking, sarcasm, ridicule, criticism, humor, satire, etc.); indulgence (or love, happiness); dissatisfaction (or hate, sadness); sorrow; fear; disgust; male disposition; female disposition; and hermaphrodite disposition (the last three indicate sexual desires). The soul experiencing these emotions is hindered in the practice of right conduct.

We must understand the difference between passions, *kashaya*, and emotions, *nokashaya*. Passions and emotions belong to the same family of conduct-deluding karma and are similar in character, except that passions are higher-order experiences than emotions. Both passions and emotions cause bondage. Emotions excite the karma (field), and therefore the soul; passions provide the force for the bonding of karma. In fact, emotions are multiplying factors: they cause the effects of the passions to multiply and participate in the bonding process. In the absence of emotions, the passions are not as powerful.

On the basis of the above, we can classify emotions into seven basic categories: joking (laughter); liking (love, happiness); disliking (hate, sadness); sorrow; fear; disgust; and sexual desire. The passions are four (anger, ego/pride, deceit and greed), each occurring in four grades to give a total of 16 subtypes. The passions can take place with or without emotions. The intensity of the passions when mixed with emotions is greater than the intensity of the passions without emotions. These karmas are the principal cause for the embodiment of the soul and are the main determinants of the mode of the soul. The whole emphasis in Jain philosophy is on their elimination. Emotions and passions are not a natural property of the soul; they are generated by karma. The natural property of the soul is equanimity; the inculcation of this property provides the means to eliminate passions and emotions. An individual

practicing equanimity does not allow passions and emotions to affect him or her, and thus prevents the influx of new karma.

Our knowledge, perception, vitality, thoughts, feelings, and emotions represent the attitude or disposition (*bhava*) of the soul at any instant [10]. The disposition (*bhava*) of the soul is determined by rising karma. There are three ways in which karma creates an effect: (i) fruition or rise of karma, in which the karma becomes active after completing the passive period; (ii) subsidence of karma, in which the karma is suppressed temporarily by willpower and made ineffective; and (iii) annihilation of karma, in which the karma is eliminated completely by powerful actions. Based on this, there are five kinds of dispositions or active modes of the soul's manifestation:

1. Disposition (*bhava*) of the soul by the rise of karma (*audayika bhava*)
2. Disposition (*bhava*) of the soul by the subsidence of karma (*aupashamika bhava*)
3. Disposition (*bhava*) of the soul by the annihilation of karma (*ksayika bhava*)
4. Disposition (*bhava*) of the soul by the partial subsidence and partial annihilation of karma (*ksayopshamika bhava*)
5. Disposition (*bhava*) of the soul by its natural disposition (*parinamika bhava*).

There are some faculties of the soul that do not yield to karmic forces. These faculties are responsible for the generation of its natural disposition. The manifestations that depend upon the soul alone are natural. They are independent of the operation, destruction, subsidence and the destruction-subsidence of the karmas. Actually speaking, these manifestations are the expression of the modes that result from different attributes of the soul. The modes themselves are not identified with them; in fact, the subdivisions of these natural manifestations suggest that they represent the generality of a number of the soul's attributes.

According to Jain philosophy, in the life of a *jiva* the karma *pudgala* are sometimes active while other times they are dormant. The active stage reflects the "*audayika*" personality whereas the dormant

personality is known as “*ksayopashamika*.” In the *audayika* personality, the karma is in the state of rising; in the *ksayopashamika* personality, it is in the state of annihilation-cum-subsidence.

There are seven characteristics of the *audayika* personality:

1. Lack of capacity to know and perceive
2. Infatuation due to the impulses of anger, fear and libido
3. Experience of powerlessness
4. Experience of pain or pleasure
5. Experience of high or low status
6. Experience of auspicious and inauspicious things
7. Experience of life and death

There are four characteristics of the *ksayopashamika* personality:

1. Capacity to know and see things
2. *Amurchha* (freedom from infatuation), *Abhaya* (fearlessness) and *Ananda* (bliss)
3. Experience of powerfulness
4. Freedom from experiencing pleasure and pain

The symptoms of *audayika* and *ksayopashamika* personalities are exactly opposite of each other. When the *jiva* settles into the state of *chaitanya*, i.e. pure consciousness, its dual personality fades out and it attains a truly “*ksayika*” (emancipated) personality due to the total annihilation of all psychical karma.

The fruition of karma decides the realm of existence in which the soul will be born, its gender, and its attitudes like anger, ego, deceit, greed, wrong belief, wrong knowledge, and non-restraint. The suppression of karma develops attitudes of true faith and true conduct. The annihilation of karma develops true faith, true conduct, right perception, right knowledge, vitality, etc. Partial suppression and partial annihilation of karma develops: true faith; true conduct; the perceptions of vision, non vision and clairvoyance; empirical, scriptural and clairvoyant knowledge of right or wrong; mind reading; vitality; partial restraint; and so on. The general body of karma determines the state of the individual soul.

In the following analysis it is assumed that passions and emotions are closely linked and that together they determine the state of the perverted soul. It is their combination that is important in the study of emotions. In the spiritual ascent of the soul, the emotions are eliminated first; some passions exist until the very last stage of spiritual development.

The seven basic emotions, 16 passions, and three beliefs can combine to give a range of emotional states. These states are determined by the rise/fruition of karma. The possible combinations of the rise/fruition of deluding karma have been described as follows [11]:

- 1) Souls practicing *mahavrata* (ascetics). These souls have attained *samyaktva* and have only flaming up passions (F). The following emotions are possible:
 - a. F anger (or pride, deceitfulness, greed). No emotion is on rise. [4]
 - b. F anger (or pride, deceitfulness, greed) + sex emotion. Here any passion combines with the sex emotion. [4]
 - c. F anger (or pride, deceitfulness, greed) + sex emotion + joking and liking (or disliking and sorrow). Here it is assumed that some emotions occur in pairs, e.g. joking and liking, and disliking and sorrow. [12]

Example F anger plus sex

- i. F anger plus sex, joking and liking
- ii. F anger plus sex, disliking and sorrow
- d. F anger (or pride, deceitfulness, greed) + sex emotion + joking and liking (or disliking and sorrow) + fear (or disgust or *samyaktva*) [24]

Example F anger plus sex, fear

- i. F anger plus sex, joking and liking, fear
- ii. F anger plus sex, disliking and sorrow, fear
- iii. F anger plus sex, disgust
- iv. F anger plus sex, joking and liking, disgust

- v. F anger plus sex, disliking and sorrow, disgust
- e. F anger (or pride, deceitfulness, greed) + sex emotion + joking and liking (or disliking and sorrow) + fear + disgust (or fear + *samyaktva* or disgust + *samyaktva*) [12]

Example F anger plus sex, fear, disgust

- i. F anger plus sex, joking and liking, fear, disgust
 - ii. F anger plus sex, disliking and sorrow, fear, disgust
- 2) Souls practicing *anuvratas*. In this case the *anantanubandhi* and *apratyakhyanavarana* passions have been eliminated. The other two types of passions, *pratyakhyanavarana* and flaming up, rise simultaneously. Or, we can assume that the flaming up passions have a comparatively negligible effect on the soul in the presence of *pratyakhyanavarana* (P) passions.

The following combinations are possible in this case:

- a. P anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) [12]

Example p anger plus sex

- i. P anger plus sex, joking and liking
- ii. P anger plus sex, disliking and sorrow
- b. P anger (or pride, deceitfulness, greed) + sex + joking and liking (or disliking and sorrow + fear (disgust or *samyaktva*) [24]

Example p anger plus sex, fear

- i. P anger plus sex, joking, liking, fear
- ii. P anger plus sex, disliking and sorrow, fear
- iii. p anger plus sex, disgust
- iv. P anger plus sex, joking and liking, disgust
- v. P anger plus, sex, disliking and sorrow, disgust

- 3) Soul has *samyaktva* but is not practicing *anuvratas*. In this case the *anantanubandhi* passions have been eliminated. The other three subtypes of the passions rise simultaneously, but for all practical purposes the *apratyakhyanavarana* (A) passions are dominant.

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- a. A anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) [12]

Example A anger plus sex

- i. A anger plus sex, joking and liking
ii. A anger plus sex, disliking and sorrow
b. A anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear + disgust + *samyaktva*
c. A anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear (or disgust or *samyaktva*) [24]

Example A anger plus sex, fear

- i. A anger plus sex, joking and liking, fear
ii. A anger plus sex, disliking and sorrow, fear
iii. A anger plus sex, disgust
iv. A anger plus sex, joking and liking, disgust
v. A anger plus, sex, disliking and sorrow, disgust
d. A anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear + disgust (or fear + *samyaktva* or disgust + *samyaktva*) [12]

Example A anger plus sex, fear, disgust

- i. A anger plus sex, joking and liking, fear, disgust
ii. A anger plus sex, disliking and sorrow, fear, disgust
4) The soul has eliminated the *anantanubandhi* passions but has still not attained *samyaktva*.
a) A anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + mixed belief
b) A anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + non-belief (*mithyatva*)
5) The soul is in the *mithyatva* (non-belief) state and the *anantanubandhi* (Ann) passions are present and dominate the emotional state of the soul.

- a. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) [12]

Example Ann anger plus sex

- i. Ann anger plus sex, joking and liking
ii. Ann anger plus, sex, disliking and sorrow
b. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear + disgust + *samyakprakriti*
c. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear + disgust + mixed belief
d. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) +fear +disgust (*samyakprakriti*). This is the case when the soul in *mithyatva* state temporarily attains *samyakprakriti*. [12]

Example A anger plus sex, fear, disgust

- i. A anger plus sex, joking and liking, fear, disgust
ii. A anger plus sex, disliking and sorrow, fear, disgust
e. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear (disgust) + non-belief
f. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + non-belief
g. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear (disgust) [24]

Example Ann anger plus sex, fear

- i. Ann anger plus sex, joking and liking, fear
ii. Ann anger plus sex, disliking and sorrow, fear
iii. Ann anger plus sex, disgust
iv. Ann anger plus sex, joking and liking, disgust
v. Ann anger plus, sex, disliking and sorrow, disgust

- h. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear + disgust + mixed belief
- i. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear + disgust + *samyakprakriti*
- j. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear + disgust + non-belief
- k. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear + disgust [12]

Example Ann anger plus sex, fear, disgust

- i. Ann anger plus sex, joking and liking, fear, disgust
- ii. Ann anger plus sex, disliking and sorrow, fear, disgust
- l. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear (disgust) + non-belief
- m. Ann anger (or pride, deceitfulness, greed) + sex +joking and liking (or disliking and sorrow) + fear + disgust + non-belief

The above combinations include both belief-deluding and conduct-deluding karma subtypes. Belief-deluding karma is known to participate in the cognition activity of the soul, [12] and so is a part of the perception and knowledge process, as explained in Chapter 4. This implies that the rise of this karma describes the *bhava* rather than the emotional states. It is, therefore, presumed that the combinations with only subtypes of conduct-deluding karma describe the states of passions and emotions. It is further presumed that the combination of *kashaya* (passions) and *nokashaya* (emotions) also constitute emotions. This means that the emotions are mixed with passions, which appears to be true in practice. Based on these assumptions, the number of emotions calculated in each case is written in parenthesis at the end of each combination. In this calculation, sex has been considered one emotion. Adding up the emotions we get:

Number of emotions (mixed type) = 200

Adding the 7 basic emotions, the total number of emotions is 207. We do not have names for all of these, but this demonstrates the wide spectrum of possible emotions.

The emotions, passions and *bhava* appear to operate differently in the system. The rising deluding karma emits radiations that interact with the *tejas* body to produce *lesya* waves. *Lesya* waves interact with the endocrine glands that secrete hormones, which control the chemical activity in the body. Hormone secretion has been found to be associated with emotions and passions. As emotions and passions are produced by rising deluding karma, they are not supposed to have cognitive components – which would require the operation of intelligence-obscuring and awareness-obscuring karma. Therefore, emotions and passions appear to describe the non-cognitive states of the soul. *Bhava*, on the other hand, takes into account all of the psychological karmas – indicating that the mind is involved in this process. Therefore *bhava* is assumed to describe the cognitive states of the soul. Comparing this scenario with Western approaches we find that:

1. In Jainism, emotions and *bhava* are not properties of the soul; rather, they are karma-generated experiences. There is no such concept in Western thought.
2. Jainism distinguishes between *bhava* and emotions. *Bhava* is the overall cognitive state of the soul, produced by the rise of different karmas. Emotion is the non-cognitive state of the soul produced mainly by the rise of conduct-deluding karma and constitutes just one aspect or subset of *bhava*.
3. Emotions are systematically classified in Jainism. Jains and Western thinkers differ in defining some emotions. Anger is a passion in Jainism and an emotion in Western philosophy. Also, sexual desire is an emotion in Jainism and a passion in Western thought.

The diversity of views on cognitive and non-cognitive emotions in Western thought results from the grouping of emotions and *bhava* into one category. For instance, Ben-Ze'ev appears to refer to *bhava*, not

emotions. Scherer also appears to refer to *bhava* in his proposition referred to above.

7.4 Bhavana

Bhavana is another technical term in Jainism. Ganadhipati Tulsi and Acharya Mahaprajna, in their *Dictionary of Technical Terms of Jainism*, have listed the following meanings of *bhavana*:

1. Repeated contemplation on the idea of making oneself resemble one's ideal (goal) - The process of infusing one's *Citta* (psyche) (with such idea) through strong resolve.
2. The practice of detachment etc. undertaken for the purification of the *Citta* (psyche), cessation of delusion and cultivation of noble virtues and character building.
3. To infuse the *Citta* (psyche) to make it favourable to the practice of meditation in order to undertake such practice.
4. The superlative practices (like contemplation) to make the observance of *Mahavrata*s (great vows) more meticulous.

Bhavana therefore describes desire and an attempt to purify the soul, to make it free from *bhava*. *Bhavana* here has been taken in a positive sense, but negative *bhavana* (increasing the karma load on the soul) is also possible. *Bhavana*, like emotions, has a wide spectrum. *Bhavana* is goal-oriented and aimed toward a purpose in life; it has intentional content. *Bhavana* is the inculcation of *samskaras* that purify the psyche, remove perverseness and strengthen and stabilize the vows of non-violence, truth, non-stealing, celibacy and non-possession. Depending on the intention, *bhavana* can be good or bad. *Bhavanas* can be learned and inculcated; *bhava* is the product of rising karma. For instance, one learns to do social service, which may then become one's *bhavana* and purpose in life. *Bhavana-yoga* is a powerful method in the Jain system for uniting the mind with the soul.

Twelve benevolent *bhavana* that help the practitioner to progress on the path of purification of the soul are described in Jainism [13]. These are the consideration of: the transitory nature of all things; the helplessness of human being; the *samsara*; the isolation of the soul; the

heterogeneity of soul and body; the impurity of the body; the influx of karma; the impeding and destruction of karma; the world; the scarcity of enlightenment; and the truth proclaimed by religion. Besides these, four other *bhavanas* are also described:

1. Friendship (*Maitri*). Enmity produces fear and mental tension. A feeling of friendship produces happiness and fearlessness. One must think good of all to strengthen the feeling of friendship.
2. Absence of jealousy (*Pramoda*). The feeling that every soul has equal potential removes the feelings of jealousy and unhappiness. Such individuals accept the potential in everyone and do not become jealous of their achievements.
3. Kindness (*Karuna*). Enmity takes a person away from the truth. Feelings of kindness show the earnestness of an individual for the truth.
4. Non-favoritism (*Madhyasthata*). Favoritism promotes inequality in society and produces unhappiness.

Bhava lasts longer than emotions; the duration can be hours or days. *Bhavanas* are relatively steady and can last for months or even years, since they are connected to some purpose in life. Emotions are like a disturbance on the surface of a lake that arises and subsides quickly. *Bhava* is like a deeper layer where only strong disturbances, the passions, can make their effect felt. *Bhavanas* are like the deep mass of water that is hardly affected by surface disturbances; changes there take place only by interaction with the environment.

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8

Philosophy of Mind

8.1 Conscious Mental States in Western Thought

Explaining the nature of consciousness is one of the most important

and perplexing areas of Western philosophy. “Perhaps the most commonly used contemporary notion of a conscious mental state is captured by Nagel’s famous experience statement “what it is like”. When you are in a conscious mental state, there is something that it is like for you to be in that state, from the subjective or first person point of view. But how do you understand this? For instance, how is the conscious mental state related to the body? Can consciousness be explained in terms of brain activity? What makes a mental state conscious? The problem of consciousness is arguably the most central issue in the current philosophy of mind and, importantly, is also related to major traditional topics in metaphysics, such as immortality and free will.”

“Some philosophers attempt to explain consciousness directly through neurophysiological or physical terms. Others offer cognitive theories of consciousness, in which conscious mental states are reduced to some kind of representational relationship between mental states and the world. There are a number of such representational theories of consciousness, including higher order theories which hold that a mental state is conscious if the subject is aware of it in some sense. The relationship between consciousness and science is also central to much current theorizing on this topic. How does the brain “bind together” various sensory inputs to produce a unified subjective experience? What are the neural correlates of consciousness? What can be learned from abnormal psychology that might help to understand normal consciousness? To what extent are animal minds different from human minds? Could an appropriately programmed machine be conscious?”

An intuitive way to talk about consciousness is to say that a mental state is conscious when you are conscious of it. From this, it might seem that the term “conscious” is synonymous with “awareness,” “experience,” or “attention.” However, this understanding is not generally accepted by today’s philosophers. “Philosophers sometimes refer to conscious states as phenomenal or qualitative states. More technically, philosophers often view such states as having qualitative properties called “qualia” (singular: “quale”). There is significant disagreement over the nature and even the existence of qualia, but they are perhaps most frequently understood as the felt properties or qualities

of conscious states.”

“A distinction is also made between consciousness and self-consciousness, which plausibly involves awareness or consciousness of one’s own mental states (instead of something out in the world). Self-consciousness arguably comes in degrees of sophistication ranging from minimal bodily self-awareness to the ability to reason and reflect on one’s own mental states, such as one’s beliefs and desires. Some philosophers even hold that consciousness entails some form of self-consciousness.”

8.2 Western Philosophies of Mind

In Western philosophy, the mind is conceived as something that thinks, perceives, knows, experiences, holds beliefs and memories, desires and interacts with the external world, and so on. To explain such phenomena, some philosophers think that the mind is different from the body; some are of the view that such functions are performed by the brain; and there are also those who hold that the mind and body have a common origin. Accordingly, there are three main views concerning the nature of the mind and conscious mental states: dualism, materialism and idealism. Materialists hold that the mind is the brain, and the conscious mental activity is identical to neural activity. Idealistic theory “maintains the “real” is the nature of thought or that the object of external perception consists of ideas. It can also be the tendency to represent things in an ideal form, or as they might or should be rather than as they are, with emphasis on values.” According to this view, both mind and body belong to the same ideal and so have a common origin. These two views are in contradiction with the concept of reality in Jain philosophy. Dualism supports the Jain view, so I briefly describe it here.

There are two main forms of dualism. The first is mind-body dualism, which has three types:

1. **Substance dualism.** Substance dualism requires that the mind and body be composed of two ontologically distinct substances. The mind is comprised of a non-physical substance, while the body is constituted of the physical substance known as matter. “The mind is a thinking thing that lacks the usual attributes of physical objects:

size, shape, location, solidity, motion, adherence to the law of physics, and so on. If the conscious mind is not physical, it is more plausible to believe in the possibility of life after bodily death and immortality, as well as free will.” This type of dualism was famously defended by Descartes and is generally called Cartesian dualism.

2. **Property dualism.** Property dualism suggests that the “distinction between mind and body lies in the difference between the properties of mind and matter and that consciousness is ontologically irreducible to neurobiological and physical properties.” Property dualists claim that mental phenomena are non-physical properties of physical phenomena, but not properties of non-physical substances.
3. **Predicate dualism.** “Predicate dualism claims the irreducibility of mental predicates to physical predicates. Predicate dualists maintain that while there is only one ontological category of substances and properties of substances (usually physical), the predicates that we use to describe mental events cannot be re-described in terms of, or reduced to, physical predicates of natural languages.”

Dualism can also be classified by its views on mental causation. On this basis, we have five different classes of dualism: interactionism, epiphenomenalism, parallelism, occasionalism and non-reductive physicalism. According to parallelism (which is of interest to Jainism), “our mental and physical histories are coordinated so that mental events appear to cause physical events (and vice versa) by virtue of their temporal conjunction, but mind and body no more interact than the two clocks that are synchronized so that one chimes when hands of the other point out the new hour. In reality, mental causes only have mental effects, and physical causes only have physical effects.”

Dualism is supported by strong arguments. However, there are also arguments against dualism, as follows.

1. “If consciousness (the mind) can exist independently of physical reality (the brain), one must explain how physical memories are created concerning consciousness. Therefore, dualism must explain

how the mind affects physical reality.” “One of the main objections to dualistic interactionism is its lack of an explanation for how the material and non-material are able to interact.” If some external source of energy is responsible for the interactions, it would violate the law of conservation of energy.

2. There are clear correlations between certain mental and neural events. When the brain is damaged in some manner, the properties of the person are significantly compromised. “If the mind is a completely separate substance from the brain, why would the mind be affected when the brain is injured? Indeed, it is very frequently the case that one can even predict and explain the kind of mental or psychological deterioration or change that human beings undergo when specific parts of their brains are damaged.”
3. “Human beings (both phylogenetically and ontogenetically) begin their existence as entirely physical or material entities. Since nothing outside of the domain of the physical is added later in the course of development, then we must necessarily end up being fully developed material beings.”
4. “Why is it necessary to believe in the existence of two ontologically distinct entities (mind and brain) when it seems possible to explain the same events and properties in terms of one. It is a heuristic principle in science and philosophy to not assume the existence of more entities than is necessary for clear examinations and predictions.”
5. Why does the possessor of mental states have a privileged access to them that no one else can share? Hume objected that supposing that the mind is a thinking thing is not warranted, since all we apprehend of the self by introspection is a collection of ideas, but never the mind that has these ideas.

Based on this discussion, we find that Western philosophy lacks a clear distinction between the soul and the mind. While it is true that the term “soul” (or “spirit”) is often used instead of mind, the problem in philosophy is that it is unclear just how the soul is supposed to differ from the mind. The terms are often used interchangeably because it is unclear to many philosophers that the soul could be something other than

“the mental substance.” One might wonder, “even if the mind is physical, what about the soul:” maybe it is the soul, not the mind, which is non-physical. Jain philosophy clearly distinguishes between the non-physical soul and the physical mind.

8.3 Minds in Jain Philosophy

Jainism distinguishes between the soul and the mind. The mind is a special (virtual) structure of the soul that can analyze and synthesize perceptions. We have seen earlier in Chapter 6 that during its journey of development the soul acquires a mode with five senses and a mind. At this stage, the soul has a new structure (the mind) that helps with further progress. The development of the soul also implies the development of its faculties. The psychical faculties are the force behind the formation of the mind. This force helps the soul in the process of thinking, imagining, planning and taking decisions, feeling, and willing, quickly and in the real time that is required to make choices in the path of spiritual development. The physical mind does not possess consciousness, which is the exclusive property of the soul (and psychical mind), but it is manifested with the consciousness of the soul and is influenced by karma in its working. The state of the mind is a function of karma and changes with psychical karma. The mind is not a permanent entity; it exists only when consciousness manifests as thoughts, beliefs, desires, emotions and feelings.

Jainism recognizes two types of minds: (1) physical mind (*dravyamanah*) and (2) psychical mind (*bhavamanah*).

Physical mind. This is the physical counterpart of the psychical mind and is composed of *manovargana*, a subtle class of matter. This part of the mind interacts with the brain and nervous system. The physical mind attracts *pudgala* of *manovargana* from its surroundings during any mental activity. Good-quality *manovargana* enters the physical mind when *bhava*, thoughts, are good; these have favorable effects on the body. Bad thoughts have the opposite effects.

Psychical mind. This is the part of the mind that thinks, imagines, plans, discriminates and takes decisions. The psychical mind consists of the psychical impurity that is in action, of the soul or the impure mode of

the soul. The psychical mind has two divisions: *labdhi* (potential power), or the unveiled *jnana*; and *upayoga* (manifestation), its engagement with an object. A pure soul does not have a mind.

The mind has two properties: singularity and individuality. It can have only one thought at a time. If we had many minds, we could have many thoughts simultaneously. In contrast, the omniscient or pure soul has the power of plurality; it can conceive many thoughts and have full knowledge at one time. The physical and psychical (spiritual) parts of the mind are intimately correlated. The psychical mind cannot function without the physical mind. Together they perform mental activities. The physical mind exists because of the power of the soul and acts on a physical plane. The physical mind interacts with the environment and influences the soul. Thus the mind establishes a connection between the soul and its environment. The mind is not free in its operation; it depends on the state of the karma body and the physical body, particularly the brain. As long as the mind exists, this connection exists and the soul bonds karma. In the emancipated state of the soul, the veil of psychical karma disappears, the mind ceases to exist, and bondage of karma does not take place.

The mind is identified by its faculty of thinking, imagining, discriminating and memorizing. The mind remembers the past, thinks of the present and imagines the future. All of these activities are difficult to stop; making the mind “still” is a difficult proposition. When these activities are stopped, the mind ceases to exist. Mind is one but its modes are many; it can assume a mode as per our wish. Therefore the mind can present a thought from a multitude of perspectives.

The physical mind made up of subtle matter differs from the karma body, which is also made up of subtle matter. The karma body transmigrates with the soul, but the physical mind does not. It is created in each new birth. The subtle matter of both kinds can store and code information. The physical mind, like the karma body, also performs this function. Information is generated in the psychical mind by the cognition process, as discussed in Chapter 4, and is supposed to be recorded on the physical mind. The information in the physical mind is lost at death.

Besides cognition activity, the soul also learns from experience: we

learn to speak, learn languages, learn mathematics, and so on. Once learnt, these activities are repeated in our life. The soul performs repetitive activities very efficiently and it creates programmes for repeated use. These programmes are stored in the physical mind as codes. As our learning increases these programmes are updated by the soul.

I will now attempt to construct a simple model of the mind for further analysis of the interaction between the mind and body. We know that the karma body stores memories of past lives, which are also accepted by cognitive scientists to be present at the time of birth. The physical mind contains records of thoughts, beliefs, desires, emotions, feelings, and the memories of this life. We can, therefore, consider the karma body to be the unconscious mind and the physical mind to be the conscious mind in order to make a comparison between the Jain and modern views. The karma body actually performs a very wide range of functions compared to what is normally assigned to the unconscious mind, so a comparison between them requires some clarification. It would be more appropriate to consider the unconscious mind as consisting of two parts: the psychical unconscious, which directs the conscious mind, and the biological unconscious, which directs biological activities and the autonomic and other involuntary bodily functions. The former is a part of psychical karma and the latter is a part of biological karma. In higher organisms, the conscious mind may be assumed to develop as an extension of the fiery body, which also contains the “*prana*” body. We know by experience that the conscious mind and “*prana*” body are intimately connected and influence each other, and so may be considered parts of the same unit – the fiery body.

The conscious mind contains memories of this life, whether we remember them or not. The forgotten memories can usually be recalled through special attention or when reminded by someone else, so here they are not distinguished from memories we are conscious of. All memories can be retrieved and brought to the attention of the conscious mind. The memories of past lives stored in the unconscious mind also direct our drives, instincts, desires, needs and impulses, and influence the conscious mind. Sometimes we are not able to assign any cause for a particular action we indulge in, like how animal-like instincts in human

beings indicate our past animal history. If a source cannot be traced in this life, it must belong to past lives. This brings us to the question of the division of ego and super-ego in the conscious and unconscious mind. Freud's proposition that ego and super-ego are partly conscious and partly unconscious is supported here, but with the difference that the unconscious part is a karma record, the operation of which is based on rules different from that of the conscious part. Our actions and behavior are guided by the conscious memories of this life and the input from the unconscious mind as karmas.

8.4 Interactions between the Soul, Mind and Body

Jain dualism is a special kind of dualism. Instead of two levels of existence (the non-physical soul and material body, comprised of two ontologically distinct substances, as supposed in substance or Cartesian dualism), Jain dualism consists of three levels of existence: the soul, mind and body. This three-tier structure is applicable to all organisms and human beings. It is also true of heavenly and infernal beings, with the difference that they have a protean body instead of the material body of animals. The details of this structure vary a little between higher and lower organisms.

Higher organisms (vertebrates), are five-sense beings endowed with mind, including human beings and common animals. All such organisms have a developed brain. Figure 1 shows a proposed model of the interacting system of human beings. There are three distinct units: the soul, mind and body. The soul has no physical connection with the mind or body, and is related only to the karma body through the principle of parallelism. The mind and body are physical units that interact through radiation. The mind consists of the karma body and the conscious mind. The karma body is divided into two parts: psychological karma and biological karma. The fiery body is comprised of the conscious mind and the "*prana*" body. It must be remembered that the karma body, conscious mind, and "*prana*" body (made from "*karma vargana*," "*manovargana*," and "*tejasvargana*," respectively) are special kinds of fields and are coextensive with the material body.

their functioning.

The conscious mind interacts with the brain through *lesya* radiations. The brain is the center for information processing. The information in the brain is received from both the senses and the mind. All information in the conscious mind is presumably copied onto the brain and is available for processing. The conscious mind and the brain constitute a system in which the conscious mind contains the software and the brain contains the hardware. The capacity of the brain's hardware is very large; generally we are able to use only 5-7 percent of its total capacity. The processed information in the brain has two end-uses, one for the functions of the material body and the other for the mind. We thus have four broad kinds of information flow from the brain:

1. Input information received from the senses and biological activities and output information used for the material body
2. Input information received from the senses and biological activities and output information sent to the conscious mind
3. Input information received from the conscious mind and output information used for the material body
4. Input information received from the conscious mind and output information also used by the conscious mind.

The first case is the major application of the brain and involves motor, autonomic, and other functions of the body. In the second case, the processing of sensual and biological input is instrumental in the generation of thoughts, emotions, desires and feelings in the psychical mind and their storage in the conscious mind. In the third case, the thoughts and emotions stored in the conscious mind are processed by the brain, and signals are sent to various parts of the body to generate actions. No external input is required for this. In the fourth case, the conscious mind generates information by itself; thoughts from the conscious mind are processed in the brain and the output appears as new thoughts or mental states in the conscious mind. More than one type of processing can take place at a time. For example, input from the senses

may cause activity in the body as well as generate new mental states in the conscious mind; or, in a dream state, the input from the conscious mind may cause bodily activity in the form of rapid eye movements and generate new mental states in the form of feelings and emotions.

In Chapter 4 I described the structure of psychical mind and found that *buddhi* is one of its components. We recall that *buddhi* B is $(d_2)_p$ in the sleep state. Since the states of physical and psychical mind correlate, we see that the cognitive activity of the conscious mind is greatly hampered in the sleep state: it now perceives the generality rather than the particularity of the object. For instance, if an object is brought into contact we vaguely sense it but do not know what it is.

The conscious mind is a complex system working on the basis of various kinds of inputs. The main kinds of inputs that generate mental states or thoughts are: (1) active karma as defined in Chapter 4; (2) stimuli coming from the physical senses through the brain; (3) memories stored in the conscious mind itself; and (4) higher mental states generated by the conscious mind from previous mental states. The last component is a specialty of humans, who have developed the power of thinking and reasoning. One or more types of input may act at any one time to determine our conduct and behavior.

It is seen that the brain is an important component of the life system; neither mind nor body can function without the brain. In case of head trauma or brain damage, a part or all of the information in the brain is lost and its information processing activity is hampered, rendering the system incapable of proper functioning. However, in this case full information is still available in the mind; if the brain is restored to its initial or healthy state, the information from the conscious mind is again transferred to the brain and the brain resumes its normal functioning. However, it must be emphasized that brain activity is not independent, as believed by materialists; it is regulated by the conscious mind, which in turn is conditioned by the soul (psychical mind). The soul is the source of consciousness and intelligence, which acts through the mind on the brain and body. A definite correlation between mental activity and neural activity is a requirement of this system, but this should not be construed to mean that the brain itself possesses consciousness or intelligence.

Rupert Sheldrake is one of the few contemporary scientists who maintain that it is possible for memory to exist without the support of the brain. David Bohm concurs with him on this possibility. Sheldrake argues that just because we do not know of any memory without the brain, it does not follow that there cannot be any memory outside the brain. As all we know, the brain can act as a conduit through which memory (or consciousness) manifests itself, much like the antenna and wiring in a radio act as conduits for the electromagnetic waves that are then manifested as sound. Thus, just like the radio signal can exist (in the form of electromagnetic waves) outside the radio's antennas and wiring, memory can exist outside the brain.

“All conventional theories assume that memories are somehow coded and located in a memory store in the brain. When they are needed, they are recovered by a retrieval system. However, for a retrieval system to retrieve anything it has to know what it wants to retrieve; it thus must be able to recognize the memory that it is trying to retrieve. In order to recognize it, the retrieval system must itself have some kind of memory. Therefore, the retrieval system must have a sub-retrieval system to retrieve its memories from its store. This leads to an infinite regress.” Sheldrake, therefore, suggested that the brain is more like a tuning system. These arguments support the concept that memory exists outside the brain in the conscious (and also unconscious) mind. The brain, consisting of hardware, is the processing center.

The conscious experience identified by the “what it is like” sense is made by the soul, not the mind. The mind is a physical entity and is therefore devoid of the property of consciousness. The phenomenal property is also possessed by the soul. The term “conscious” in “conscious mind” denotes the property of the mind through which the soul makes conscious experiences; the mind itself is not conscious. The “*chetana*” manifests in the mind and body so the mind and the body can function in a given manner. No function of mind or body is possible without “*chetana*,” a dead body may have all the necessary organs and parts in place, but it cannot perform any action typical of life because the soul has left the body. Dualists assign consciousness to the mind and materialists assign it to the brain because the mind and brain function the

way they do in the presence of “*chetana*.” It is clear that consciousness is not a property of the physical mind or brain. The conduct and behavior of any being is determined by its karma and the “*chetana*” property of the soul. Jain dualism thus presents a theory of body, mind and spirit where the non-physical spirit manifests in the body and the mind, and the life processes are explained.

The main property of the soul that distinguishes it from matter is “*chetana*,” which is not just common “consciousness.” Philosophers hold that consciousness is “awareness” or “experience” in the conscious state, which is supposed to be absent in the unconscious or comatose state. “*Chetana*”, being a property of the soul, is always present; it manifests explicitly in the conscious state and implicitly in the unconscious or comatose state. Without “*chetana*,” no life is possible. The manifestation of “*chetana*” takes place in various ways, principally intelligence, awareness, bliss, and willpower. Jain philosophy assigns infinite capabilities to the soul that are fully realized when all of the soul’s karma is destroyed by special efforts (i.e. activities like austerity, penance, meditation, etc.). The state known as omniscience can be attained when an individual is able to annihilate all psychical karma. In such a state, the individual experiences the (super) natural powers of a soul with infinite intelligence, intuition, bliss and willpower. In the absence of psychical karma, the psychical mind and hence the conscious mind ceases to exist. This means that although the physical structure consisting of *manavargana* continues to exist, it does not function as a conscious mind.

What is intelligence? Intelligence is a property of the soul and does not belong to physical objects like the mind or brain. The soul possesses infinite intelligence, but this is limited by intelligence-obscuring karma. This means that the intelligence-obscuring karma does not allow the intelligence of the soul to fully manifest in the mind or brain. The reduction of intelligence-obscuring karma results in the increased manifested intelligence of an individual. In the presence of intelligence-obscuring karma, knowledge is relative (to karma) and an individual is not able to perceive an object in all of its reality. This is the reason that the principles, theories and explanations that are advanced by imperfect individuals who possess intelligence-obscuring karma are vulnerable to

change. A perfect person, i.e. an omniscient person who is free of intelligence-obscuring karma, knows the object in its absolute reality and is able to describe its nature as it actually exists.

8.5 Objections to Dualism Revisited

With this in mind, let us now revisit the objections raised against dualism as described in the beginning of this chapter. In the process of fetal development, the soul attached to its subtle karma body enters the newly fertilized ovum and modifies the DNA in accordance with its karma (through radiation). This process of entry cannot be directly known to science, since the soul is non-physical and the karma body is composed of subtle matter. Further growth and development of the fetus takes place according to the modified DNA. In Jain dualism, the interaction between the mind and body is through radiation and the principle of the conservation of energy is not violated. The soul does not directly interact with the conscious mind and body; its interaction with the karma body is based on the principle of parallelism and involves no energy transfer.

A correlation between the activities of the conscious mind and brain is a requirement of the system. The brain is the physical structure for the activity of the mind. The brain is the hardware, and the conscious mind provides the software. Neuron firing and other neuro-physiological activities in the brain are synchronized with the mental activity of the conscious mind. This is possible only when the brain is properly developed and functioning. In the early fetal stage or in a trauma state a suitable brain structure is not available, making required physical actions impossible. It would be wrong to assign mental capabilities to neural events as the materialists do; the driving force behind the neural activity is the mind, which actualizes the powers of the soul – the ultimate source of all activities, both conscious and autonomic, in the body. The objections of Hume and Kant that the mind and soul cannot be apprehended are the result of human cognitive limitations; a person with a heavy karma load is not in a position to do so. However, an omniscient soul with minimal psychical karma can apprehend the mind and soul; this soul has the direct, first-person experience of reality in its absolute form. Consciousness and intelligence are properties of the soul rather

than the mind or the brain. Consciousness exists in all organisms at all times and in all conditions, whether awake or in coma.

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The Epistemological Performance of Living Systems

9.1 Introduction

“*Jnana*” and “*darshana*” are two important *upayoga* (manifestations) of consciousness. There is no agreement among Jain scholars on the exact meaning of these two technical terms, and there are also no exact equivalents in English. However, it makes the most sense to suppose that they mean “intelligence” (or “potential intelligence”) and “self-awareness” (self-conscious) when used in reference to the soul, and “knowledge” and “awareness (being conscious of or to perceive)” when used in the context of the external world. These meanings are often used interchangeably.

Brahmadeva is of the view that from non-distinctive viewpoints the same consciousness, when it comprehends the self, is said to be *darshana* and, when comprehending the non-self, is said to be *jnana*. Neither *darshana* nor *jnana* can be said to be absent in a *jiva*, whether liberated or mundane, even for a moment. Every moment of a *jiva*'s existence must evince modes of *darshana* and *jnana* simultaneously.

We must clearly understand the difference between knowledge and awareness. Awareness is the comprehension of the generality of an object; knowledge is the comprehension of the particularity of an object. Usually we comprehend the generality of an object first, followed by the particularity of an object: awareness normally precedes knowledge.

9.2 Relation between Subject and Object

There are two important views on the relationship between a

subject and an object. Kundakunda (1st century BCE-1st century CE) in Pravachanasara says: "The knower has *jnana* of his nature and all the objects are within the range of *jnana*, just as the objects of sight are within the ken of the eye, though there is no mutual inference." Further, "The knower, who is beyond sense-perception stage, necessarily knows and sees the whole world neither entering into nor entered into by the objects of *jnana*." He says that *jnana* exists as both a power and as a function. The *jnana* power is confined to the body, but its function is not limited; in fact, it covers the whole universe. The soul is co-extensive with *jnana* and *jnana* is co-extensive with the object. *Jnana* operates on the object, just as a sapphire thrown in milk pervades the whole of milk with its luster. In the case of an Omniscient, the object of *jnana* comprises the whole physical and non-physical world.

The later scholars did not appreciate Kundakunda's explanation. Akalanka (7th CE) states that consciousness has two forms: the cognition form and the object form. The cognition form is like a mirror without any reflection. The object form is like a mirror with a reflection. The cognition form is common to all apprehensions, but the object form is different with every appearance. The cognition form is pure consciousness. The reflection in a mirror is just like its prototype. But the latter is not the content of the mirror. The mirror contains only the reflection. Similarly, *jnana* contains only the images. They distinguish one image from the other, not the physical objects. The content of *jnana* is not different from *jnana* itself.

Jainism holds that the soul does not come into direct contact with objects, nor are objects represented via media. Rather, they are illuminated by the soul when the obscuring karma is removed. Thus "jnana" (or knowledge) means the removal of this obscuring karma, which naturally results in the illumination of an object. The *jnana* does not take the form of an object and an object is not the cause of *jnana*. The object does not exist in *jnana*, it only manifests in it. Cognition never appears without an object. Whenever there is cognition it must be associated with an object.

9.2.1 Cognition: True or False

The objectivity or subjectivity of cognition has nothing to do with its truth or falsehood. Cognition is false when something appears in a context other than its own. False knowledge is that which represents things in a relationship in which they do not exist. Falsehood consists of them is representation of objective facts in experience. Illusion consists of the attribution of spatial, temporal or other relationships to the objects of our judgment that do not actually exist – but the objects themselves do actually exist, in other relationships.

The truth or falsehood of the context is ascertained by the subsequent correspondence or contradiction of the context. The criterion of falsity is not the subjectivity of the perception, but its contradictions. If a judgment is contradicted by another judgment that is unquestionably true, the first judgment should be rejected as untrue. Thus the problem of falsity is ultimately a question of experience. The problem of truth is no less a matter of experience and prior logic is absolutely incompetent to deal with it.

How do we explain cognitions made based on personal attitudes? These are concerned with *jnana* as well as feelings. When they are intermixed, it results in confusion. The cognition of every being (except that of the Omniscient) is alloyed with passions and other karmic effects that disfigure or colour the vision like coloured glasses. This disfigurement sometimes is of very high amount, which we then call illusion. When the amount of disfigurement is not so high, we consider it to be a valid cognition. The difference between these two is only of degree and not quality. The cognition of a layman is valid only to a certain degree. Nothing is absolutely valid or invalid. The difference between *jnana* and disfigurement (*ajnana*) is that the former results from the removal of obscuring karma while the latter results from karmic rise. The first depends on the object; the latter depends on the subject.

Jainism does not draw a line between true and false cognition as far as objectivity is concerned. The data of a false cognition is as objective as that of a true one. In true cognition a thing appears in its actual relationship, but in false cognition it appears in a perverted form. The reality or perverseness of its perception is ascertained only through its subsequent experience of correspondence or contradiction.

A thing possesses innumerable qualities independent of the perceiver. In the case of the soul, the derivative (*vibhava*) qualities are generated by a cause different from the pure self. While they exist, these qualities are as real as the natural ones.

The cognizer is free to choose any of the already existing qualities for his or her expression. He or she cannot impose anything new. All qualities and relationships are not physical. Existences are physical as well as non-physical. But non-physicality does not necessarily mean subjectivity. There are many non-physical objective qualities such as *jnana*, actions, etc., which are neither subjective nor physical.

9.3 Upayoga (Manifestation of Consciousness)

Upayoga is a general term comprising all activity related to consciousness. Literally, it means the attention or coordination of a subject and object. It is the manifestation of the faculty of knowing that is possessed by the soul. Cognition is also *upayoga*. This is of two types: *nirakaraupayoga* (general perception) of consciousness (inarticulate cognition) is *darshana* (or perception); *sakaraupayoga* (particular cognition) of consciousness (articulate cognition) is *jnana* (or knowledge). The articulate cognition is designated as *jnana* or *ajnana* according to the faith of the knower.

Siddhasena (2ndCE) defined *upayoga* in two ways: (1) consciousness, which is a constant characteristic of the soul, manifests itself as the stages of *jnana* and *darshana*. This manifestation is *upayoga*. (2) *Upayoga* means the attention of *jnana* and *darshana* towards an object. This definition can be applied to the case of constant cognition also.

Akalanka said that *upayoga* is a mode of cognizer, related to consciousness, occurring at the possible incidence of external and internal means. Is every mode of the soul an *upayoga*? No: only those which are related to consciousness. In fact, consciousness is power and *upayoga* is the manifestation (or application) of this power. There are two types of causes of *upayoga*: external and internal. Each of them is further divided into inseparable and separable. Thus there are four causes of *upayoga*:

1. External separable – an object, light etc.
2. External inseparable – the physical senses
3. Internal separable – the physical mind, material cause of thinking etc.
4. Internal inseparable – *bhava*-yoga or any activity of the soul that results from the partial or complete destruction of the karmic matter

In certain cases all of these causes are necessary; in others, three, two or even one will do. However, the 4th cause is essential in all activities.

Vidyananda mentions two types of *upayoga*: *ksayika* (emanating from the annihilation of karma) and *ksayopashamika* (emanating from the annihilation-cum-subsidence of psychic karma). The former does not require any external or separable means; it solely depends upon the fourth type of cause, which is always present. *Ksayikaupayoga* is permanent; once it appears it never vanishes. *Ksayopashamika* is impermanent; it appears and vanishes according to external and internal conditions. “Temporariness” here means a change in respect to objectivity, intensity, kind, etc., rather than a total disappearance.

9.4 Darshana

In the context of spirituality, which is the main theme of Jain philosophy, *darshana* is *samyaka* (right belief or faith) if the soul leans toward spiritual progress and believes in liberation as the highest goal. It is *mithya* (perverted faith) if the soul is engrossed in worldly pleasures. According to Siddhasena Divakara, *darshana* in the sense of attitude is to be included in *matijnana* (empirical knowledge). This is so until the 7th *gunasthana* (spiritual stage). The *ksayopashama* (annihilation-cum-subsidence of psychic karma) of *matijnana*-obscuring karma and the rise of the three degrees of *darshanamohaniya* (view-deluding) karma create a certain attitude of mind toward worldly objects, which is called *samyakadristi* (soul with right faith), *mithyadristi* (soul with perverted faith) or *misradristi* (soul with a partly enlightened view and partly deluded view), as the case may be. Beyond the 7th *gunasthana*, the aspirant receives *ksayikasamyaktva* (right faith), which is beyond the

range of *matijnana*. Though *ksayikasamyaktva* is possible in the 4th *gunasthana* also, the existence of other types of faiths is not ruled out.

As far as the cognizer and object are concerned, Jainism does not differentiate between *jnana* and *darshana*. *Darshana* is devoid of judgment; it is closer to awareness without any predication.

Regarding the actual nature of *darshana*, the Jain scholars hold widely different views:

1. Direct cognition is *darshana* while that obtained through a medium is *jnana*.
2. *Darshana* apprehends the present only while *jnana* is related to the past, present, and future.
3. *Darshana* is limited to the perception of mere existence while *jnana* begins with particularization.
4. *Darshana* represents the viewpoint of universality; *jnana*, that of particularity.
5. *Darshana* is cognition of particular object without knowing its particularity.
6. *Darshana* is the first two stages of *mati*, i.e. *avagraha* (knowing) and *iha* (speculation). *Jnana* begins with the third stage, *avaya* (judgment).
7. *Darshana* is identical to *vyanjana avagraha*; *jnana* proceeds from *artha avagraha* (first apprehension).
8. *Avagraha* is *darshana*, while subsequent stages of *iha*, etc. are *jnana*.
9. *Darshana* apprehends the self only, while *jnana* is related to external objects.
10. *Darshana* is the first inclination of the soul towards knowing something, preceding the contiguity.

Dhavala, of Digambara tradition, improves upon the last view, that *darshana* starts with the first inclination of the self to know the object. The main difference between the conventional (or Svetambara) view and Dhavala (Digambara) view can be summed up as follows:

Conventional View	Dhavala View
<i>Jnana</i> is a decisive knowledge of the self as well as the object; <i>darshana</i> is not decisive	<i>Darshana</i> and <i>jnana</i> are both decisive; <i>darshana</i> is related to the self while <i>jnana</i> is related to external objects
<i>Darshana</i> is the cognition of generality, while <i>jnana</i> is that of particularity	<i>Darshana</i> and <i>jnana</i> are both cognitions of generality as well as of particularity
Both <i>darshana</i> and <i>jnana</i> occur after the contiguity of senses with the object	<i>Darshana</i> is prior to contiguity, which is followed by <i>jnana</i>
Both are related to the self as well as to external objects	<i>Darshana</i> is related to the self while <i>jnana</i> is related to external objects
<i>Darshana</i> is not <i>pramana</i> (valid knowledge); <i>jnana</i> is both	<i>Darshana</i> is always <i>pramana</i> ; <i>jnana</i> is both

9.5 Indirect Cognitions

Indirect cognitions are of two types: Perceptual Cognition (also known as Empirical Knowledge) and Articulate Knowledge. In this section I will discuss each in turn.

9.5.1 Perceptual Cognition (or Empirical Knowledge) (*Matijnana*)

Perceptual cognition is the knowledge obtained due to the sense organs and the mind. This knowledge is conceptual consciousness and is determinate. The mind establishes contact with the external world through the senses. Sense signals are communicated to the brain, and then contacts are made with the mind. If the connection between the sense organs and the brain is broken, the mind cannot know the object. The thinking process starts when the object is perceived by the mind.

There are different elements of perceptual cognition. Perceptual cognition (*mati*) takes stock of a present objective datum; recollection (*smriti*) has reference to a datum perceived in the past; recognition

(*samjna*) is the cognition of the similarity of a past object of perception with another in the present; thought (*chinta*) is the cognition of a future event. All these varieties of cognition are considered identical despite the difference of perceptions because the substantive object is the same. *Abhinibodha* is a type of cognition that can view an object with all its temporal determinations in past, present and future. *Matijnana* (empirical knowledge) is a comprehensive class of cognitions. Thus, for example, there are purely sensuous cognitions, purely mental cognitions, and cognitions which are generated by both the senses and the mind. The cognition of beings from one-sensed beings to five-sensed beings without minds is purely sensuous. Recollection and instinctive intuition are purely mental. The normal cognitions of beings endowed with mind are generated by the cooperation of the mind and the senses.

Nandi divides *mati* into the following two varieties.

1. *Sruta nisrita* - the intellect based on scriptures or depending on verbal symbol. These are of four types (i) *Avagraha* - sensation, (ii) *Iha* - speculation, (iii) *Avaya* - judgment, and (iv) *Dharana* - retention.

Sensation means cognition of a generic character in the wake of the intuition of the contact between the sense and the object without the manifestation of any particular characteristic of the contact. The sensation is in respect of the *vyanjana* (possible object) and the *artha* (plausible object). The *vyanjana* sensation means indeterminate cognition of objects such as sound and the like through the contact between the object and the sense organ. This is a judgment like "there may be something." There occurs in the trail of this sensation another sensation called *artha*-sensation, which cognizes the object a little more distinctly, though devoid of the concepts of class, substance and attributes. This is a judgment like "there exists something." Speculation consists in the experience "this must be that." The speculation constitutes the intermediate stage between indeterminate perception and determinate perceptual judgment. Speculation is an attitude of the mind which leads to the determination of the specific character of the object by laying emphasis upon the real characteristics that are perceived and the elimination of the unreal attributes that are not cognized. Perceptual

judgment is the specific determination of the object “this is that.” The persistence of the perceptual judgment is called retention.

There are four categories of *matijnana*, perceptual cognition: (i) *jnana* due to sense organs, (ii) *jnana* exclusively due to mind, (iii) *jnana* due to joint activity of the senses and the mind, and (iv) *jnana* independent of both mind and sense organs viz, instinctive intuition. According to Jain epistemology, all cognitions are nothing but different states of soul and as such are only cases of emergence and not origination proper, the senses and the mind being auxiliary conditions or instruments only. Instinctive intuitions of the plant kingdom as well as underdeveloped animal organisms fall under category (iv). Memory, recognition and discursive thoughts are cases of *matijnana* under (ii) and (iii). Sensuous cognition of the five-fold sense data (touch, taste, etc.) is an instance of (i).

2. *Asrutanisrita*—the intellect based on sources other than scriptures. This includes the following four *buddhi*, (commonly translated as intellect).
 - a. *Autpattiki buddhi*. The sense of striking at the right point, which was never seen, heard or otherwise known before, and thus leading to a successful result is known as *autpattiki buddhi* (natural genius or intuition).
 - b. *Vainayiki buddhi*. The intellect of finding out a right solution in a complicated matter is known as *vainayiki buddhi*. It is attained through education and self-discipline, or by service to guru.
 - c. *Karmaja buddhi*. The intellect developed through practice in a particular vocation.
 - d. *Parinamiki buddhi*. The intellect attained through inference, reason, and other methods of rationality and ripened with the advancement of age is known as *parinamiki buddhi*. It helps in mundane as well as spiritual attainments.

9.5.2 Articulate Knowledge (*Srutijnana*)

Cognition that is made by the soul by the means of material symbols like words, gestures, etc. is called articulate knowledge. The

cause of articulate knowledge is *matijnana*. Really, this form of knowledge is *matijnana* with prolonged activity. *Srutijnana*, like *matijnana*, is also produced by the senses and the mind. Both empirical and articulate knowledge refer to states of the soul that has been transformed by the removal-cum-subsidence of obscuring karmas. Corresponding to such transformations are processes in the physical body: activities of the senses and mind, which are instrumental in the production of knowledge. In the case of empirical knowledge, the process goes through four steps (of sensation, etc.) as mentioned above. At the end of this process, the soul assumes a certain mode and the memory of the object or event is stored in the mind (and the brain). *Matijnana* and *srutijnana* are very much interdependent and it is difficult to separate them.

Articulate knowledge is also defined as the application of empirical knowledge. For instance, one learns that fire burns after placing a hand close to a fire. This is empirical knowledge that shows the burning quality of fire. Based on this knowledge, the measures taken to prevent burning, and to use fire for cooking and other purposes is articulate knowledge. The same knowledge of the burning quality of fire is articulate knowledge for the other individual who learns this without experimentation. It is therefore difficult to draw a line between articulate knowledge and empirical knowledge.

All beings, from one-sense to five-sense, possess both empirical and articulate knowledge. A soul could never be bereft of *matijnana* and *srutijnana*. In the case of beings that are not endowed with a mind, this knowledge is sensual. The sensing of sunlight by plants is empirical knowledge; the growth of branches toward sunlight is articulate knowledge. The sensing of moisture in the soil by plants is empirical knowledge; the growth of roots in the direction of moisture is articulate knowledge. In a laboratory experiment, worms were given cardboard to feed on. They refused to eat it a second time, but when bread was given they ate it repeatedly. The sense of what is worth eating is empirical knowledge; using this knowledge to select food is articulate knowledge.

All knowledge available in written or oral form irrespective of its source (e.g. the teachings of Omniscient individuals, scientific

investigations, etc.) is empirical knowledge in the strict sense and becomes articulate knowledge when it is understood and followed and when the corresponding transformation in the state of the soul of the reader takes place. Traditionally *sruti* refers to the Agamas, the canonical scriptures. The Agamas comprise of twelve *angas* and other texts written by *Acharya*. The *sruti* is of two forms: the *bhavasruti* and *dravyasruti*. *Bhavasruti* is the state of the soul and *dravyasruti* is texts containing teachings (and also in modern times the knowledge from all sources). *Dravyasruti* is the cause of *bhavasruti*; *bhavasruti* is the means of distinguishing between good and bad or between the soul and the body. *Srutijnana* can lead the soul to the state of omniscience: its importance has been compared to *kevaljnana*. A person with *srutijnana* can know all objects of the world, the present, past or future, and all modes and states. But this cognition is indirect. He knows but cannot directly perceive what is known. In this respect *sruti* is inferior to *kevaljnana*. Articulate knowledge gained with the help of the mind is much superior to that obtained without the mind. This is why human life is a rare opportunity of unparalleled value for a *jiva*.

The following are the steps in *srutijnana*:

Bhavasruti of the speaker → words → hearing → *bhavasruti* of the listener

Words and hearing are parts of *matijnana*; the *srutijnana* of the listener is preceded by *matijnana*. *Matijnana* and *srutijnana* have a cause-and-effect relationship: *matijnana* is the cause and *srutijnana* is the effect. *Dravyasruti*, texts, is the cause of *matijnana*: hence, *matijnana* is not preceded by *srutijnana*. In *matijnana* there is no obstruction between the senses, the conscious mind, and the object, so it is considered to be practically direct cognition. In *srutijnana* there is a word interface between the senses, the conscious mind, and the object, so it is not considered to be direct cognition. In *matijnana*, contact with the object is necessary, but it is not in *srutijnana*: merely by hearing the words, the soul perceives the object.

There are four characteristics of mental activity: (1) *buddhi* – thinking, understanding, imagining, memorizing, identifying, speculating, etc.; (2) enthusiasm – acting with eagerness and speed; (3)

entrepreneurship – converting ideas into actions; and (4) *bhavana* – having perseverance and zeal, constantly engaging with the activity.

There are fourteen varieties of articulate knowledge, which are (i) concerned with linguistic symbols, (ii) concerned with rational beings, (iii) authentic knowledge, (iv) knowledge that has a beginning, (v) knowledge that has an end, (vi) *gamika*, and (vii) knowledge that is included in the *angas* (canonical texts containing the direct teaching of Arihanta Mahavira, the Omniscient) and the opposites of these seven. These fourteen kinds of articulate knowledge are as follows:

1. Linguistic symbols: knowledge is communicated through words and the like
2. Non-linguistic: knowledge is communicated by gestures and other symbolic expressions
3. Relating to rational beings (endowed with a mind)
4. Relating to irrational beings (not endowed with a mind)
5. Authentic knowledge leading to emancipation
6. Spurious knowledge, consisting of faulty doctrines and views detrimental to emancipation
7. That which has a beginning
8. That which is without beginning
9. That with an end
10. That which is without an end

The last four varieties are divisions of the scriptures and are relative to actual treatises that have been written by some persons: as such, they each have a definite beginning in time. However, the knowledge recorded therein is without a definite beginning and without a definite end, since the world process is eternal at both extremes.

11. *Gamika sruti*, the twelfth *anga* called *Dristavada* in which some portions are repeated in accordance with the context
12. *Agamika sruti*, the scriptures that do not have repeated passages.
13. Scriptures included in the *angas* composed by the *Ganadharas*, the direct disciples of Mahavira.

14. Scriptures composed by authors other than the *Ganadharas*, i.e. *Acharyas*.

9.6 Direct Cognitions

Besides the above two types of cognitions involving the mind, there are three other types of direct cognition described in Jain philosophy. Direct cognitions arise from the soul without any external help: the soul apprehends objects that are remote, past, future, tiny, hidden, or otherwise non-cognizable through the senses. It is supernatural. These are manifested according to the partial or total removal of the corresponding obscuring karma.

1. *Avadhijnana* (Clairvoyance). *Avadhijnana* is the supernatural cognition of material objects. It resembles the clairvoyance and clair-audience (psychic hearing) of modern psychology.
2. *Manahaparyayajnana* (Mind-reading). According to Akalanka (7th CE), *manahaparyayajnana* has three stages: (i) *darshana*; (ii) cognition of the mind- substance; and (iii) cognition of conceived objects (by inference through *mati*).
3. *Kevalajnana* (Omniscience). *Kevalajnana* is attained when the obscuring karmic veil (*ghatin* type) is totally removed. It knows all objects in their entirety in all qualities and modes. It is the stage of omniscience: perfect knowledge. According to Kundakunda, *kevala* is natural (*svabhava*) while the other types are extra-natural (*vibhava*). Complete truth is found in the *jnana* of the omniscient only. Incomplete *jnana* is always mixed with more or less falsity. From the real viewpoint the soul is self-cognizant; it does not cognize anything else. But all objects stand reflected in the soul. The cognition of the soul, therefore, ultimately leads to the cognition of the entire universe.

9.6.1 Clairvoyance (*Avadhijnana*)

Clairvoyance is knowledge that is dependent on only the self (soul) and that takes stock of material substances as its objects. Clairvoyance is a limited form of cognition. In the case of the denizens of heaven and hell, clairvoyance is congenital: it appears immediately upon genesis. Cognition does not require the assistance of sense organs but emerges in

the soul directly and immediately. This happens only if the veils of obscuring karmas are held in check. In the case of denizens of heaven and hell, their very birth brings about the relevant destruction-cum-suppression of karma, and this is the direct cause of clairvoyance knowledge. In the case of other beings, i.e. humans and animals, clairvoyance is due to the occasional destruction-cum-suppression of the relevant obscuring karmas. Clairvoyance is limited to objects with a shape and form; it does not cognize formless substances like the soul, space, or time. Clairvoyance transcends the barriers of time and space that result from the destruction-cum-subsidence of the karmic veils. The highest type of clairvoyance will cognize all objects with a form, irrespective of their relative position in time or space; the lowest type can perceive a very small fraction of objects and can penetrate only a small part of time and space, and only a part of all modes. When a person has substantially destroyed the influences of karma, he or she acquires the power of direct knowledge of objects that are too distant, minute, or obscure to be observed by the ordinary senses and mind. Clairvoyance differs by degrees, according to the four parameters of space, time, matter, and modes. For example, from the point of view of space, clairvoyant perception extends from an infinitesimal part of space to the whole *loka*. Similarly, from the point of view of time, it extends from a fraction of a second to a large measure of time, including both the past and future.

Clairvoyance is six fold: (1) what follows the clairvoyant, (2) what does not follow the clairvoyant, (3) expanding clairvoyance, (4) contracting clairvoyance, (5) clairvoyance vulnerable to loss, and (6) clairvoyance not vulnerable to loss. Clairvoyance is also classified into three kinds: clairvoyance of space (*desavadhi*), corresponding to non-congenital form, and ultimate and universal clairvoyance (*paramavadhi* and *sarvavadhi*), which are possessed by monks and the Omniscient only. The former is liable to reverse, but not the latter two types.

Clairvoyance can also occur in perverted souls (*mithyadristi*); this is known as *vibhangajnana*. In this case the soul is not in a state to have a direct perception of objects. How do we explain the process of *vibhangajnana*? In this case the soul contacts some distant object beyond

normal sight. This means that the sense of vision and the brain are not participating in the experience. What else is at work? Perhaps the *prana* body helps here. As mentioned in Chapter 3, the *prana* body can produce a kind of wave, *prana* waves, which could help in making contact with a distant object. It is possible that *prana* waves are emitted from the *prana* body, reflected by the object in question and received again by the *prana* body. The received signals are processed by the conscious mind and the soul knows the target object. *Prana*, being subtle, is able to work at supernormal speeds and make fast communication possible. This kind of ability is also possessed by many yogis, who can contact distant objects and extend their field of knowledge. The range would depend on the strength of the *prana* waves and the ability of the mind to analyze the signals received. The image of the distant objects could be blurred or clear depending upon the performance of the mind. It is clear that such super-sensual experiences are beyond the capacity of the gross body and fall into the domain of the subtle cosmic world whose existence and laws have not been discovered by modern science.

Modern science has made great progress; today we are able to communicate with persons in distant parts of the planet via audio and video messages with the help of advanced communication facilities. We are also in a position to see any part of the globe through satellite imagery, such as Google Maps. In a way, these abilities can be said to compare with clairvoyance abilities, but these utilize the powers of *pudgala* and not that of the soul. This supports the view that *vibhangajnana* is a physical phenomenon and the application of the *prana* body in the process proposed above is a likely model of the event.

9.6.2 Mind-reading (*Manahparyayajnana*)

Mind-reading, or the cognition of mental modes, is the revealer of the modes of the substance of which mind is made. Mind-reading is the direct knowledge of the thoughts of others. Scholars are divided as to whether mind-reading should be conceived as perceiving the states and modes of mind alone, as held by Jinabhadra (7thCE), Hemchandra (11thCE), etc., or if it can also perceive external objects known to the mind, as held by Pujyapada Devanandi (6thCE). The latter view holds

that, since minds are conscious of objects, objects can also be perceived by mind-reading.

Mind-reading is of two varieties: Simple Direct knowledge (*Rijumati*) of simple mental things, viz., of what a person is thinking now; and Complex Direct knowledge (*Vipulamati*) of complex mental things, viz., of what a person is thinking now, what he or she thought in the past and what he or she will think in the future. Naturally, the latter is of purer quality and more lasting, more vivid though narrower in scope, and therefore superior in the spiritual sense.

Mind-reading is superior to clairvoyance in respect to purity, scope, and knowing the subject and content. Mind-reading takes cognizance of a larger number of details than clairvoyance does. Clairvoyance is possible in all four realms of existence (human beings, animals, and denizens of heavens and hells). Mind-reading, on the other hand, is possible only in human beings. Clairvoyance perceives all material objects that are possessed of colour and shape, whereas mind-reading is limited to the perception of an infinitesimal part of the substances known by the object person. A closer study will reveal that the line of demarcation between clairvoyance and mind-reading is not very clear; qualitatively, they appear to be of the same type.

9.6.3 Omniscience (*Kevalajnana*)

The term *kevala* implies independence from all sorts of aids. Thus *kevalajnana* is distinct from those types of knowledge that are determined by the destruction-cum-subsidence of karma. Perfect knowledge is not identical to clairvoyance and mind-reading. Rather, omniscience directly cognizes all substances, material and non-material, with all their modes, at all places and in all times; nothing is unknown to the Omniscient. It is a pure and perfect knowledge. The knowledge possessed by a perfect soul would consist of the knowledge of all that which its own nature is capable of revealing; it would, to a very large extent, not only be the knowledge of things that actually exist, but also the forms of all things that are possible. No details are superfluous or redundant for omniscience. Another characteristic of omniscience is that the omniscient being must comprehend all things simultaneously. When the soul possesses the capacity of knowing everything, it must know all

things simultaneously: for there is nothing to obstruct such a function of the soul. Like a mirror, it must reflect all that comes into its range. Hence omniscience must mean the simultaneous knowledge of all that is knowable in the world.

The experience, consequent upon the destruction-cum-subsidence of intelligence-obscuring karma, of a person with perverted faith (*mithyatva*) is called nescience (*ajnana*) on account of its association with the perversion. The types of nescience are three in number: the perverted forms of perceptual cognition, articulate knowledge and clairvoyance. The remaining two varieties of knowledge, viz. mind-reading and pure and perfect knowledge, can be possessed only by a person of right faith. As such, these two are necessarily varieties of knowledge and not nescience.

Intuition, non-conceptual and indeterminate consciousness, is possible in the case of ocular and non-ocular cognitions as well as in the case of clairvoyance and omniscience. Indeterminate cognition by the eye is called ocular intuition. Indeterminate cognition by the other sense organs or the mind is called non-ocular intuition. Such cognition in the case of clairvoyance is known as *avadhidarshana* and in the case of omniscience is known as *kavaladarshana*. The cognition of mental modes has no *darshana* because it never cognizes the general features of perception. *Mati*, *sruti*, *avadhi* and *manahparyayajana* are of the *ksayopashamic* type and *kevalajana* is of the *ksayika* type.

9.7 Instincts

Instinct is irrational knowledge that occurs without the assistance of the sense organs or the mind; it constitutes activity resulting from unlearned habits. This knowledge is gained by the *ksayopashama* of karma. Instincts exist in all kinds of beings, from one-sense organisms to human beings. Organisms without a mind, i.e. that are irrational, experience pain and pleasure through the physical body. Organisms with a mind, i.e. rational, have experiences through both the body and the mind. Some instincts may have a small knowledge component, but they are primarily habit-oriented. Instincts become less effective in the life of a rational being with the development of knowledge. With spiritual advancement and the eradication of karma, activities become more and

more knowledge-centered; in the *kevali* state, when all psychological karmas are eliminated, instincts cease to exist.

There are ten main instincts:

1. Food instinct (*Aharasamjna*). This is produced by the rise of feeling-producing and deluding karma. By this instinct, the organism searches for food. Food instinct is aroused by (a) hunger, (b) sight of food, or (c) thought of food.
2. Fear/Defense instinct (*Bhayasamjna*). This is produced by the rise of deluding karma. By this instinct, the organism undertakes defensive or offensive actions. Fear instinct is aroused by (a) the feeling of insecurity, (b) the sight of enemy or predator, or (c) the thought of fear.
3. Sex instinct (*Maithunasamjna*). This is produced by the rise of deluding karma. By this instinct, an organism engages in sexual activities. Sex instinct is aroused by (a) metabolic and chemical activity in body; (b) reading, viewing or listening to sex-related material; or (c) the thought of sex.
4. Possession instinct (*Parigrahasamjna*). This is produced by the rise of deluding karma. By this instinct, the organism is encouraged to store items of need or imaginary need. Possession instinct is aroused by (a) scarcity, (b) knowledge of availability and unavailability of goods, or (c) the thought of possession.
- 5-8. Instincts of Anger (*Krodha*), Ego (*Maana*), Deceit (*Maya*), and Greed (*Lobha*). These instincts are also produced by the rise of deluding karma.
9. Sensation instinct (*Oghasamjna*). This is instinctive knowledge attained at the level of special sensation, without the involvement of the senses or mind; it is the knowledge that occurs through subtle vibrations. By this instinct some organisms can pre-sense events, such as earthquakes.
10. Instinct of popular belief (*Lokasamjna*). This is a kind of instinct through which a specific sensation occurs on the perception of the object by the sense organs. By this instinct, a person follows the popular beliefs prevalent in the community without questioning.

Three more instincts are also recognized in Jaina texts:

1. *Hetuvadopadesiki*. The instinct of making propositions in which examples, cause and logic are used.
2. *Dirghakaliki*. This instinct consists of the cognitive faculty of mind through which the soul is capable of prolonged (and linked) contemplation of the past, present and future.
3. *Samyagdristi*. The instinct of having faith in the truth.

Besides the above, there are three kinds of aspirations (*aishanayen*) that also fall into the category of instincts.

1. Aspiration to live
2. Aspiration for wealth
3. Aspiration for offspring and their welfare

9.8 Knowledge and Perception in Western Philosophy

Epistemology, or The Theory of Knowledge, is the branch of philosophy concerned with the nature and scope of knowledge and how it relates to similar notions such as truth, belief and justification. It has been argued that epistemology should evaluate peoples' properties (i.e., intellectual virtues) instead of propositional properties. Belief is a subjective, personal basis for an individual's behavior, while truth is an objective statement that is independent of the individual. The terms knowledge and perception in Western philosophy are used almost in the same sense as *jnana* and *darshana*, of indirect type, in Jain philosophy although they differ in actual connotation. I here briefly review the Western philosophical views of knowledge and perception. This study indicates the complexity of the phenomena at physical level involved in the process of knowledge, perception, and cognition.

The (classical) definition of knowledge as "justified true belief" was widely accepted until the 1960s. In 1963 Edmund Gettier stated that, while justified belief in a proposition is necessary for that proposition to be known, it is not sufficient. In response to this, revised definitions have been proposed involving conditions, such as that justification for the belief must be infallible and that a true belief counts as knowledge only if it is produced by a reliable belief-forming process. Two types of conditions have been proposed:

Externalism: Externalists think that factors deemed “external,” or outside of the psychological states of those who gain knowledge, can be conditions of knowledge.

Internalism: Internalists claim that all knowledge - yielding conditions are within the psychological state of those who gain knowledge.

Knowledge may be acquired in two ways:

1. *A priori* knowledge is known independently of experience.
2. *A posteriori* knowledge is known by experience, i.e. it is empirical, or arrived at afterwards.

Certain views treat all knowledge as empirical and based on perceptual observation by the five senses, while others regard disciplines such as mathematics, economics, and logic as exceptions. Rationalists believe that knowledge is primarily (at least in some areas) acquired by an *a priori* process or is innate.

Constructivism considers all knowledge to be "constructed," in as much as it is contingent on convention, human perception, and social experience.

Perception is the ability to take in information via the senses and process it in some way. Vision and hearing are two dominant senses that allow us to perceive the environment. The study of hepatic (tactile), olfactory, and gustatory stimuli also falls into the domain of perception. Much of our perception is representational: we take the world to be a certain way, sometimes correctly and sometimes incorrectly.

It also seems that there is a form of perception that does not require the possession of concepts (although this claim has been questioned). It is plausible to claim that cognitively unsophisticated creatures, i.e. those that are not seen as emerging in conceptually structured thought, can perceive the world, and that at times we can perceptually engage with the world in a non-conceptual way. Perception that does not involve conceptual structuring is called “simple seeing.” This perception involves the acquisition of information about the world that enables us to virtually discriminate objects and to successfully engage with them, but also of information that does not amount to one having a conceptually-

structured representation of the world. These are all forms of perceptual experience, of causally engaging with the world using our sensory apparatus, and that have a distinctive conscious or “phenomenological” dimension. Seeing, in its various forms, strikes our consciousness in a certain way.

“The term “sensation” is used to refer to the conscious aspect of perception, but note that one can have sensations even when one cannot not be said to perceive the world. When hallucinating or dreaming, for example, one has sensations that usually characterize perceptual experience, even though one’s experience cannot be described as perceptual, *per se*.”

Consider how these various kinds of perceptual experiences are related to our perceptual beliefs. Perceptual beliefs are those concerning the perceptible features of our environment, and are grounded in our perceptual experience of the world. Just how our perceptual beliefs are grounded in our perceptual experience is a contentious issue. There is certainly a causal relation between the two, but some philosophers also claim that it is perceptual experience that provides justification for our perceptual beliefs.”

“Objects of perception are the entities we attend to when we perceive the world. Perception lies at the root of all our empirical knowledge. We may have acquired much of what we know about the world through testimony, but originally such knowledge relies on the world having been perceived by others or ourselves using our five senses: sight, hearing, touch, taste, and smell. Perception, then, is of great epistemological importance. In the following sections, I briefly review the theories of perception.”

1. Direct Realism

Perceptual realism is the common-sense view that objects exist independently of perceivers. Direct realists also claim that we directly engage with these objects: it is these objects themselves that we see, smell, touch, taste and listen to. “There are, however, two versions of direct realism: naïve direct realism and scientific direct realism. They differ in the properties they claim the objects of perception possess when

they are not being perceived. Naïve realism claims that such objects continue to have all the properties that we usually perceive them to have. Scientific realism, however, claims that some of the properties an object is perceived to have are dependent on the perceiver, and that unperceived objects should not be assumed to retain them.”

“Scientific direct realism is often discussed in terms of Locke’s distinction between primary and secondary qualities. The Primary qualities of an object are those whose existence is independent of the existence of a perceiver. The secondary qualities of objects, however, are those properties that do depend on the existence of a perceiver. In the former interpretation, a cup itself is not yellow, but the physical composition of its surface, and the particular way this surface reflects light rays into our eyes, causes in us the experience of seeing yellow. In the latter interpretation, for an object *to be yellow* is for it to be disposed to produce experiences of yellow in perceivers. “The secondary qualities, then, comprise such properties as color, smell and texture.

2. Indirect Realism

“The indirect realist agrees that the cup exists independently. However, through perception I do not directly engage with this cup; there is a perceptual intermediary that comes between us.” “This intermediary has been given various names like "sense datum," and the plural, "sense data." Sense data are mental objects that possess the properties that we take the objects in the world to have. They are usually considered to have two rather than three dimensions. I perceive the coffee cup by virtue of the awareness I have of the sense data that it has caused in my mind.”

We also look at the stars in the night sky. It is a fact that the star at which we are currently looking may have ceased to exist. How can we, then, be directly attending to that star when it is no longer there? This argument can be applied to everything we perceive. One should, therefore, accept that all the events we perceive are to some extent in the past.

There are many neurophysiological features and physiological entities such as retinal images that are involved in perception. They are, however, intermediaries in a different sense. They are simply part of the

causal mechanism that enables us to perceptually engage with objects. So we do not have any reason to give up direct realism.

Illusions occur when the world is not how we perceive it to be. When a stick is partially submerged in water, it looks bent when in fact it is straight. We can also have hallucinations in which there is nothing actually there to perceive at all. If the bent shape is not a physical object, it must be something mental, the “sense data.” According to Locke, “the mind perceives nothing but its own ideas” (ideas are mental components akin to sense data).

Sense data are seen as inner objects, and are incompatible with a materialist view of the mind. Indirect realism is committed to dualism. The first and greatest problem for the dualist concerns explaining the interaction between mind (soul?) and body. “A non-physical sense datum causes physical movement. Such causal relations seem to be counter to the laws of physics. The physical view of nature aims to be complete and closed: for every physical event there is a physical cause. The only way to maintain both physical closure and the causal efficacy of the mental is to claim that there is over determination, i.e. that the physical action has two causes, one involving sense data, and one involving purely physical phenomena, either of which is in itself sufficient to bring about that action. “

A second problem associated with the non-physical nature of sense data concerns their spatial location. The relative positions of physical objects in physical space must more or less correspond to the relative positions of sense data in our private spaces. But the non-physical does not have spatial dimensions.

Another problem with indirect realism is adverbialism. Our perception should be described in terms of adverbial modifications of the various verbs characteristic of perception, rather than in terms of the objects to which our perceptual acts are directed. Indirect realism also invokes the *veil of perception*. All we actually perceive is the veil that covers the world, a veil that consists of our sense data. What, then, justifies our belief that there is a world beyond that veil?

3. Phenomenalism

Phenomenalists hold that propositions about the physical world should be seen as propositions about our *possible* experiences. Physical objects can exist unperceived since there is the continued *possibility* of experience. For Phenomenalists, there is no world independent of our (*possible*) experiences.

For many, the idealistic nature of phenomenalism is unpalatable. A consequence of phenomenalism would seem to be that if there were no minds then there would be no world. A key argument against phenomenalism is the argument from perceptual relativity. There are no laws like conditional statements that describe the relation between sensations considered in isolation from physical aspects of the perceiver and of the world.

4. The Intentional Theory of Perception

“Intentionalists emphasize parallels between perceptions and beliefs. Beliefs possess “*about*”-ness or what philosophers of mind call “intentionality.” Intentionality is considered to be an essential feature of the mind (soul), and it describes the property that certain mental states have of representing –being about – certain aspects of the world. The aspects of the world that a belief is about can be specified in terms of its *intentional content*. The intentionalist claim is that perceptions are also representational states.”

There are problems associated with accounting for the phenomenological features of perception. Our experience consists in more than simply representing that the world is a certain way; it is also the case that the way we acquire representations strikes our consciousness distinctively. There is, however, something “it is like” to be having such representations. Our experience has a phenomenological dimension, a dimension that you are probably currently imagining. The intentionalist, therefore, must also account for these phenomenological properties of perception.

One route that the intentionalist could take is to identify the phenomenological aspects of our experience with the representational. The second broad response to the phenomenology of experience is to claim that representational properties alone cannot account for perception, and thus one should reject the intentionalist project. If one is

to account for what it is like to perceive the world, then one also requires sensational properties (properties distinct from those relevant to representation). Concepts of sensation are indispensable to the description of the nature of any experience. Some philosophers favor the existence of *qualia* (singular: *quale*). These are seen (by some) as the *non-representational*, phenomenological properties of experience. Others take *qualia* to be essentially private, and our knowledge of them to be incorrigible.

5. Disjunctive Accounts of Perception

“Disjunctivism denies the key assumption that there must be something in common between veridical and non-veridical cases of perception, an assumption that is accepted by all the positions above, and an assumption that drives the argument from illusion. For the disjunctivist, these cases certainly *seem* to be the same, but they are, however, distinct. This is because in veridical perception *the world* is presented to us. The world is not just represented as being a certain way, as for the intentionalist; but rather, the world partly constitutes one’s perceptual state. Thus, one’s perceptual state when hallucinating is entirely distinct from one’s perceptual state when actually attending to the world.”

“Disjunctivism can avoid the argument from illusion since it does not accept that veridical and non-veridical perceptual states are in any way the same (they only seem to be). Intentionalists answer the argument from illusion by claiming that veridical and non-veridical perceptions have a type of representational state in common, whereas disjunctivists undercut the argument by claiming that there is no need to posit such a common factor.”

“However, in any particular case the disjunctivist must accept that he cannot tell which disjunct holds. When prey to illusion or hallucination, it can seem to you as if you are really perceiving the actual state of the world, and thus, it seems to you that you are in the same perceptual state that you would be in if the world was really how you perceive it to be. A consequence of disjunctivism, then, is that one can be not only deluded about the state of the world, but also about the state of one’s own mind. “

A consequence of disjunctivism is that two physically identical brains can be in distinct perceptual states. “The contents of the brain alone do not determine the nature of our thoughts and experiences. There is, however, some notion of supervenience maintained in that the mind supervenes on the brain together with its causal links to the environment: if there are two identical brains causally connected to the same features of their environment, then the mental states manifest in those brains must also be identical. Various arguments have been forwarded for this externalist position. Thought content is not in the head. Disjunctivists hold a parallel claim: since it is the state of the world that determines the content of one’s perceptual state, hallucinations have nothing perceptually in common with veridical perceptions even though all could be the same inside one’s head. “

9.9 Embodied Cognition

The central claim of embodied cognition is that an organism's sensorimotor capacities, body and environment not only play an important role in cognition, but that the manner in which these elements interact enables particular cognitive capacities to develop and determines the precise nature of those capacities. “To say that cognition is embodied means that it arises from bodily interactions with the world. The contemporary notion of embodied cognition stands in contrast to the prevailing cognitivist stance, which sees the mind as a device to manipulate symbols and is thus concerned with the formal rules and processes by which symbols appropriately represent the world.”

“Embodied cognition theorists contend that thought results from an organism's ability to act in its environment. More precisely, what this means is that as an organism learns to control its own movements and perform certain actions, it develops an understanding of its own basic perceptual and motor-based abilities, which serve as an essential first step toward acquiring more complex cognitive processes, such as language. Thus, goal-directed actions are described as primary for embodied theorists because these theorists argue that thought and language would not occur without the initial performance of these actions. In essence, these low-level actions and movements are viewed as

necessary for higher cognitive capacities to develop.” Thought grows from action and activity is the engine of change.

“Most embodied cognition theorists believe that the embodiment of an organism simultaneously limits and prescribes the types of cognitive processes that are available to it. In other words, the particular way in which an organism is embodied (e.g., whether it has feet, fins, eyes, a tail, etc.) will influence how it performs goal-directed actions in the world and the particular sensorimotor experiences connected with these actions will serve as the basis for category and concept formation.”

“In general, environmental factors are very important because they can influence not only what options are available to a particular organism, but also why an organism might choose one option over another when performing a particular goal-directed activity. For instance, weather conditions, the size of the ball, the rules of the game, and whether or not an individual has any broken limbs will most likely factor into their decision to throw or kick the ball. Yet, all of this person's past experiences with an object in these varied activity-based contexts will in some way contribute to their current understanding of the activity. The individual's understanding of these past experiences is directly informed by the kinds of sensorimotor experiences their form of embodiment allows. The various sensorimotor experiences that occur while performing an action in a particular environmental context further specify the type of categories/concepts the organism is capable of forming.”

“In conclusion, the way in which we are embodied determines the type of action patterns we can perform; these action patterns shape our cognitive functions (i.e., the way in which we can conceptualize and categorize). This is because most embodied cognition theorists argue that category and concept formation is made possible and constrained by the particular sensorimotor experiences of the organism. It is in this sense that the form of embodiment partly determines the kind of cognitive processes available to the organism. Many researchers agree with the theoretical assumption that the form of embodiment partly determines

the cognitive processes available to the organism, but they still debate precisely how this occurs.”

“Based on the analysis of the above theoretical assumptions of embodied cognition, it is now possible to directly contrast the central themes of the embodied cognition research program with those commonly expressed in the classicist/cognitivist research program:

	Classicist/Cognitivist View	Embodied Cognition View
1	Computer metaphor of mind; rule-based, logic driven.	Coupling metaphor of mind; form of embodiment + environment + action constrain cognitive processes.
2	Isolationist analysis - cognition can be understood by focusing primarily on an organism's internal processes.	Relational analysis-interplay among mind, body, and environment must be studied to understand cognition.
3	Primacy of computation.	Primacy of goal-directed action unfolding in real time.
4	Cognition as passive retrieval.	Cognition as active construction based upon an organism's embodied, goal-directed actions
5	Symbolic, encoded representations	Sensorimotor representations”

Although most embodied cognition accounts do adhere to the theoretical assumptions outlined above, it is important to recognize that this rapidly changing research program encompasses a diverse group of theorists, who are continuing to refine and revise the preliminary theoretical assumptions associated with the embodied cognition view. The ultimate claim of embodied theorists is that new insights into previously unanswered questions concerning cognitive development will be attained if cognitive scientists re-orient their approach and conduct research in a manner that acknowledges the crucial links existing among an organism's brain, body, and world. “Some researchers argue that it would be a mistake to completely dispense with the theoretical tools associated with classicist/cognitivist models, especially since it is unclear if embodied cognition accounts will be able to adequately explain higher

level processes (e.g., meta-cognitive states such as the ability to think about one's own thoughts) without invoking on some level a computational or representational analysis. “

9.10 Omniscience & Divine Knowledge

In this section, I present the philosophical view of Omniscience. Omniscience is the attribute of "having knowledge of everything." Is true belief the same thing as knowledge? Not all knowledge is usually considered to be a true belief if it is either based on sufficient evidence (or a proper ground) or is formed in the right way. “Some argue that, strictly speaking, at the bottom it is not beliefs that are true; instead, it is sentences or propositions. When we believe that "snow is white" we believe that this sentence (or proposition) is true. Thus God's knowledge is ultimately of sentences, propositions, or whatever the real truth-bearer turns out to be.” “If a person has a dispositional belief, this means he should be disposed or inclined to have an occurrent belief in a proposition if he were to think about the proposition.” “A dispositional account of beliefs is suitable for making sense of limited human cognitive activity, but would be deficient for a perfect thinker. If it is possible to make sense of a being that can be aware of all propositions simultaneously it is preferable to think of all of God's beliefs as occurrent. Dispositional beliefs are adequate for finite humans, but the goal is always to be aware of everything that one believes.”

God has no beliefs. “Alston thinks that God's knowledge may be thought of as propositional without God having beliefs. An alternative view is that God does not grasp the truth of propositions; rather, he is immediately and directly aware of the world without any propositional intermediaries that are about the world.”

There is no difference between God (*jnata?*), his knowledge (*jnana?*), and the objects of God's knowledge (*jnayeya?*). So the object of God's knowledge turns out to be God's own essence. God's essence contains within it the likeness of everything and God knows everything by knowing his own essence.

“For humans, we do not have understanding until we begin to separate our knowledge from known things and separate a scene into distinct sets of facts. Yet we lose and long for the underlying unity of the initial awareness. God, it may be thought, retains this unity and can have understanding without the piecemeal, discursive thought present in human reasoning.”

“We humans are limited. We cannot understand any concrete thing without abstracting from it and formulating propositions about its abstract features. For example, we cannot understand Jimmy Carter but only various aspects of him: that he is a Democrat, that he is human, and so forth. But God is not limited. His knowledge is complete. God can understand everything about Jimmy Carter all at once without separating aspects of him from Jimmy Carter. He does this by knowing Jimmy Carter himself. So there is no reason for God to employ proposition if this knowledge is unlimited in the way just described. Since God does not have to employ propositions, he has no need of beliefs. “

“Intuitive knowledge just seems like a superior kind of knowledge. Since God is perfect he should be thought of as having this superior kind of knowledge, knowledge without beliefs. “

“A cognitive faculty is simply a particular ability to know something. Perception is an example of a faculty of human cognition that allows us to know about the physical world. Memory is the faculty that allows us to know about the past.”

“When we are reasoning inferentially, we are employing arguments. Thus inferential evidence can come as deductive, inductive, or abdicative argument.”

“The faculty of memory provides immediate knowledge of the past. The question of whether or not God remembers things is essentially tied to questions about God's relationship to time. If God is atemporal, then he would have no memory, since memory consists of being aware of a past experience. But if God is atemporal, then he would have no past experience to recall. Thus God only has memory if God is an atemporal being.”

A number of philosophers have postulated that God is not in time but "sees" all of time from his eternal perspective. Boethius describes God's eternal existence as follows: "Eternity is a possession of life, a possession simultaneously entire and perfect, which has no end. That which grasps and possesses the entire fullness of a life that has no end at one and the same times (nothing that is to come being absent to it, nothing of what has passed having flowed away from it) is rightly held to be eternal."

"God is not like humans who exist wholly at each finite moment in time and endure through time. A human possesses life only in a small finite window, which we call "now." The past life is no longer possessed; the future is not yet realized. Since our human life is lived in a finite "now," it is never full and complete but fragmented. God, however, is perfect and God's life is not fragmented like the life of a temporally enduring human. He lives in the eternal "now." His "now" stretches over our past, present, and future. Our finite present is representative of God's eternal present, but our finite present is only a faint and imperfect model. Thus by being eternal the future is not off in the distance for God, but is subsumed under his eternal presence. Since God wholly exists at all times in his eternal "now" he can know what happens at every time "(compare this with *kevali*).

The eternity attributed to God, or the Omniscient, can be understood by reviewing the concept of time in Jainism. Jainism describes two types of time: absolute time, or *nischayakala*, and empirical time, or *vyavaharakala*. Absolute time is held to be a passive agent for the change of modes of *dravyas*, or substances. Absolute time does not change the modes, but its existence is assumed to be necessary for substances to change their modes. Absolute time is the auxiliary cause of the change of modes; the main cause of change is the substance itself. Empirical time measures the duration of events and is defined by the movement of some preferred object. For example, on planet Earth time is defined with respect to the relative movement of the Sun and Moon; correspondingly, we have a solar calendar and a lunar calendar. It is obvious that on any other Earth-like planet in the universe, empirical

time as defined with respect to some local object may be entirely different from the time we are familiar with. It must be noted that empirical time is defined by *pudgala* for *pudgala*, and it has no relevance to non-physical substances. As we know that a living being is a combination of a soul and a body, the notion of time as experienced by us is due to the presence of the body. If the body were absent, the *jiva* would not experience empirical time. For example, in the liberated state the *jiva* does not have such an experience; it only experiences eternal existence. The same holds good for the omniscient or *kevali* when he experiences the transcendental state, losing consciousness of his body and mind; in this state he knows the self by the self and the body is no longer in the range of his consciousness. Thus the omniscient is an atemporal being and for him the past and future are eternally integrated into the present. In the absence of psychical karma, the soul is in a very pure state; all objects in the *loka* are reflected in this soul due to the properties and powers described in Chapter 1. The pure soul knows everything in the *loka* as they are, as well as their past and future modes, since empirical time is meaningless to the Omniscient.

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10

Types of Knowledge and Standards of Intelligence

10.1 Introduction

The concept of knowledge has been described in Chapter 4. Knowledge is the manifestation of the intelligence (*jnana*) property of the soul (*jiva*) with respect to its comprehending capacity. The knowledge generated by the cognition process is stored as *bhava* karma, which is impurity of the soul. This knowledge is also known as *vijnana*, i.e. *vijnana* is the manifestation of the *jnana* property that is brought about by the cognition process. *Vijnana* (knowledge) may concern external objects, the body, the mind, or the soul itself. It comprises the information about these objects that is acquired by both direct and indirect methods of cognition. In worldly existence, both *jnana* and *vijnana* are important for the soul, as they guide its actions and behavior and affect its performance at all levels, whether personal or social.

The knowledge of a soul may be valid or invalid depending upon whether it describes truth or untruth. This is a point of much debate in philosophy and I present arguments on this issue below.

India is a land of philosophies. Different thinkers have expressed diverse views, and scholars were faced with the problem of deciding the right one. Justifying and arriving at the right view is called *nyaya* (logic), and the study of this process is called *nyaya-shastra*. The main parts of this process are

1. Soul – the decision taker or analyzer
2. Valid knowledge for justification, *pramana*
3. The object of analysis
4. The result of the analysis – the decision in favour of the right proposition

Jain philosophy admits that objects have multiple aspects and can therefore be described in many ways, each of which might be correct in a particular context. The knowledge that helps to arrive at the right decision is accepted as valid knowledge, or *pramana*. The invalid knowledge gives rise to (a) *samsaya*, doubts; and (b) *viparyaya*, illusion or misapprehension, i.e. knowing a thing in a form that is not its true form.

10.2 Naya (Non-absolutist Standpoint)

Knowledge is acquired from two sources: sensuous consciousness and transcendental consciousness. Thinking is related to sensuous consciousness; in transcendental consciousness there is vision and introspection but no thinking. According to Jain doctrines, the knowledge gained from sensuous consciousness is only a partial knowledge of a substance. A person that possesses sensory consciousness only knows a part of the substance. This partial knowledge may become the subject of controversy. Five individuals may gain knowledge about five different aspects of any one substance, and each of them believes his own knowledge to be true and that of the others to be untrue. In Jain philosophy an effort has been made to change this approach and understand truth through right vision; this is called "*Nayavada*."

The non-absolutist standpoint (viewpoint or way of approach and observation) cognizes a single attribute of an object that is possessed of infinite attributes. This is a viewpoint expressing the intention of the speaker (knower), which takes cognizance of a particular (intended) aspect of the object, apprehended through *Pramana* (valid organ of knowledge), and which does not repudiate other aspects (of that reality).

Naya is a point of view, a vision, and a way of thinking. However, according to Siddhasen Divakar there are as many *naya* as there are ways of speaking. This kind of extensive approach makes contemplation very difficult. It becomes problematic for the listener or learner to come to any tangible conclusion. In order to simplify this problem, the Jain *Acharyas* have described two separate points of view:

1. *Dravyarthiknaya* (the substantial point of view) – describing a thing with respect to its ultimate substance, i.e. its persistence or permanence.
2. *Paryarthiknaya* (the modal point of view) – describing a thing with respect to its modification, i.e. its origination-cessation or impermanence.

These two views have been delineated for the convenience of contemplation and veridical ruling. In fact, thoughts cannot be made veridical by dividing them into the permanent and impermanent. For the exposition of the persistence of thoughts, the substantial viewpoint is adopted; for the exposition of change, the modal point of view is adopted. Both points of view are relative. Nowhere is persistence completely independent of change or vice versa. Yet, to obtain a holistic understanding of existence this arrangement is deemed fit. The substantial point of view analyses the persistence of oneness but does not completely rule out change, as every viewpoint has its own limitations. It does not believe in polemics of the subject matter. Relativity means that there is nothing absolute. One *naya* only analyzes a portion of the whole, so naturally the remaining portion too remains allied to it. This perception clarifies the theory of relativity of perception.

This relativity is also expressed in words, for as many viewpoints exist as there are ways of thought. The basis of this argument is its mode.

Modes are innumerable, hence viewpoints too are innumerable. Only does the combination of innumerable parts enable us to realize the substance in its totality. It is not a correct perception to believe that one mode constitutes the whole. *Naya* is in no way a false perception. It bears no eagerness to perceive wholeness in a portion; it is not an exposition of absolute truth.

Divergence and identity are two broad areas of contemplation. Identity does not affect behaviour. Divergence becomes the cause for conflict and disharmony. When dwelling on philosophical ideas, it is divergence which gives rise to conflict. The Jain philosophers have endeavored to amalgamate identity and divergence and reduce ideological conflict. According to the *anekanta* school of thought, total identity and total divergence are absolutist approaches. With these approaches, truth cannot be explained properly.

All *nayas* are in perfect harmony with the law of *anekanta*, i.e., when the mundane soul is viewed in its pure and perfect state in accordance with its ultimate aspect, its worldly state (as per its empirical aspect) is not denied, but rather ignored for the time being. The pure soul, being non-corporeal, cannot be perceived by the sense organs and is an object of pure and perfect knowledge (omniscience) only. But the soul, even in the purest state, neither surrenders its individuality nor relinquishes its dynamic constitution and continues to possess its own pure qualities. It must always be remembered that the soul's pure/emancipated state of existence and the worldly embodied state are both equally real, yet neither of them is an Absolute Truth.

10.3 The *Pramana* Type of Knowledge and its Essential Nature

Pramana is a valid organ of knowledge:

1. That cognition, through which determination of itself and others is made
2. That cognition, through which right determination of the object is made
3. A limb of logic (*naya*); that valid cognition, which is without doubt and contradiction.

Naya is not the only form of knowledge. "Knowledge is accomplished," says Umasvati, "by means of *pramanas* and *nayas*." Generally we come across two types of knowledge. First, there is a type that follows the fragmentary process of comprehension and touches only a slice of reality. The other type of knowledge aims at giving a comprehensive view of the real. The *pramana* and *naya* types of knowledge are distinguished by their total and partial approaches to the real. Devanandi says: "A *pramana* takes the whole of a real as its subject-matter." Vimaladasa also mentions: "A total comprehension of reality is the knowledge of the *pramana* type." This may appear to lead to the impossibility of the *pramana* type of knowledge. Our experience testifies to the fact that we are never able to comprehend the totality of reality. Samantabhadra, therefore, has well said: "The knowledge of reality which enlightens the whole of it simultaneously is the *pramana*." Thus perfect knowledge or the *kevalajnana* alone can be designated as the *pramana* type of knowledge; in the lower stages of existence, a *pramana* cannot be experienced. In Jain works, along with *kevalajnana*, sensuous knowledge, scriptural knowledge, clairvoyance, and mind reading have also been enumerated as yielding the *pramana* type of knowledge, though they never apprehend reality as a whole. The totality common to all of the aforesaid types of knowledge must not be taken to mean the all-inclusive totality of reality, whose comprehension is held to be possible only in the perfect stage. All of the *pramana* types of knowledge except perfect knowledge comprehend reality only partially, and the total comprehension of reality does not form the criterion for the *pramana* type of knowledge. Hence, in the *pramana* type of knowledge the presumed totality is not vitiated by the fact that it does not comprehend reality as a whole. This also leads to the conclusion that *pramana* knowledge is possible in spite of the fragmentation it may involve.

Similar meaning is given to the term *sakaladesa*, which is taken to be the differentia of the *pramana* knowledge. *Pramana* knowledge must not presuppose a totality in the sense of all-inclusiveness, as the term *sakaladesa* may suggest, but it must be the totality of a system. When we aim at the isolation of one or more aspects from a system (presented as

an object) we get *naya* knowledge; when such isolation is not desired, we get *pramana* knowledge. *Kevalajnana* comprehends the entire system of the universe; the lower and smaller systems are comprehended by other *pramanas*. The totality of a system should not be taken to mean the aggregate of its constituents: an aggregate of partial comprehensions also cannot yield a *pramana*. Rajamalla opposes the view that a *pramana* is an aggregate of the *nayas*. "A *pramana* has a different taste (essence) from the aggregate of *nayas*." "Negation is preceded by affirmation and affirmation by negation. The knowledge which comprehends the union of the two is the *pramana*." Joachim also maintains a similar view. He observes: "To treat science as a sum, aggregate, collection of class of single truths, each of which is what it is in its singleness and remains unchanged in the collection is utterly inadequate as a theory of knowledge." A *pramana* may include the *nayas* but is not identified with them; it always transcends the aggregate of the *nayas*. The totality of the *nayas* gains in essence that which is lost when a partial analysis of a *pramana* is affected. This special essence is suggested by assigning a different taste (*rasa*) to the *pramana*. In these bits of sensuous knowledge, the entity presented to the senses is comprehended as a whole and without isolation, so this type of knowledge is classed with the *pramanas*.

Pramana is mainly of two types:

1. *Direct Perception or Perceptual Cognition (Pratyaksa)*. This is of two types:
 - (a) Sensual perception. Perception made through the senses, directly or through instruments
 - (b) Non-sensual perception. This is of three sub-types:
 - i. Perception through clairvoyance
 - ii. Perception through mind reading
 - iii. Direct perception by soul or perception of Omniscient
2. *Indirect Perception*. This is of three types:
 - (a) Inductive reasoning or Logic or Inference (*Anumaana*). The existence or absence of a thing is decided on the basis of the

existence or absence of another thing, i.e. causality. Many scientific observations, which are the effects of a phenomenon, fall in this category.

- (b) Analogy or Comparison (*Upamana*)
- (c) Scriptures, written records of the teachings of the Omniscient (*Agama*)

10.3.1 Relationship between the *Naya* and *Pramana* Types of Knowledge

If reality is not completely comprehended by the *naya* or by some of the *pramanas*, the question of their validity needs consideration. What kind of validity would the Jaina like to assign to these partial comprehensions? We have seen that the determination of partial comprehensions is also based on something ontologically true in the structure of the objects. The *pramanas* that fail to comprehend reality as a whole must proceed on similar grounds. Both the *nayas* and the *pramanas* yield a valid type of knowledge. "A *naya* comprehension is also valid as it yields a right cognition of its subject-matter." A *naya* is not admitted as an antithesis of a *pramana* because it embodies a type of knowledge. It is a part of the *pramana*. A *naya* is neither a *pramana* nor its antithesis, being free from contradiction. Vidyānanda also establishes a relationship between the *nayas* and *pramanas* by saying that the former are parts of the latter. At the same time, Jainism would like to emphasize that a *pramana* transcends the totality of the *nayas* by gaining a different essence. The *pramana* does not remain the same as it was in isolation. In this sense alone we can say that the *nayas* lose their existence when they enter into a system to yield a *pramana*. A *pramana* is an integrated system of *nayas*; it is a system in which, as Blenshard holds, "integration would be so complete that no part could be seen for what it was without seeing its relation with the whole, and the whole itself could be understood only through the contribution of every part."

Valid and Invalid Knowledge

The knowledge of a soul can be valid or invalid. The knowledge of the Omniscient is *pramana* and is always valid, but that of a non-

omniscient person is *naya type* and can be valid or invalid. The reasons for invalid knowledge can be internal, in the form of a karma veil, or external, consisting of doubtful evidence and supporting means. External factors become important when internal knowledge is not available. In the case of external means of knowledge, *nimitta*, the role of the senses, mind, light, distance, place, time, etc. are important conditions.

There are two reasons for invalid knowledge: (a) spiritual, and (b) physical or practical. The reason for spiritual invalidity is *mithyatva*, wrong perception, on the rise of wrong belief-deluding karma. The reason for practical invalidity is the rise of intelligence-obscuring, *jnanavaraniya*, karma. Spiritual invalidity arises in perverse souls with the rise of wrong belief-deluding karma, but practical invalidity can be present in both *samyakdrishti* souls with right perception as well as in *mithyadriski* souls with wrong perception. *Mithyatva* is the result of the rise of wrong belief-deluding karma and *samyaktva* is the result of the annihilation, suppression or *ksayopashama* of belief-deluding karma. In a *samyakdrishti* soul, belief-deluding karma and the *anantanubandhi* passion karmas have been eliminated.

It is important to distinguish between wrong perception and invalid knowledge, *ajnana*. A soul with wrong or perverse views can have a valid organ of knowledge on the destruction of intelligence-obscuring karma. As wrong perception means doubts and misapprehensions in right perception, invalid knowledge is not doubt or misapprehension of right knowledge: it simply does not perceive right knowledge. Both valid and invalid knowledge are forms of knowledge; they differ only by the souls possessing them. In the spiritual context, the knowledge of a soul with right perception, *samyakdrishti*, is right knowledge and that of a soul with wrong perception, *mithyadriski*, is wrong knowledge. The doubts and apprehensions of *samyakdrishti* are also parts of knowledge and that of *mithyadriski* constitute wrong knowledge. This does not mean that the doubts and misapprehensions of a *samyakdrishti* or their absence in *mithyadriski* form valid knowledge. Doubts and misapprehensions of any soul is always invalid knowledge and their absence is necessary for valid knowledge. Doubts and misapprehensions are caused by the rise of

intelligence-obscuring karma and not by the rise of wrong belief-deluding karma.

Three kinds of ignorance (empirical, articulate, and *vibhanga*) and three kinds of knowledge (empirical, articulate, and *avadhi*) are not misapprehensions. All of these are the results of differences in the levels of destruction of intelligence-obscuring karma. The only difference between them is that in the case of ignorance the soul is *mithyadrsti* and in the case of knowledge the soul is *samyagdrsti*.

A mixed-perception soul, *misradrsti*, is doubtful about the truth; a soul with perverse perception, *mithyadrsti*, perceives the wrong truth. The former does not perceive wrong truth, but is only doubtful. Despite having valid knowledge, a *mithyadrsti* soul cannot be called *samyagdrsti* because of the rise of wrong belief-deluding karma.

A soul with a higher level of annihilation of intelligence-obscuring karma is assumed to be a scholar, learned person, scientist, etc. When he or she is also an authority on his or her subject and is free from doubts and misapprehensions, he or she can have valid knowledge of the *naya* type when the factors of practical invalidity are absent. It does not matter whether such a person is *mithyadrsti*, which may be the case in respect to most scholars and scientists, particularly in the West today, or *samyagdrsti*. If he or she is *samyagdrsti*, his or her knowledge is based on right perception and is also valid. Such individuals work for the pursuit of knowledge in the general interest, leaving behind self-interest. They become saints in spirit and use their knowledge for the welfare of society and for the well-being of this planet.

There is a continuing debate about the role of *buddhi*, intellect, and *bhavana*, perception of reality. A *mithyadrsti* can be intelligent and possess valid knowledge, but there is no assurance that his or her *bhavana* is pure, so he or she may misuse his or her knowledge. A *samyagdrsti* has pure *bhavana*, so his or her knowledge, even when imperfect, is closer to the truth and describes reality with fewer chances of contradiction.

In summary, we recall that there are two types of valid knowledge: (a) direct knowledge that perceives the object without any medium; and (2) indirect knowledge that perceives the object with the help of a

medium. The direct knowledge of the Omniscient is true and valid. The knowledge of a soul with psychical karma has been divided into two types, direct and indirect. Indirect knowledge is further divided as follows:

1. Empirical (*Mati*) knowledge
 - (a) Valid knowledge
 - (i) Sensual, direct knowledge
 - (ii) Indirect knowledge as memory, power of identification, logic and speculation
 - (b) Invalid knowledge
2. Articulate (*Sruti*) knowledge
 - (a) Valid knowledge
 - (i) Scriptural knowledge
 - (ii) Knowledge received through words of an authority
 - (b) Invalid knowledge

10.4 Intelligence Standards

Here, I briefly review the views of modern scholars on intelligence standards.

10.4.1 Intelligence Quotient

An Intelligence Quotient, or IQ, is a score derived from one of several [standardized tests](#) designed to assess intelligence. "IQ scores have been shown to be associated with such factors as morbidity and mortality, parental social status, and, to a substantial degree, biological parental IQ." IQ scores are used as predictors of [educational](#) achievement or [special needs](#). Although IQ attempts to measure some notion of intelligence, it may fail to act as an accurate measure of "intelligence" in its broadest sense. IQ tests only examine particular areas embodied by the broadest notion of "intelligence," failing to account for certain areas which are also associated with "intelligence" such as [creativity](#) or [emotional intelligence](#). Critics argue that to base a concept of intelligence on IQ test scores alone is to ignore many important aspects of mental ability. Some scientists dispute IQ

entirely. Some psychologists are also persistent critics of IQ, calling it "the IQ myth."

10.4.2 Emotional Intelligence

Emotional Intelligence (EI) is the ability to identify, assess, and control the [emotions](#) of oneself, of others, and of groups. It can be divided into ability EI and trait EI. Criticisms have centered on whether EI is a real [intelligence](#) and whether it has incremental validity over [IQ](#) and the [Big Five personality traits](#). Substantial disagreement exists regarding the definition of EI with respect to both terminology and operationalization. Currently, there are three main models of EI:

1. Ability model
2. Mixed model (usually subsumed under trait EI)
3. Trait model

Ability model

“The ability-based model views emotions as useful sources of information that help one to make sense of and navigate the social environment. The model proposes that individuals vary in their ability to process information of an emotional nature and in their ability to relate emotional processing to wider cognition. This ability is seen to manifest itself in certain adaptive behaviors. The model claims that EI includes four types of abilities:

1. Perceiving emotions – the ability to detect and decipher emotions in faces, pictures, voices, and cultural artifacts—including the ability to identify one's own emotions. Perceiving emotions represents a basic aspect of emotional intelligence, as it makes all other processing of emotional information possible.
2. Using emotions – the ability to harness emotions to facilitate various cognitive activities, such as thinking and problem solving. The emotionally intelligent person can capitalize fully upon his or her changing moods in order to best fit the task at hand.
3. Understanding emotions – the ability to comprehend emotion language and to appreciate complicated relationships among

emotions. For example, understanding emotions encompasses the ability to be sensitive to slight variations between emotions, and the ability to recognize and describe how emotions evolve over time.

4. Managing emotions – the ability to regulate emotions in both ourselves and in others. Therefore, the emotionally intelligent person can harness emotions, even negative ones, and manage them to achieve intended goals.

The ability EI model has been criticized in the research for lacking face and predictive validity in the workplace.”

Mixed model

“The model introduced by Daniel Goleman focuses on EI as a wide array of competencies and skills that drive leadership performance. Goleman's model outlines five main EI constructs

1. Self-awareness – the ability to know one's emotions, strengths, weaknesses, drives, values and goals and recognize their impact on others while using gut feelings to guide decisions.
2. Self-regulation – involves controlling or redirecting one's disruptive emotions and impulses and adapting to changing circumstances.
3. Social skill – managing relationships to move people in the desired direction
4. Empathy - considering other people's feelings especially when making decisions
5. Motivation - being driven to achieve for the sake of achievement.”

Goleman's model of EI has been criticized in the research literature as mere "pop psychology."

Trait model

“In lay terms, trait EI refers to an individual's self-perception of their emotional abilities. This definition of EI encompasses behavioral dispositions and self-perceived abilities and is measured by [self report](#), as opposed to the ability-based model which refers to actual abilities, which have proven highly resistant to scientific measurement.” “The trait EI

model is general and subsumes the Goleman model discussed above. The conceptualization of EI as a personality trait leads to a construct that lies outside the [taxonomy](#) of human cognitive ability. This is an important distinction in as much as it bears directly on the operationalization of the construct and the theories and hypotheses that are formulated about it.”

“Locke claims that the concept of EI is in itself a misinterpretation of the intelligence construct. He suggests the concept should be re-labeled and referred to as a skill.”

10.4.3 Spiritual Intelligence

“**Spiritual Intelligence** is a term used by some [philosophers](#), [psychologists](#), and developmental theorists to indicate spiritual parallels with [Intelligence Quotient](#) and [Emotional Quotient](#) (EQ).

[Howard Gardner](#), the originator of the theory of [multiple intelligences](#), chose not to include spiritual intelligence amongst his "intelligences" due to the challenge of codifying quantifiable scientific criteria. Instead, Gardner suggested an "existential intelligence" as viable. However, contemporary researchers continue to explore the viability of Spiritual Intelligence (often abbreviated as "SQ") and to create tools for measuring and developing it. So far, measurement of spiritual intelligence has tended to rely on self-assessment instruments, which some claim can be susceptible to false reporting.”

“Robert Emmons defines spiritual intelligence as "the adaptive use of spiritual information to facilitate everyday problem solving and goal attainment." He originally proposed 5 components of spiritual intelligence:

1. The capacity to transcend the physical and material.
2. The ability to experience heightened states of consciousness.
3. The ability to sanctify everyday experience.
4. The ability to utilize spiritual resources to solve problems.
5. The capacity to be virtuous.

The fifth capacity was later removed due to its focus on human behavior rather than ability, thereby not meeting previously established scientific criteria for intelligence. Frances Vaughan offers the following

description: "Spiritual intelligence is concerned with the inner life of mind and spirit and its relationship to being in the world." Cindy Wigglesworth defines spiritual intelligence as "the ability to act with wisdom and compassion, while maintaining inner and outer peace, regardless of the circumstances." She breaks down the competencies that comprise SQ into 21 skills, arranged into a four quadrant model similar to Daniel Goleman's widely used model of emotional intelligence or EQ. The four quadrants of spiritual intelligence are defined as:

1. Higher Self / Ego self Awareness
2. Universal Awareness
3. Higher Self / Ego self Mastery
4. Spiritual Presence / Social Mastery”

“David B. King defines spiritual intelligence as a set of adaptive mental capacities based on non-material and transcendent aspects of reality, specifically those that:”...contribute to the awareness, integration, and adaptive application of the nonmaterial and transcendent aspects of one's existence, leading to such outcomes as deep existential reflection, enhancement of meaning, recognition of a transcendent self, and mastery of spiritual states." King further proposes four core abilities or capacities of spiritual intelligence:

1. **Critical existential thinking:** The capacity to critically contemplate the nature of existence, reality, the universe, space, time, and other existential/metaphysical issues; also the capacity to contemplate non-existential issues in relation to one's existence (i.e., from an existential perspective).
2. **Personal meaning production:** The ability to derive personal meaning and purpose from all physical and mental experiences, including the capacity to create and master a life purpose.
3. **Transcendental awareness:** The capacity to identify transcendent dimensions/patterns of the self (i.e., a transpersonal or transcendent self), of others, and of the physical world (e.g., non-materialism) during normal states of consciousness, accompanied by the capacity to identify their relationship to one's self and to the physical.

4. **Conscious state expansion:** The ability to enter and exit higher states of consciousness (e.g. pure consciousness, cosmic consciousness, unity, oneness) and other states of trance at one's own discretion (as in deep contemplation, meditation, prayer, etc.).”

Vineeth V. Kumar and Manju Mehta have also researched the concept extensively. Operationalizing the construct, they defined spiritual intelligence as "the capacity of an individual to possess a socially relevant purpose in life by understanding 'self' and having a high degree of conscience, compassion and commitment to human values.”

10.5 Jain View of Intelligence

In Jain philosophy the qualities and traits of a worldly soul are determinable in terms of karma. All processes, actions, behavior, and performances of a worldly soul can be explained by processes taking place in the karma body and the soul. We defined two types of intelligence in Chapter 5:

1. Psychical intelligence – manifested by the destruction, suppression or destruction-cum-suppression of psychical (*ghatin*) karma
2. Biological intelligence – manifested by the rise of biological (*aghatin*) karma.

The manifestation of biological intelligence produces hardware in the form of the body and is a deciding factor in determining one's activities. The body is self-sufficient and has a local information system, in the form of the genetic code, for its operation. The manifestation of psychical intelligence provides the application software that makes use of the body hardware. *Ksayopashama* of deluding karma generates the need for applications, and *ksayopashama* of intelligence-obscuring karma provides the intelligence for the design and operation of the application software. *Ksayopashama* of awareness-obscuring karma helps the intelligence in this task. This software is not essential for the operation of the body, which can function without it as happens in the omniscient state. For a given body, it is the power and capacity of the application software that produces the results. High results are obtained

by powerful software generated on the high *ksayopashama* (etc.) of psychical karma; low results are obtained by weak software generated on the low *ksayopashama* of psychical karma. The performance of the soul in a given mode is a function of the states of both the hardware and the software. The hardware in general is characterized by the number of senses and the presence or absence of the mind; the greater the number of senses, the better the hardware. In the human mode, the performance of the soul has the widest range, from the first *gunasthana* to fourteenth *gunasthana* depending upon the *ksayopashama* level of the psychical karma. When the hardware function is limited due to age or injury, or when the software is impaired on the rise of psychical karma, the performance of the living system is adversely affected.

Both types of intelligence work jointly to determine the overall performance of the soul. For example, an intelligent soul must have a good mind and a healthy brain. Referring to Chapter 4, higher intelligence may be manifested by greater destruction-cum-suppression of intelligence-obscuring karma. Higher J_1 may mean a better faculty of creative intelligence and higher J_2 may result in better rational intelligence. This must be accompanied by the rise of the appropriate body-making karma and status-determining karma to ensure a healthy and well-functioning brain. It is envisaged that when the soul is performing creatively and rationally merit karma is also on rise, i.e. the meritorious performance of the soul needs the rise of merit karma. The rise of demerit karma produces negative results.

Intelligence does not necessarily imply auspicious activities of the soul. Intelligence can be applied to both auspicious and inauspicious activities. This is decided by deluding karma. A higher level of destruction-cum-suppression of deluding karma promises auspicious actions. The manifested intelligence (or IQ) is a complex process involving karma of various types, but in general a higher intelligence can be attributed to a higher destruction-cum-suppression level of intelligence-obscuring karma.

What is wisdom and how is it related to intelligence? Wisdom is normally described as the ability to make good decisions, which may not necessarily be intelligent. I defined the term *buddhi* in Chapter 4 and

showed that it consists of the qualities of intelligence and perception of the soul. The important point is that a wise person must have a clear perception of the self as well as of the environment so that he or she makes the right decision using whatever intelligence he/she has. A wise person may not always be very intelligent, and a very intelligent person may not be wise. Wisdom is a quality primarily related to the perception of events and the making of decisions that have a low possibility of conflict.

Emotional intelligence is not described in Jain philosophy. Jainism describes the passions (*kashayas*) and emotions (*nokashayas*) as the most detrimental impurities of the soul and suggests ways and means to reduce and ultimately eliminate them, leading to purer states of the soul. Jain philosophy emphasizes the control over the passions and emotions and does not refer to developing skills to use them for some worldly purpose in life. In the spiritual context passions and emotions are not considered useful traits and the utmost importance is given to removing them for peace and happiness in life. In this respect, emotional intelligence is rather an antithesis of intelligence and is considered an undesirable trait.

Spiritual intelligence is an important concept, but Jain philosophy does not describe it as intelligence – rather, it is a power of the soul that is manifested on attaining states of higher purity. These states are described by *Gunasthanas*. A higher *Gunasthana* with a smaller amount of passions and emotions represents higher purity of the soul. That is, as passions and emotions reduce the spiritual power of the soul increases. This, in a way, can also be called intelligence, as the soul in a higher *Gunasthana* becomes wise so as not to let passions and emotions bond again. No importance is given to the use of this spiritual power in accomplishing worldly objectives, which in fact run contrary to the very purpose of the spiritual life. The soul is expected to renounce worldly objectives as it ascends *Gunasthanas* with the ultimate goal of emancipation, getting rid of this worldly existence. On the complete elimination of passions and emotions, the soul becomes omniscient and has infinite intelligence, transcending the need for worldly affairs that are the source of the impurity of the soul. In this respect, Jain philosophy advocates attaining states of higher spiritual intelligence, reaching the

peak in the thirteenth *Gunasthana*, the state of omniscience. Spirituality is the core principle of Jain philosophy and is considered to be the right path in life. Worldly activities are for the sustenance of life and should only be given importance to the extent that they do not interfere with spiritual progress.

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11

Is Consciousness a Quantum Phenomenon?

11.1 Introduction

Quantum mechanics is a more fundamental theory than Newtonian mechanics and classical electromagnetism, in the sense that it provides accurate and precise descriptions for many phenomena these "classical" theories simply cannot explain on the atomic and subatomic level. Quantum mechanics was initially developed to explain the atom, especially the spectra of light emitted by different atomic species. The quantum theory of the atom was developed as an explanation for the electron staying in its orbit, which could not be explained by Newton's

laws of motion or by classical electromagnetism. In quantum mechanics, the point-like particle is replaced by a wave function – a smeared out, cloud-like structure, assigning a probability to each space-time point that the electron could occupy.

Quantum theory tells us that “particles” are actually interactions between fields. When two fields interact with each other, they do so instantaneously and at one single point in space. These interactions and localized interactions are “particles.” Quantum Field Theory merges quantum mechanics and relativity, albeit in a limited way. It is an *ad hoc* but successful physical theory premised on the assumption that physical reality is essentially non-substantial and fields alone is real. Fields, and not particles, is the substances of the universe.

Quantum mechanics identifies the silent, or unexpressed phase of matter (the wave function), the dynamic or expressed phase of matter (the classical particle), and also the relationship between them. As elaborated in quantum measurement theory, it is the phenomenon of attention that causes the unmanifested to manifest. This “collapse of the wave function” was thought by some to be brought about by the act of observation itself. The mathematician John von Neumann said that consciousness is a factor in deciding the quantum measurement. Eugene Wigner supported this idea; both looked upon consciousness as part of the mind, and believed that consciousness collapsed the quantum wave function. However, recent experiments have determined that this phenomenon does not require any human observer, but will take place spontaneously in order to preserve order in the universe.

“Albert Einstein, and with him Louis De Broglie and later David Bohm, believed that quantum mechanics was incomplete, that the wave function was only a statistical description of a deeper structure which was deterministic. Einstein saw quantum mechanics as analogous to a statistical device and the wave function as just a peculiar statistical device for observers who are ignorant of the values of the hidden variables underneath.”

According to Martin Flechl, the interpretations mainly differ in the answer to two questions:

- A. Does the wave function represent (1) anything real (A_1) or (2) just a symbol in equations (A_2)?
- B. What kind of interaction causes the collapse of the wave function (1) any contact interaction (B_1), or (2) only a consciousness – like interaction (B_2).

The Copenhagen Interpretation concludes that, since interaction changes the way a system evolves and since each measurement constitutes an interaction between the measurement device and the measured system, the specific experimental set-up influences the outcome of a measurement and is therefore part of the measurement itself. Nature is divided into two parts: The observed system and the measurement device used.

So far the Copenhagen Interpretation is compatible with all four combinations of answers to the questions A and B. Interestingly, Bohr, Heisenberg and Bohm were advocating A_2 (statistical interpretation of the wave function) and B_1 , while Stapp, who claims to agree with the Copenhagen Interpretation, clearly is in favour of B_2 and rather A_1 , although he is not explicit regarding this question.

Although quantum physics is not necessary to account for indeterminism in nature, it does accurately explain the behavior of particles in the microscopic world.

Holism and non-locality are features of the quantum world with no precise classical equivalents. The former implies that interacting systems have to be considered as wholes – you cannot deal with one part in isolation from the rest. Non-locality means, among other things, that spatial separation between its parts does not alter the requirement to deal with an interacting system holistically.

The original motivation in the early 20th century for relating quantum theory to consciousness was essentially philosophical. It is fairly plausible that conscious free decision (free will) is problematic in a perfectly deterministic world, so quantum randomness might indeed open up novel possibilities for free will. (On the other hand, randomness is problematic for volition!)

The quantum mind or quantum consciousness hypothesis proposes that classical mechanism cannot explain consciousness (it must be noted that consciousness is as an emergent property in these scientific discussions in some way); the apparently chaotic or quantum behavior associated with neural networks cannot be accommodated by classical physics. While quantum mechanical phenomena, such as quantum entanglement and superposition, may play an important part in the brain's functions, it could form the basis of an explanation of consciousness. Quantum theory has however been intriguing for scientists who are eager to provide a physical explanation of consciousness.

Loosely speaking, the point is that consciousness is unlikely to arise from classical properties of matter, which are well known and testable. But quantum theory allows for a new concept of matter altogether for something that is not purely material or purely extra-material. The danger in this way of thinking is to relate consciousness and quantum phenomena only because they are both poorly understood: both are mysterious and unattainable.

Another quantum phenomenon of interest in consciousness studies is the Bose-Einstein Condensate (BEC). A BEC is a state of matter that occurs in certain gases at very low temperatures. As the temperature drops, each atom's wave grows, until the waves of all the atoms begin to overlap and eventually merge. After they merge, the atoms are located within the same region in space, they travel at the same speed, and they vibrate at the same frequency: they become indistinguishable. In BEC, many parts of a system not only behave as a whole, they become a whole. Their identities merge in such a way that they lose their individuality. Each particle in a BEC fills all the space and all the time in whatever container holds the condensate. Many of their characteristics are correlated. They behave holistically as one. The condensate acts as one single particle. There is no "noise" or interference between separate parts. This is why super fluids and superconductors have their special frictionless qualities and lasers become so coherent. Superconductors, super fluids and lasers are BEC, but this happens at a very low temperature or in very high energy systems.

“Herbert Frolich argues that BEC is achievable in biological organisms at body temperatures. He found quantum coherence in body cells at body temperature where biological dipole oscillators, such as dielectric protein molecules, vibrate under the influence of an electrical short range force between the poles of a single oscillator and the coulomb forces between oscillators. Prior to that, quantum physicist Fritz Popp discovered that biological tissue emits a weak glow when stimulated at the right energy levels. Cell walls of biological tissue contain countless proteins and fat molecules which are electrical dipoles. When a cell is at rest these dipoles are out of phase and arrange themselves in a haphazard way. But when they are stimulated they begin to oscillate or jiggle intensely and broadcast a tiny microwave signal. Frolich found that when the energy flowing through the cell reaches a certain critical level, all the cell wall molecular dipoles line up and come into phase. They oscillate in unison as though they are suddenly coordinated. This emergent quantum field is a BEC and has holistic properties common to any quantum field.”

Quantum mechanical phenomena such as the Bose-condensation interference within the nervous system have been proposed by several physicists. Coordination of the indeterminacies within a neural network on many neurons is a quantum phenomenon associated with Bose condensation. However appealing such a model might be, it is only one facet of our understanding. Chris Clarke in his essay “Quantum Mechanics, Consciousness and the Self,” states that “physics will be just one contributor to a growing understanding that draws on all facets of our knowing and being.”

“The similarities between computer circuits and brain cells have driven brain researchers to construct computer models for the brain. However, computer models are many orders of magnitude lower than needed to account for the speed of human beings. A neurobiologist has calculated that if the brain was a standard serial or a parallel computer it would take more than the age of the universe to perform all the necessary calculations associated with just one perceptual event. But if the brain were a quantum computer, it would try out all the various possible

combinations of data arrangement at once and thus unify its experience.” “It has also been pointed out that anything that is infallible cannot be intelligent; a computer, being infallible, cannot be intelligent. A computer model of the brain cannot explain the distinctive indivisibility of our thoughts, perceptions and feelings.”

All (emergent) theories of consciousness is highly speculative, and in general only their self-consistency and their consistency with other theories (in particular quantum theories which have been tested to the highest precision) can currently be tested. We are talking of possible solutions – without disrespect, since even in centuries no consistent and satisfactory concept of consciousness has been evolved in science.

11.2 Quantum Approaches to Consciousness

The Stanford Encyclopedia of Philosophy surveyed some popular approaches for applying quantum theory to consciousness. Variants of the dichotomy between mind and matter range from their fundamental distinction at a primordial level of description to the emergence of mind (consciousness) from the brain as an extremely sophisticated and highly developed material system.

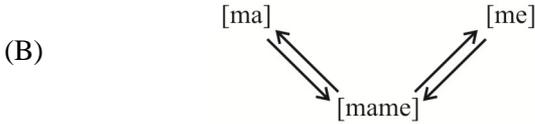
According to the Stanford group, in most approaches material (ma) brain states are considered to be directly related to mental (me) states of consciousness, the direct way (A),

$$(A) \quad [ma] \longleftrightarrow [me]$$

This point of view claims that it is both necessary and sufficient to explore and understand the material domain, e.g., the brain, in order to understand the mental domain, e.g., cognition and consciousness.

“The most discussed counterarguments emphasize the impossibility for material accounts to properly incorporate the quality of the subjective experience of a mental state. Nagel asked “what it is like” to be in that state. This leads to a gap between third-person and first-person accounts for which David Chalmers has coined the notion of the hard problem of consciousness.”

“As an alternative to (A), it is possible to conceive mind-matter relations indirectly (B):



Here denoted [mame], is often regarded as being neutral with respect to the distinction between [ma] and [me], i.e., psychophysically neutral.” Scenario (B) depicts the “dual aspect” option of reality.

Following the Stanford approach, I will now briefly review the major theories of quantum consciousness.

11.2.1 First Category Approach

“This category, belonging to scheme (A), refers to the discussion of quantum theory in relation to consciousness that adopts basic ideas of quantum theory in a purely metaphoric way. Quantum theoretical features such as randomness, entanglement, superposition, collapse, complementarity, and others are used without specific reference to how they are precisely defined and how they are applicable to specific situations. For instance, conscious acts are postulated to be somehow interpretable analogously to physical acts of measurement, or correlations in psychological systems are postulated to be somehow interpretable analogously to physical entanglement. Such accounts may be important to inspire new ideas to be worked in detail but are otherwise considered fascinating science fiction.”

11.2.2 Second Category Approach

The second category, also falling in scheme (A), includes approaches that use the status quo of present-day quantum theory to describe neurophysiological and/or neuropsychological processes. The early approaches of von Neumann and Wigner mentioned above fall in this category. “The first detailed quantum model of consciousness was probably the American physicist Evan Walker’s synaptic tunneling model in which electrons can “tunnel” between adjacent neurons, thereby creating a virtual network overlapping the real one. It is this virtual nervous system that produces consciousness and that can direct the behavior of real nervous system. The real nervous system operates by means of synaptic messages; the virtual one operates by means of the

quantum effect of tunneling. The real one is driven by classical laws, the virtual one by quantum laws. Consciousness is therefore driven by quantum laws; brain's behavior is described by classical laws."

In 1989 British psychiatrist Ian Marshall showed similarity between the holistic properties of BEC and those of consciousness and suggested that consciousness may arise from the excitation of such BEC.

I briefly discuss the important more recent approaches here.

Stapp

American physicist Henry Stapp proposed a quantum theory of consciousness based on Heisenberg's interpretation of QM, that reality is a sequence of collapses of wave functions, i.e. of quantum discontinuities. He observes that this view is similar to William James's view of the mental life as "experienced sense object." Using von Neumann's approach he remarked that "the state of the universe is represented by a wave function which is a compendium of all the wave functions that each of us can cause to collapse with her or his observations. That is, the state of the universe is an objective compendium of subjective knowing."

Stapp's interpretation of quantum theory is that there are many knowers. Each knower's act of knowledge results in a new state of the universe. Quantum theory is not about the behavior of matter, but about our knowledge of such behavior. "Thinking" is a sequence of events of knowing. The physical aspect of nature is a compendium of subjective knowledge. The conscious act of asking a question is what drives the actual transition from one state to another, i.e. the evolution of the universe. The universe is a repository of knowledge, that we have access to and upon which our consciousness has control.

Stapp claims that von Neumann extended the Copenhagen Interpretation by replacing the observer-observed system separation with a separation into a physically described part, consisting of the system to be measured, the measurement device, as well as the brain and body of the observer, and a psychologically described part, the consciousness of the observer. The link between both parts is then the brain of the observer, which is being acted upon by the consciousness of the

observer. It is our consciousness that collapses the physical state of a system. According to this interpretation, the universe (and each part of it) is only in a well-defined state when we observe it. This has strange consequences; such as if no one looks at the moon for some time the moon would finally spread out into the entire universe. Conscious beings can therefore influence the physical world by asking questions about its nature and by specifying possible answers. Note that collapse is also possible without the presence of a conscious agent.

Stapp sees collapse as a mental process and the deterministic evaluation of brain states as physical. The process by which collapse selects an actuality from a set of possibilities is seen a process of choice, and not merely a random dice-throw. Stapp envisages consciousness as exercising top-level control over neural exercising in the brain. Quantum brain events are suggested to occur at the whole brain level, and are seen as being selected from the large- scale excitation of the brain. The neural excitations are viewed as a code, and each conscious experience as a selection from this code. The brain, in this theory, is proposed to be a self-programming computer with a self sustaining input from memory, which is itself a code derived from previous experience. This process is suggested to result in a number of probabilities from which consciousness has to select. The conscious act is a selection of a piece of top-level code, which then exercises ongoing control over the flow of neural excitation. Stapp thinks that this process refers to the top level of brain activity involved with information gathering, planning and the monitoring of the execution of plans. Conscious events are, in this theory, proposed to be capable of grasping a whole pattern of activity, thus accounting for the unity of consciousness, and providing a solution to the “binding problem.”

Stapp follows the logical consequences of this approach and achieves a new form of idealism: all that exists is that subjective knowledge, therefore the universe is not about matter, it is about subjective experience. Quantum theory does not talk about matter; it talks about our perceiving matter. Stapp rediscovers George Berkeley’s idealism: we are only our perceptions (observations).

Quantum Brain Dynamics (QBD)

“In QBD, the electrical dipoles of the water molecules that constitute 70% of the brain are proposed to constitute a quantum field, known as the cortical field. The quanta of this field are described as corticons. In the theory, this field interacts with quantum coherent waves generated by biomolecules in the neurons and propagating along the neural network.” Frohlich is the source of this idea that quantum coherent waves could be generated in the neuronal network.

The proponents of QBD differ somewhat as to the exact way in which it produces consciousness. Riccardi and Umezawa suggested utilizing the formalism of quantum field theory to describe the brain states, with particular emphasis on memory. The basic idea is to conceive of memory states in terms of states of many-particle systems, as in equivalent representations of vacuum states of quantum fields. Jibu and Yasue show how consciousness could arise from interaction between the electromagnetic field and molecular fields of water and protein. Jibu and Yasue explain how the classical world can originate from quantum processes in the brain. They think that several layers of the brain can host quantum processes, whose quantum properties explain consciousness and cognition. They focus on structures such as microtubules which lie inside the neuron, and which contain quasi-crystalline water molecules that again lend themselves to quantum effects. The function of this quantum field could be cognitive: some particular quantum states could record memory. Viitiello thinks that the quantum states involved in QBD produce two poles, a subjective representation of the external world and a self. This self opens itself to the representation of the external world. Consciousness is, in this theory, not in either the self or the external representation, but between the two in the opening of one to the other.

The majority of presentations of this approach do not consistently distinguish between mental states and material states. This suggests the reducibility of mental activity to brain activity, within scenario (A), as an underlying assumption. However, the QBD approach avoids the restrictions of standard quantum mechanics in a formally sound way.

Danah Zohar

“Physicists at Weizmann Institute in Israel have done a variation of the “double-slit” experiment; they used electrons, instead of photons, and

observed how the resultant influence pattern (which indicates wave- like properties of the particle) dissipated the longer you watched the electrons go through the slits. As a wave the electron passes through both slits simultaneously but if it “senses” that it is being watched, the electron (as a particle) goes through only one path, diminishing the interference pattern. Elementary particles (such as photons and electrons) appear to possess a certain degree of “intelligence” and awareness of the environment.”

This is assumed to mean that consciousness appears to be as fundamental a property to elementary particles as properties that make it “matter” or a “physical force” (for example, mass, spin and charge). This is more evident in BEC which behave as super particles. However, low energy and low frequency elementary particles easily lose their property of consciousness when they become entangled with other particles and decoherence sets in. This state is analogous to the state of a demagnetized metal object. Like magnetization, when groups of particles are in the same quantum state, i.e. when they are in a state of quantum coherence, the property of consciousness is exhibited. A state of an extremely low degree of consciousness is exhibited by inanimate matter at macroscopic scales in highly decoherent low-energy classical universe. This means that bulk matter in a non-coherent state is effectively unconscious.

“Quantum physicist Danah Zohar of the above group describes consciousness as something that includes general capacity for awareness and purposive response. Roger Penrose refers to these as passive consciousness and active consciousness. When a person is awake the information about his/her surroundings is presented to his/her brain by his/her sense organs. The brain processes and computes millions of bits of information presented to it every second by the sensory organs and present the processed information to consciousness.”

“Danah Zohar points out that ion channel oscillations in neurons are quantum phenomena which generate a Frolich-like coherent electric field. There are ion channels (protein molecules) lining the membrane walls of individual neurons, which open or close in response to electrical fluctuations resulting from stimulation. They act like gates to let Sodium,

Potassium and other ions through. They are of a size to be subject to quantum fluctuations and superposition. Each channel as it oscillates generates a tiny electric field. When a large number of ion channels (there are 10 million in each neuron) open and close in unison, as they do when stimulated, the whole neuron fires or oscillates and a large scale electric field is generated across the neuron, certain neurons act as pace makers. When a pacemaker neuron oscillates in response to stimulation, bundles of neurons oscillate with it, a finding by a neurobiologist that when a person sees an object all neurons in the cerebral cortex, associated with that perceptual object, oscillates in unison regardless of their location in the brain.” This explains how a large number of disparate and distant neurons can integrate their information to produce a holistic picture.

BEC “creates a unity from the diverse bits of information drawing them to a meaningful whole. The millions of sensory data from sense organs received every moment are channeled to various disparate areas of the brain and processed by the computing facility of the brain. Consciousness receives this processed information through and creates a holistic scene. It is this integration of all the processed bits of information to create a one whole that creates the identity as a person, the self or the “I” ness.” Danah Zohar concludes that consciousness functions according to the laws of quantum mechanics.

It has been found that when a stimulus is presented to a sensory organ of an anaesthetized person all brain process relevant to that stimulus takes place as if he/she is not anaesthetized. None has yet pointed to a single event that occurs in awake but not in anesthetized brain. When a hypnotherapist suggests, for example, that he/she is seeing red light to a hypnotized subject, all above processes take place in the brain as if the subject is actually seeing red light.

Beck and Eccles

Beck and Sir John Eccles think that mind or consciousness is separate from the brain, consciousness must first be there before the neurological events begin. Therefore, the mind controls matter rather than matter (the brain) controlling the mind. Eccles points out that the scope of consciousness may not remain limited within the confines of the

human skull, because consciousness at times can remain completely disembodied. Beck states explicitly that “science cannot, by its very nature, present any answer to questions related to mind.

Sir Karl Popper describes the mind and brain exists in two separate realities. The brain is a functioning material organ of the body, and the mind or consciousness is the immaterial symptom of the living entity or soul which motivates the body.

11.2.3 Third Category Approach

The third category refers to further developments or generalizations of present-day quantum theory.

Penrose and Hameroff

In the approach presented by Penrose and Hameroff, quantum theory is claimed to be effective for consciousness, but this happens in an extremely sophisticated way. It is argued that elementary acts of consciousness are non-algorithmic, i.e., non-computable, and they are neurophysiologically realized as gravitation-induced reductions of coherent superposition states in microtubule. Roger Penrose thinks that consciousness must be quantum phenomenon because neurons are too big to account for consciousness. In general, the collapse of the wave function is what gives the laws of nature a non-algorithmic element. Otherwise we would simply be machines and we would have no consciousness.

Microtubules are the main component of a supportive structure within neurons, known as the cytoskeleton. They are composed of tubulin protein dimer subunits. Tubulins have other smaller non-polar regions that contain pi-electron – rich indole rings, and Hameroff claims that these electrons are close enough to become quantum entangled. These electrons could become locked in phase, forming BEC. These BEC could extend to many others, Thus forming a macroscopic quantum feature across an extended area of the brain. When the wave function of this extended condensate collapsed, it could give access to non-computational influence related to mathematical understanding and ultimately conscious experience.

Hameroff further postulated that the activity of these condensates is the sources of gamma wave synchronization in the brain that has been viewed as a likely correlate of consciousness in conventional neuroscience.

Hameroff has pointed out that single cell organisms such as “paramecium” can perform quite complicated actions normally thought to need a brain. He suggests that their “brain” is in their microtubules (see BEC). Shape changes in the constituent proteins (tubulin) could sub serve computational functions and would involve quantum phenomena of the sort envisaged by del Guidice et al. This raises the intriguing possibility that the most basic cognitive unit is provided, not by the nerve cell synapse as is usually supposed, but by the microtubular structure within cells. The underlying intuition is that the structures formed by BEC are the building blocks of mental life; in relation to perception they are model of the world, transforming a nice view, say, into a mental structure which represents some of the inherent qualities of that view.

By and large, the ideas of Penrose and Hameroff represent a highly speculative approach with conceptual problems and without plausible concrete ideas for empirical confirmation. Jeffrey Reimers showed that coherent Frolich condensates, basis of Hameroff’s postulate, could not exist in biological tissue.

11.2.4 Mind and Matter as Dual Aspects

Bohm and Hiley

Several decades ago David Bohm pointed out many striking similarities between the behavior of our thought processes and that of some quantum processes. For example while entertaining a vague train of thought, the act of concentrating on one in order to bring it into better focus, changes the original sequence. Like electrons governed by Heisenberg’s, uncertainty principle, which are never the same again once they have been looked at or measured, a thought which has been highlighted through attention is different from the vague musing which preceded it. The focused thoughts have “position” like the particle aspect of an electrons’ two sided nature, whereas the vague musing has

“momentum” like the electron’s wave aspect. We can never experience both simultaneously. This is a characteristic feature of a quantum entity.

Quantum systems are essentially unified, so are our thought processes. Thought processes and quantum systems are analogues in that they cannot be analyzed too much in terms of distinct elements, because the “intrinsic” nature of each element is not a property existing separately from and independently of other elements but is instead a property that arises partially from its relation with other elements.

Bohm’s implicate order applies both to matter and consciousness, and he proposed that it could explain the relationship between them. Mind and matter are here seen as projections into our explicate order from the underlying reality of the implicate order. Bohm claims that when we look at the matter in space, we can see nothing in these concepts that helps us to understand consciousness. Gustav Bernroider thinks that Bohm’s implicate – explicate structure can account for the relationship between neural processes and consciousness.

In the latter approach, Bohm and Hiley, the notions of implicate and explicate order mirror the distinction between ontic and epistemic domains. At the level of implicate order, the term active information expresses that this level is capable of “informing” the epistemically distinguished, explicit domains of mind and matter. While the proposal by Bohm and Hiley essentially sketches conceptual framework without further details, the suggestions by Pauli and Jung consider the distinction between epistemic and ontic domains of material reality due to quantum theory in parallel with the distinction between epistemic and ontic mental domains.

David Bohm took the view that quantum theory and relativity contradicted one another, and that this contradiction implied that there existed a more fundamental level in the physical universe. This more fundamental level was supposed to represent an undivided wholeness and an implicate order, from which arose the explicate order of the universe as we experience it.

Recently, Primas has proposed a dual-aspect approach where the distinction of mental and material domains originates from the

distinction between two different modes of time: tensed (mental) time, including nowness, on the one hand and tenseless (physical) time, viewed as an external parameter, on the other. Primas conceives the tensed time of the mental domain as quantum correlated with the parameter time of physics via “time-entanglement,” though it is still a tentative scheme without concrete indications of how to test it empirically.

David Chalmers

American Philosopher David Chalmers argues that consciousness cannot be explained with a reductionist approach, because it does not belong to the realm of matter. Chalmers distinguishes between a phenomenal concept of mind (the way it feels) and a psychological concept of mind (the way it does). Every mental property is either a phenomenal property, a psychological one or a combination of the two. The mind-body problem is therefore made of two parts, one that deals with the mental faculties, referring to phenomenal consciousness, and one that deals with how/why those mental faculties give rise to awareness of them, referring to psychological consciousness.

Chalmers’s dualism is different from Descartes in that it claims that “consciousness is a feature of the world” which is somehow related to its physical properties. It follows from his theory that consciousness is due to the functional organization of the brain. It also follows that anything having the proper functional organization can have consciousness; regardless of the material it is made of. From this view, everything in the universe may have consciousness, at least to some degree.

Chalmers notes:

“Nevertheless, quantum theories of consciousness suffer from the same difficulties as neural or computational theories. Quantum phenomena have some remarkable functional properties, such as nondeterminism and nonlocality. It is natural to speculate that those properties may play some role in the explanation of cognitive functions, such as random choice and the integration of information and this hypothesis cannot be ruled out a priori. But when it comes to the explanation of experience, quantum processes are in the same boat as

any other. The question of why these processes should give rise to experience is entirely unanswered.”

Karl Pribram

Psychologist Karl Pribram proposed the “Holonomic” model of memory based on the hologram. Many properties of the brain are the same as that of holograms, memory is distributed in the brain and memories do not disappear all of a sudden, but slowly fade away. In Pribram’s opinion a sensory perception is transformed in a “brain wave,” a pattern of electromagnetical activation that propagates through the brain just like the wave front in a liquid. This crossing of the brain provides the interpretation of the sensory perception in the form of a “memory wave,” which in turn crosses the brain. The various waves that travel through the brain can interfere. The interference of a memory wave and a perceptual wave (e.g. visual) generates a structure that resembles a hologram.

Pribram suggested that consciousness may occur primarily in dendritic – dendritic processing and that axonal firing may support primarily automatic, non-conscious activities.

Charles Leadbeater and Annie Besant

According to metaphysicists Charles Leadbeater and Annie Besant information about the relevant subtle body is stored in a “permanent particle” (its composition, frequency, structure and associative memories). In this way the experience that the subtle body has gone through in a particular universe are stored or are linked to this nucleus – which can be transferred more easily to another universe and body through microscopic wormholes. The particle is analogues to DNA in the bio-molecular body. DNA is referred to as a “bio-particle” in the medical literature and it stores or links vast amounts of information about a particular life- form. This physical- etheric nucleus is transferred to higher energy bodies when the subtle body dies – preserving information about a particular life’s experiences. This nucleus is also responsible for the life review in a NDE. According to Besant, the permanent particles are used to preserve within themselves as “powers of vibrations” (i.e. different frequencies and waveforms) the results of all experiences

through which they have passed. By the end of one life in the physical body the “permanent particle” would have stored up “innumerable powers of vibration” (i.e. a set of wave forms of different frequencies).

A personality is simply a packet of self-organized information. If this information can be transferred from one body to another, that personality “lives” on information stored in the physical-etheric body to be “reconstructed” or “resurrected” in a similar physical-etheric body later – in a process analogous to teleportation. According to plasma metaphysics, the physical- etheric body provides an electromagnetic matrix which plays a critical role in the morphogenesis of the physical – bio-molecular body. The nuclei of the various subtle bodies can carry a large volume of complex holographic information about their corresponding bodies and experiences.

Granville Dharmawardena

Many who research on the brain mind-problem proceed with the *a priori* assumption that consciousness is an emergent property of the brain. They consider consciousness to be another property, emerging as a result of trillions of electrical pulses shuttling across the brain. According to this assumption, consciousness is only a property and not an entity. However, Dharmawardena says that on the basis of practical observations we have to reject these assumptions and regard consciousness as a non-material entity capable of independent existence.

The major stumbling block in solving the brain-mind problem had been how the brain-mind binds together millions of disparate neuron activities into an experience of a perceptual whole. How does the “I” or “Self” or the perceived wholeness of our world emerge from a system consisting of so many parts, billions of neurons. What creates the “oneness” or individuality and “I” ness or “Self?” What creates feelings, free will and creativity?

Observations on Out of Body Experience (OBE) and Near Death Experiences (NDE) show that while the body is in an anaesthetized or inactive state consciousness can remain disembodied, observe events from outside the body and later relocalize in the brain. After the body

renormalizes the person can relate what his consciousness observed and heard from an out of body location while the body was inactive. Other experiments have shown that consciousness can leave a dying person, float around observing things and events and later, as Eccles had pointed out, attach itself to an unborn fetus to start a new existence as another individual. Consciousness is therefore a non-material entity capable of independent existence and not a property, it is not emergent.

Dharmawardena proposed a three-tier model for Body-Brain-consciousness, where the brain is sandwiched between the body and consciousness. Here the brain-body link is mechanical and fairly well understood from classical science considerations. Body and brain operate in Einstein's space-time domain where non-locality is forbidden. The brain-consciousness link is established by the property P which links the brain to the quantum domain where non locality can operate. Consciousness is a non-material entity in the quantum domain that is capable of independent existence. Consciousness can remain localized in the brain so long as the emergent quantum property P is functional, just as an electron which is a quantum entity can remain localized in an atom so long as the energy of the electron matches the quantum state it occupies. Whenever the property P breaks down or becomes weak, consciousness can leave the brain and take up a floating existence in the way an electron leaves its atom if it acquires excess energy and starts a floating existence as a free electron. Consciousness can return to the brain if the property P is re-established.

This model explains all the observed properties of consciousness including NDE, OBE and reincarnation. Since all information transfer in a non-local quantum correlation is instantaneous, it explains the speed of human action. It can also be extended to explain phenomena such as telepathy. This explains the individual identity or the "I" ness or self.

Mihai Draganescu

The brain is an information processor. The forms of information in the brain/mind cannot, perhaps, be reduced only to the information carried by bits, even if their organization may carry context and reference significance. There is also a kind of information that has a manifestation

in feelings, meaning, in qualia. Both kinds of information may act also together, constituting a mixed type of information. The brain/mind is working like a computer with the first type of information, called structural, which can always be reduced, in principle, to bits. With the other type of information, called phenomenological, the brain/mind is not working as a computer, but still it is processing this second type of information. And when the two kinds of information are working together, the brain/mind is capable of quite genuine performance as are the processes of deep creation. Roger Penrose proved that the brain has really non-computing ways of processing information.

The second type of information of the brain/mind is not yet recognized and explored by science; the information is not a fundamental notion of science. All the electronic computers are processors of structural information.

There are many levels of information processing in the brain:

1. The psychological level: the highest level. It comprises behavior, intellectual activities, thinking, sentiments, will and others. Could these be explained only by reduction to the known structures of the brain that is only by levels b and c below?
2. The neuronal level that comprises the network of neurons, modules of neurons and the structural organization of the brain.
3. The molecular level that comprises the molecular activities inside the neurons and at the synapses between neurons.

To these levels it may be added:

4. The quantum level, which was proposed by a number of physicists, and
5. The experiential level (phenomenological level) which proved to be a fact of brain and mind reality.

The main scientific attention was given to levels 1,2and 3, although there are still problems referring to their interconnection, especially of level 1 with levels 2 and 3.

The phenomenological level has been studied by Stapp. If the phenomenological sense is a reality, and is a kind of information, it must have a physical substrate. This becomes another serious problem for science. Further, there is a way of coupling (still to be established) between structural processes and phenomenal processes. This is another challenge for science, and there is an explanatory gap.

There is something more, namely the justified inference of the existence of a deep underlying reality of the universe which might be the substratum of the phenomenological senses and a source of primary energy. It is very difficult today to contradict this assertion. This is also a challenge for science.

Many authors consider the brain to be a specific type of quantum device. But all these are lacking an explanation of the manifestation of the phenomenological sense or experience. Draganescu and Kafatos proposed for the necessity of a new quantum-phenomenological theory. They observed “concerning living objects”; it happens that in these objects, from itself, by self-organizations, a coupling of the structural and phenomenological parts emerges as a general property of nature. This coupling may be the basis for explaining the “explanatory gap” of the brain-mind problem. This coupling is different from the coupling of energy and phenomenological information in the deep reality. It seems that there are many forms of coupling of objects and phenomenon in existence.

Two possibilities for quantum – phenomenological theories have been proposed.

1. Based on the concept of intra- openness as proposed by Draganescu
2. Based on an imbrications of structural and phenomenological properties manifested by some quantum fields and corresponding particles.

The second possibility has been examined by Stapp and Richard Amoroso, dismissing the role of the wave function collapse (reduction) for producing experience, considers the coherent quantum waves to play an important role in mind and consciousness phenomena. Amoroso then

presented a Noetic Field Theory making reconciliation of the quantum coherent wave with the phenomenon of experience, a quantum-phenomenological theory. Amoroso shows the possibility of BEC even for protein oligomers *in vitro* and states that “coherence in biology and mind seems to be rule rather than the exception.” Coherent quantum waves are possible in polypeptides, DNA, microtubules, implying water molecules, synaptic connections.

What about the phenomenal experience in connection with quantum wave and BEC in organisms and brain? Is the explanatory gap reduced from the < neuro structure – experience > gap to the < BEC – experience > gap? The way in which experience is present still remains the problem.

According to Amoroso “BEC allows the process to go unlocal and couple the Noumenon state of elemental intelligence.” To accept this, it means that something in the stuff of the BEC has not only a structural character, but also a phenomenological character; therefore there are imbrications of type 2. These imbrications are superior to the Stappian imbrications which are declared to have only physical-informational sources for experience.

It seems that the ingredients of physics, biology (both of the classical and quantum physics) and of the present science of information are not sufficient for the study of the brain/mind. There is more in nature: The phenomenological sense (experience in mind and perhaps in any organism) and the deep underlying reality may be, even, a fundamental consciousness. All these may lead us towards a renewed science.

11.3 So, is Consciousness a Quantum Phenomenon?

Victor J. Stenger thinks that the seemingly profound association between quantum and mind is an artifact, the consequence of unfortunate language used by Bohr, Heisenberg and the others who originally formulated quantum mechanics. In describing the necessary interaction between the observers and what is being observed, and how the state of a system is determined by the act of its measurement, they inadvertently left the impression that human consciousness enters the picture to cause

that state to come into being. This led many who did not understand the physics, but liked the sound of the words used to describe it, to infer a fundamental human role in what was previously a universe that seemed to have a need for neither gods nor humanity.

If Bohr and Heisenberg had spoken of a measurement made by inanimate instruments rather than “observers,” perhaps this strained relationship between quantum and mind would not have been drawn. For nothing in quantum mechanics requires human involvement.

Quantum mechanics does not violate the Copernican principle that the universe cares not a whit about the human race. Long after humanity has disappeared from the scene matter will still undergo the transitions that we call quantum events.

The field theories of consciousness do not appear to have been as widely discussed as other quantum consciousness theories, such as those of Penrose, Stapp or Bohm. David Chalmers argues that there is no particular reason why particular macroscopic physical features in the brain or a particular quantum features e.g. the electromagnetic field in the brain, should give rise to consciousness. Jeffrey Gray also thinks that tests looking for the influence of the electromagnetic field on brain function have been universally negative in their result.

The main argument against the quantum mind proposition is that quantum states in the brain would decohere before they reached a spatial or temporal scale at which they could be useful for neural processing. Michael Price says that quantum effects rarely or never affect human decisions and that classical physics determines the behavior of neurons. Price’s position does not necessarily imply that classical mechanics can explain consciousness, but that quantum effects including superposition and entanglement are insignificant.

Max Tegmark concluded that quantum systems in the brain decohere quickly and cannot control brains functions. The proponents of quantum consciousness theories like Vitiello, Penrose and Hemeroff, and Bernroider, have, however, defended themselves and insist that coherence is preserved.

Bernard Baars, a neurobiologist and co-editor of *Consciousness and Cognition* wrote, “No serious researcher I know believes in an electromagnetic theory of consciousness. It is not really worth talking about scientifically.”

No theory of brain can explain why and how consciousness is a fundamental property of matter. Any theory that tries to manufacture consciousness from some property of matter is doomed to failure. The existence of consciousness is separate from the physical properties of matter. The main problem is the lack of an empirical test for consciousness. We cannot know whether a being is conscious or not. We cannot “measure” consciousness. There is not, up to this moment, any satisfactory explanations for the mechanism of formation of a conscious experience, typified by individuality and subjectivity i.e. the self.

It is evident, the fundamental principle of Jainism that consciousness is the property of the soul and that matter does not possess the property of consciousness cannot be challenged by science. In Jainism the soul, mind and body form a system and for any event of the system there are parallel activities taking place in the three component units. The processes in the brain and cells may have quantum overtones and may be explained by quantum and field theories but this does not mean that such processes are the source of consciousness. In reality these micro processes take place in the body on account of manifestation and expression of consciousness of the soul. A dead body does not support processes of this kind due to absence of soul.

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12

The Path to Emancipation

12.1 Introduction

We know that the mundane existence of the soul is due to karma. As long as the karmas are in balance, the soul takes birth and remains in a bound state. In order for the soul to become free, it must get rid of karma. But this is not easy: the worldly soul is always engaged in some kind of activity, whether mental, verbal or physical, and these activities are normally accompanied by likes and dislikes, i.e. making choices out of available options. All activities that are associated with a sense of attachment and/or aversion bond karma, and the stock of karma is never exhausted. Is there a way out of this problem? Yes, there is: this is what the Tirthankaras teach us. They show the path to get rid of karma and become emancipated into a karma-free state called *moksa*.

The first step on the path of emancipation is gaining an enlightened worldview. Prior to this, the individual had identified the self with the body; he or she did not believe in the existence of the soul. Enlightenment consists of realizing the existence of the soul and the fact that, although the body is the abode of the soul, the body and soul are different entities. This realization is followed by the understanding that the interests of the soul and body are also different: it is not the interest of the body but rather that of the soul that leads to the ultimate objective of realizing the absolute truth.

How do we know that the view of an individual is enlightened? There are five qualities of an enlightened worldview:

1. *Shama*: the subsidence, annihilation or subsidence-cum-annihilation of the *anantanubandhi* passions, indicated by the absence of intense emotions, desires and reactions to events.
2. *Samvega*: the fear of worldly existence and recurrent transmigration or cycle of birth and death, and desire for liberation.
3. *Nirveda*: the soul has no interest in accumulating and possessing material wealth; it believes that these are the source of sorrow, not pleasure. The individual becomes indifferent to such possessions and develops a desire to renounce them.
4. *Anukampa*: compassion and kindness are now part of the individual's character; he or she is sensitive to the sufferings of

others and has a desire to help the sick, the needy, the disabled, the poor, the destitute and those who are handicapped in some way.

5. *Astha*: the individual firmly believes in the existence and emancipation of the soul, heaven and hell, auspicious and inauspicious deeds and all of the teachings of the Tirthankara.

The dawn of an individual's enlightened worldview is like reaching the foothills of Mount Everest completely prepared and with the sole aim of climbing to the top, ready to face the hardships and challenges met on the way. By way of preparation, the individual has suppressed, destroyed, or partly suppressed and partly destroyed both the belief-deluding karma and the most intensive *anantanubandhi* grade of conduct-deluding karma that had prevented him or her from climbing and had convinced him or her that it was pleasurable to go on world tours. Instead, the individual is no longer interested in taking pleasure tours but only wishes to climb Mount Everest.

An enlightened worldview is not enough in itself to realize absolute truth; the individual has to purify his or her conduct to expel all of the factors that prevent him or her from such realizations. The next step in the path of emancipation is to purify one's conduct by following the prescribed code of conduct. This consists of observing vows, applying restraints on activities of the body, speech and mind, giving up negative thinking, controlling emotions, practicing penances and meditation, and steadfastly believing that the teachings of the Tirthankara show the true path that leads to the state of emancipation.

Following the prescribed code of conduct may not be easy for a householder who has to simultaneously fulfill other responsibilities. Therefore it is generally advised to renounce the worldly life and take up an ascetic life, although this is not absolutely essential in the Svetambara tradition. The Digambaras believe that an ascetic life is a must for emancipation.

There are two important concepts for the elimination of karma: *samvara*, stopping the influx of karma; and *nirjara*, reducing and annihilating the stock of karma. This has been explained with the example of emptying a water tank. To empty a water tank, first the intake

must be stopped and then the water must be drained out. Draining the water without stopping the intake cannot empty the tank. This is exactly the process of eliminating karma. The soul has to undertake measures to stop the influx of karma and then annihilate the stock of karma.

Before I discuss these two important concepts and the measures required for their execution, I briefly recapitulate how the karma process takes place.

12.2 The Karma Process

The *dravya* karmas are physical entities and therefore follow the laws (whether known or unknown) of science. We saw in Chapter 3 that karma *varganas* are attracted from the cosmos by the principle of resonance. The karma body vibrates due to the *adhyvasaya* of the soul that is caused by activities, and has a frequency spectrum. Karma *varganas* of a specific frequency are attracted by the resonance principle and bond with the karma body by the force of the passions, *kashayas*, and emotions, *nokashyas*. A wide range of karmas bonds at any instant, usually seven out of the eight main types (since age-determining karma only bonds once per lifetime).

To simplify the process, we can group karmas into two categories: *ghatin*, or psychical, and *aghatin*, or biological, karma. The *varganas* of both groups of karma are attracted and bond through similar causes (yoga and *kashaya*), but the process of bonding differs. The bonding of *ghatin* or psychical karma is mainly a psychical (mental) phenomenon, depending largely on the action of the conscious mind; the body and verbal activities have a supporting role, as it is assumed that their effect on the mind accounts for their actions. The operation of *aghatin* or biological karma mainly depends upon the activities of the body and speech, and the supporting role of mental activity is accounted for by its effects on brain and body. This simplified model of the karma process makes the analysis of *samvara* and *nirjara* easier.

We have shown in Chapter 5 that biological intelligence is superior to manifested psychical intelligence. This is the same as saying that the psychical karmas destroy the basic qualities of the soul and that biological karmas do not. This is why all psychical karmas are

considered to be demerit or inauspicious karmas and biological karmas can be either merit or demerit types. It is also borne out that to bond merit karma the soul has to engage in bodily and speech activities; the mere mental activity of thinking without any bodily activity cannot bond merit karma. It is therefore clear that good actions of the soul that are performed by the body and speech are far more meritorious than the mere mental exercise of thinking, even if the thoughts are good. To do anything good for the self and society, the soul has to engage in good bodily and speech activities as well as possess good thoughts. Service to needy, weak, sick, destitute, poor, and noble persons, with feelings of pleasure, is the way to earn merit. These karmas result in pleasure and fame on their fruition, in addition to future births in the higher states of human and celestial beings. Tirthankara *naama* karma is the highest kind of merit karma.

Negative thinking, thoughts of violence and harming other beings, thoughts containing passions and inauspicious emotions, thoughts of jealousy, slander, sloth, self-interest at the cost of others, and so on bond demerit karma of the psychical type. Bodily and verbal actions that hurt others, injuring other beings, stealing, telling lies, snatching, looting, adulteration, or indulging in any activity that violates the rights and freedom of other living beings, etc. bonds demerit karma of the biological type.

Nirjara is the reverse of the bonding process. In this process, the activities of the mind, body and speech generate vibrations that interact with the karma field and nullify the karma of a similar nature through the principle of resonance, thereby reducing the stock of karma. The karmas so eliminated migrate back into the cosmos as karma *varganas*. We shall make use of this principle in describing the path of emancipation.

12.3 Samvara, Inhibition of Karma

The first step towards liberation is to stop the influx of karma. The arrest of the influx of karma is called inhibition. This involves the inhibition of causes that allow the influx of karma. Accordingly, inhibition is fivefold: right faith, abstinence, absence of remissness (i.e. vigilance), absence of passion, and absence of activity.

Right faith consists of firm conviction in the truthfulness of the tenets propounded by the omniscient Tirthankara. This is the essential condition for inhibition. The ultimate verification of truth is possible only by the Omniscient; one has to accept his perception as a matter of faith until self-realization takes place. Right faith is attained due to the subsidence, destruction, or subsidence-cum-annihilation of wrong belief-deluding karma or with self-realization when moving on the path of spiritual progress. Right faith is characterized by tranquility, fear of transmigration and desire for salvation, and becoming free from worldly sufferings, detachment, compassion, and spiritual belief. Right faith is inhibited by doubt about the ultimate goal, craving for a false goal, praise for the opponents of the right goal, and association with these opponents. A person who is desirous of right faith (and the right goal) has to overcome these inhibitions and accept scriptural knowledge.

Complete compliance with other causes of inhibition is possible only for ascetics who have renounced worldly pleasures. A layperson engaged in a worldly life is not in a position to fully comply with the strict code of conduct required for such attainment. Abstinence consists in the renunciation of sinful propensities, sinful activities and internal cravings. Renunciation follows the stage of right faith. Remissness is contemplation of the self: that is, full awareness of the self. Absence of activity is possible only for an Omniscient person in the last stage of his life.

There are six ways to accomplish the prevention of karma bonding. Four out of these six, *Gupti*, *Samiti*, *Dharma*, *Anupreksha*, are possible, to some extent, for a lay householder; the other two, *Parisahajaya* and *Charitra*, are possible only for ascetics. *Gupti* consists of properly restraining the mental, vocal and physical faculties. In simple terms, this means that an individual has to control his or her mind to expel negative thoughts and direct it to the spiritual welfare of the self and society; control his or her speech so as not to hurt others, even in fun or humor; and control the body so that no harm is done to anyone. *Samiti* consists of maintaining vigilance while moving, speaking, accepting articles, moving any object, and disposing of bodily waste (excreta). *Samiti* thus means taking the utmost care while transacting the business of life and

ensuring that no violence is committed during daily activities. *Gupti* and *Samiti* are closely related; they together constitute the eight main precepts mainly prescribed for the monastic orders, but laymen can also observe them to some extent. Lay people should also remain vigilant while undertaking activities.

Purification of the mind is of the utmost importance in a spiritual life. A pure mind can acquire virtues that were absent earlier. In an impure mind, virtues that are present also lose their effectiveness. Hence a wise person must first try to purify his or her mind. Without purification of the mind, penance and the practicing of vows amount to punishing the body and do not serve any significant purpose in advancing the devotee on the path toward emancipation.

Dharma indicates the attributes that constitute a spiritually purposeful religion. These attributes are forgiveness, mildness, straightforwardness, purity, truth, self-restraint, austerity, renouncing, absence of possession, and celibacy. *Dharma* is more than ethics in the normal sense; it is directed towards the purification of the soul by inculcating virtues that will prevent the individual from doing anything that bonds karma. Forgiveness necessitates the spirit of forbearance and a sense of equanimity. Mildness means humbleness, which is a prerequisite of forbearance. Straightforwardness denotes the absence of crookedness, deceit, duplicity, etc. and a positive sense of sincerity and honesty of purpose. Purity means cleanliness, the removal of the attachments that pollute the soul. Truth means verbal truth, the absence of ambiguity, etc. Self-restraint implies the restraining of the five sense organs, the observance of the five major restraints described above, the overcoming of the four defilements, and the restraining of mental, verbal and physical faculties. It stipulates refraining from every activity that hurts the true self. Austerities are of two kinds: external and internal. Fasting, eating less than one's amount of hunger, limiting the variety of food one consumes, exercising control over tastes, living alone, and facing hardships constitute the external austerities. Repentance, modesty, service, self-study, renunciation and meditation constitute the internal austerities. Renunciation can be of two types: external and internal. Giving up worldly possessions is external renunciation. Giving up one's

attachment to sense objects and overcoming one's cravings, aversion, anger, animosity, arrogance, etc. constitute internal renunciation. The absence of possession is a refinement of renunciation. This emphasizes giving up the desire for possessing rather than merely giving up tangible objects. Celibacy is not only non-indulgence in sexual pleasure but also staying within the Self and being attuned to the soul. We see that *dharma* is a long, prescriptive code of conduct that may be difficult for a householder to comply with. In fact, some of these provisions are really meant for ascetics. For example, a householder may not be in a position to observe all of the restraints, fully undertake the austerities, renounce to a large extent, or entirely give up the sense of belonging. A householder is also required to have a controlled sexual life to maintain the family. The basic idea here is that a householder should try to follow the *dharma* to the extent that is possible and always attempt to advance his candidature towards perfection. The more the better, because it reduces the influx of karma. The strict observance of the rules of *dharma* is only possible for ascetics.

Contemplating evanescence, helplessness, worldliness, aloneness, otherness, the nature of the universe, the rarity of right guidance, and the tenets of the Lord constitute *Anupreksha*. An individual should not lose sight of these basic truths; remembering them reminds one of the pains of worldly existence and maintains one's determination to proceed on the path toward emancipation.

Parishaha consists of bearing hardship for the sake of staying on the right path and eliminating the bondage of karma. Hunger, thirst, cold, heat, insect bites, living in an unclad state, despise, seduction, moving about, maintaining a steady posture, sleeping on a rough bed, bearing reproaches, injury, going for alms, facing disadvantages, disease, thorny grass, dirtiness, honor or awards, intelligence, nescience and failure to comprehend are the main hardships. These twenty-two hardships are not prescribed for laymen; they are relevant only to monks in the initial stages and their number reduces as spiritual progress is made. Only eleven hardships remain in the Omniscient stage and none in the liberated state.

Charitra means putting the precepts into practice. The term is, however, used only in the context of monastic life. The first requirement of monastic life is gaining equanimity. This is when a person realizes that he/she is in a position to observe equanimity and maintain peace of mind and is initiated into the monastic life. As a monk, the person undertakes special types of penances and austerities. With spiritual progress, the monk overcomes all types of defilement except for very subtle, wholesome attachments. Finally, the monk reaches a stage of total detachment. *Parishaha* and *charitra* are equally important for the inhibition and shedding of karma. These advanced practices are primarily prescribed for ascetics, but a householder may also follow them to the extent that is possible.

Inhibition is essentially a mental phenomenon. It is concerned with engaging the mind in the path to emancipation, the realization that worldly pleasures are temporary, and that true pleasure lies inside and is the property of the soul. This realization may come from knowing the precepts of the Tirthankara by reading scriptures or from listening to the sermons of a monk or guru. In this stage, the soul has the right faith and engages in stopping the influx of karma. The six ways of inhibition enable the soul to firmly settle in its resolve to dispense with karma and engage in activities to accomplish its objective. Though *gupti* and *samiti* involve physical activities, they are directed towards making the mind strong enough to resist any temptation towards carelessness that might promote an easy and convenient way of living, which hinders spiritual progress. *Dharma* consists of prescriptions for a disciplined life that prepares the soul for next stages of inhibition, *Parisahajaya* and *Charitra*. This also involves mental preparation for the difficult life ahead. *Anupreksha* continuously reminds the soul of the reality of the world and keeps it on track to achieve the ultimate objective. The mind is the biggest power influencing the soul, and can go in either a positive or negative direction. All of these measures for inhibition rule out the possibility of moving in a negative direction and keep the soul proceeding in the positive direction that is necessary to stop the influx of karma.

The process of inhibition involves a chain of interactions between the subunits of the living system. Vibrations produced in the mind, either directly or by vibrations produced in the brain through physical and verbal activities, interact with the karma body either directly or through the fiery body. Major interactions take place with the psychological karma, which influences the soul and prevents it from indulging in activities that bind karma. Therefore the mind has the most important role in the process of inhibition.

12.4 Nirjara, Shedding of Karma

Some ways of shedding karma were described above. Truly speaking, it is difficult to completely separate the processes of inhibition and shedding of karma. Whatever measures are taken for inhibition also cause some shedding of karma and vice versa. In general, the measures described for inhibition are primarily aimed at fulfilling that objective and promoting annihilation by weakening the karma bonds. Similarly, the measures prescribed for the annihilation of karma are primarily aimed at that objective but also help inhibition.

The Tatvartha Sutra describes two measures for the shedding of karma: external penance (*tapa*) and internal penance. The six external penances or austerity practices primarily related to the body are: fasting (*anasana*); eating less than hunger demands (*avamodarya*); limiting the places of getting alms (*vritiparisamkhyana*); controlling taste by limiting the variety of food (*rasapriyaga*); living in sacred and isolated places for self-study and meditation (*viviktashaiyyasana*); and tolerating extreme climatic conditions to give up the attachment to the body (*kayaklesha*). The internal austerities or penance practices are primarily related to the mind and spirit. These are: expiation (*prayaschitta*), action undertaken for the purification of blemishes committed in the observance of the prescribed conduct, humility and modesty (*vinay*); respecting the great and divine souls; service to monks and ascetics, both physically and by offering articles of use (*vaiyavriya*); self-study (*swadhyaya*); being always ready to gain knowledge; renunciation of both external and internal possessions (*vyutsargaa*); and contemplation and meditation. The shedding of karma can be both voluntary and involuntary. The voluntary act is affected by volition, i.e., a desire for spiritual

emancipation. Both kinds of karma shedding are possible in persons who possess either right or wrong faith. Penance by a person who has wrong faith is called *balatapa*, like penance done by a child, as he or she does not know the real purpose of his or her activity. He or she takes this exercise without inhibition measures and it therefore has no tangible effect on exhausting the stock of karma. This is also the case with persons who undertake penance without right faith, *samyagdarshan*.

The popular notion is that the greater the tolerance of hardship, the greater the annihilation of karma. This is true to some extent, but without knowledge of the basis of truth, the secret of the science of karma cannot be grasped. There are two main states of karma, intensified and loosened. In the intensified state, even the excessive tolerance of hardship results in only a meager annihilation of karma. In the loosened state, even minimal tolerance of hardship results in the massive annihilation of karma. There are four possibilities:

State of karma	Experience	Annihilation of karma
Intensified	Intense experience	Meager falling away of karma
Loosened	Intense experience	Massive falling away of karma
Loosened	Weak experience	Meager falling away of karma
Loosened	Weak experience	Massive falling away of karma

There are three rules:

1. Experiencing intense pain, in which there is massive annihilation of karma
2. Whether the experience of pain is intense or little, the auspicious falling away of karma is massive
3. When the karma is intensified, there is little falling away of karma, in spite of experiencing intensive pain. For example, the infernals of the 6th and 7th lands experience intense pain but there is little falling away of karma. On the other hand, a monk experiences little pain, but there is massive falling away of karma because he has loosened his karma by measures of inhibition.

12.5 Meditation (*Dhyana*)

I will now describe meditation in more detail. *Dhyana*, meditation, is of four types: (1) *aartadhyana*, (2) *raudradhyana*, (3) *dharmadhyana*, and (4) *shukladhyana*. The first two types force the soul to be reborn and go into the cycle of life and death; the last two types help the soul to achieve liberation.

1. *Aartadhyana*: Many people continuously worry about their painful and unhappy situations. Such mental worrying is termed *aartadhyana*. There are mainly four situations in which worry occurs: to avert a disagreeable situation; to avert a painful situation; to regain a lost favourable situation; and when someone has a strong inclination to stake everything for some worldly gain.
2. *Raudradhyana*: Maintaining a violent, untruthful, stealthy and sensual mode of life constitutes *raudradhyana*. In this state, a person not only resorts to wrong and violent means, but he or she also enjoys such actions.
3. *Dharmadhyana*: Contemplating the nature of the soul: that is, contemplation that leads to self-realization.
4. *Shukladhyana*: Perfect meditation, which is only possible for spiritually advanced monks who have considerably reduced their passions.

12.5.1 *Dharmadhyana* (Contemplation)

Contemplation is useful for everyone, including scientists, scholars and spiritualists. It helps to know the properties of both the soul and matter. Traditionally, some scholars limit *dharmadhyana* to exploring only the soul, to the exclusion of science. However, this is a narrow view of contemplation. Gatha 55 of the Vrihad-Dravya Samgraha says that when a monk is contemplating an object and becomes one with it, and when his perceptions are pure, then he is in a state of meditation. Here, thinking of not only the soul but also of the nature of any object is considered to be contemplation. Acharya Mahaprajna also extended the definition of *dharmadhyana*; making it applicable to both the soul and matter. I use this approach here to understand spirituality and science from a wider perspective.

Dharmadhyana has four parts: (1) *ajnavichaya*, (2) *apayavichaya*, (3) *vipakavichaya*, and (4) *samsthanavichaya*. *Vichaya* means to contemplate. Thus, the four parts mean:

1. *Ajnavichaya*: To contemplate the teachings of the Omniscient Tirthankara, which mainly refer to the inherently blissful nature of the soul, the impact of karma on the worldly soul, and the ways to get rid of karma.
2. *Apayavichaya*: To contemplate the causes of distress and unhappiness, i.e. because of inauspicious karma. Such contemplation can help in refraining from undertaking anything that would result in unhappiness.
3. *Vipakvichaya*: To contemplate the results of rising karma.
4. *Samsthanvichaya*: To contemplate the nature of the *loka*(this helps in identifying the self).

This interpretation of *dharmadhyana* has been made from the point of view of spirituality. Taking a generalized view, the four parts reveal an extended perspective. In the following discussion, I elaborate on this approach.

***Ajnavichaya* (Contemplation on the teachings or findings of an authority)**

The primary focus of Jain practices is on the liberation of the soul; for this, the teachings of the Omniscient Tirthankara are the object of our contemplation. While this is true, there are many other activities that are important in life, and each field has its own authorities that must be accepted. For example, the Acharyas of Ayurveda discovered the properties of medicinal plants through *dharmadhyana*, and this is considered to be authentic knowledge in that field. Science has discovered experimental proof of subtle forms of matter that cannot be known through the senses directly: these are also authentic findings. Jain texts propound that plants are living beings. Our senses are unable to directly know this fact, so we accept the teachings of the Omniscient Tirthankara in this context with full faith. On the other hand, without knowing the teachings of the Tirthankara, modern science has also proven experimentally that plants have life. In that case, why don't we

have faith in science? Non-acceptance of scientific views, which also present valid knowledge, may prevent us from knowing the multiple aspects of the truth. So it is necessary that we accept all those scientific principles that describe the truth as well as viewing the discoverers as authorities in their respective fields.

In practical life we come across many people, and relations and interactions with them are desired for our happiness. In a family, obeying the instructions and advice of the head of the family brings happiness and cordial relations within the family. In social life, it is essential to follow the Constitution to maintain order and avoid punishment. Similarly, the orders of one's guru are to be obeyed in spiritual life. From this perspective, contemplation of the teachings or findings of any text or individual that is an authority in any field constitutes *ajnavichaya*. Contemplating the laws of Newton or the theory of Einstein constitutes *ajnavichaya* in their respective fields.

It is necessary to know all of the properties and modes of a substance to know its full truth. This is a matter of personal experience, beyond the senses and mind; it is not the subject of science or books. From this point of view, both science and the scriptures are incomplete: we are far from the truth when we know the texts and teachings only as *sruti* without experiencing it for ourselves.

How do we know the teachings and findings of the authorities? Study and information is the only way. Great emphasis has been given to study and information collection in both the spiritual and practical life. It is evident that study and research are important tools for a person contemplating the truth.

***Apayavichaya* (Analytical thinking)**

Apayavichaya is the process of analytical thinking. To know reality it is necessary to know the basics. The universe contains things that are related and mixed. The seeker of reality analyses these relationships and, by eliminating the non-essential elements and relationships, identifies the existence of the real thing. For instance, a spiritual person seeking the answer to the question "Who am I?" thinks that he or she is not sound, shape, smell, taste, or touch; he or she is not body, speech, or mind; he or she is not senses or *prana*; he or she is not anger, ego, deceit and greed,

etc.: and in this way, by eliminating the unrelated options, ultimately arrives at the conclusion that he or she is actually the conscious soul. A spiritualist analyses his or her shortcomings and progresses on his or her cherished path of liberation by removing them. In the same way, a scientist finds out the elements that are present in a composition through the process of analysis and the scientific method of elimination. Therefore, such a scientific method also constitutes *apayavichaya*.

***Vipakavichaya* (Results and transformation)**

In this process of contemplation, the mind is focused on the results and transformations that take place due to changes in the system. Traditionally, this is related to the rise of karma and thinking of its consequences on the soul, but this is only one example of the process. As we know, there are two causes of the rise of karma: the main cause (*upadaana*) and the auxiliary cause (*nimitta*). The same is also true for a chemical process. A reaction takes place due to the nature of the reacting elements (*upadaana*) and the catalyst (*nimitta*). Milk turns into curds because milk has the property of converting into curds, and the added agent is the auxiliary cause in this process. Temperature is another factor. A material scientist or metallurgist knows the properties of the elements that are being mixed and also knows the effects of the additives on the main elements. By this knowledge, he or she devises a method of changing the properties of the basic elements. This process is followed to make steel from wrought iron, for example, and to produce many special kinds of steel to be used in different applications. Transformation in the properties of basic elements and their mixtures is an important area of science. All of these scientific methods fall in the category of *vipakvichaya*.

***Samsthanavichaya* (Synthesis)**

By this process of contemplation, the monks used to discover the properties and modes of matter: their shape, fundamental form and other authentic qualities that were required for their continued existence in a new form after combination. The combination and synthesis of basic elements with different properties produce new products and articles. Bhagawati canon describes many such combinations. This kind of

knowledge was discovered by the monks through the method of *samsthanavichaya*.

The process of synthesis forms an important branch of study in science and technology. In this way, new products, gadgets, equipment, appliances and machines are designed and produced. For example, television, mobile phones, computers etc. have been developed and new models are being introduced into the market every day. There is no end to this process since there are infinite modes of *pudgala*, matter that can combine in endless ways. Thus the principle of synthesis is an important part of contemplation in both spiritual and scientific life.

Strictly speaking, *dharmadhyana* is a methodology for exploring the nature of substances and discovering new properties and modes. The soul is the subject of exploration in spirituality; matter is the substance of study in science. The mind is focused on the soul in spirituality and on matter in science. The two approaches are similar; both aim at discovering the truth. *Dharmadhyana* is a scientific methodology, therefore spirituality is a science and a spiritualist is a scientist of the highest order. This is one reason that Jainism is known as a scientific religion. A spiritual practitioner achieves his goal through the four kinds of contemplation, and the same is true for a scientist. This wider perspective of *dharmadhyana* enables us to integrate different human activities, since the basic force behind them is the power of the soul.

Dharmadhyana is considered to be a means of liberation. This proposition has been made from the point of view of spirituality. Is a scientist following the same methodology also on the path of liberation? The traditional definition of *dharmadhyana* does not allow us to make this assumption, but that does not appear to be the full truth. All of the chief disciples (Ganadhara) of Mahavira were perverse individuals with wrong faith before becoming his followers. But they were great scholars and were practicing *dharmadhyana* for their study. On coming into contact with Mahavira they became spiritualists, developed right faith and, proceeding on the path of *moksa*, became *kevali*. In the same way, a scientist knowing the relevant methodology can advance on the path of spirituality by meeting a suitable source and can also prove better than others in this respect. From this point of view, scientific study indirectly

prepares a person for spiritual activity. A scientist, besides contributing to his or her field of study, also enhances his or her candidature and ability for the spiritual journey; on meeting an opportune occasion, a scientist can tread the path of spirituality faster than ordinary individuals. From the spiritual perspective, scientific study should also be given high recognition similar to that given to religious activities.

12.6 Omniscient and Tirthankara

On the elimination of psychical karma, the soul becomes omniscient and has infinite knowledge, *jnana*, infinite awareness and perception, *darshana*, infinite bliss and infinite soul power, *virya*. The passions, *kashayas*, and emotions, *nokashayas*, are absent and the conscious mind has ceased to exist. There is no thinking, no memory, no desire, no choices to make, and no likes and dislikes. The Omniscient only experiences and speaks truth spontaneously, without resorting to thinking, logic and memory. Nothing in the world, past, present or future, is unknown to an Omniscient. He or she knows the smallest *paramanu* and all of the non-physical substances (*dravyas*), which are unknown to mundane souls. He or she is constantly aware of his or her existence; all worldly things, including his or her own body, have no attraction for him or her.

Some qualities of Omniscient-like knowledge were discussed in Chapter 9. A Tirthankara is omniscient but also has some additional qualities because of the rise of Tirthankara *naama* karma. A Tirthankara has no guru or teacher, but is self-made; an omniscient (*kevali*) may have had the help of scriptures or of a guru or teacher. At any time, there are only 20-170 Tirthankaras in the *loka* (two-and half islands) but there are 2-9 crore omniscient souls. Tirthankara do not speak in words (in *Samavasarana* (religious congregation?), according to Digambara tradition), but an omniscient can do so. A Tirthankara has 34 superhuman qualities that are not found in an omniscient. Four of these qualities are by birth; eleven qualities are due to the rise of Tirthankara *naama* karma, and nineteen extraordinary features are produced by the celestial gods. The four extraordinary qualities by birth are: having a body with extraordinary form and smell, and without any ailment, and without sweat or excretion. Tirthankaras' breath smells like lotus

flowers, their blood is white, and their nutrition is possible by invisible sources. The eleven superhuman qualities produced by the rise of Tirthankara *naama* karma include *divyadhvani*, radiating sound waves understood by all humans, celestial beings and animals; no disease; no rivalry; no harmful insects and pests; no epidemics or untimely death; no floods and droughts; no famine; and no fear, in an area of 1000 miles (125 yojana) radius. How do we explain these feats?

The Tirthankara experiences infinite psychical intelligence in the absence of psychical karma, and only biological intelligence manifests in the body. The working of the body system is changed in the absence of passions, emotions and the conscious mind (*bhavamana*). The brain is no longer directed by the mind, but functions only as a processing unit for the body without conscious memories. The hormone secretions also change; only a limited type of hormones are secreted, reducing the variations in the states of the body to a minimum, as is compatible with the enlightened state of the soul. The chemistry of the body must also change; the body now remains energetic and healthy with minimal or no food intake. The energy requirement of the body is at a minimum and is fulfilled from the input received through the skin, breathing and *prana*. The immune system becomes highly powerful, changing the properties of the blood. The efficiency of cell functioning is also high and there is no waste. It is known by scientific experiments that DNA and cells can be modified by radiation and radio waves. It appears that in the omniscient state every cell becomes a transmitter and receiver of radio signals. A Tirthankara is able to produce signals in the cells by the rise of Tirthankara *naama* karma, which is transmitted by *manovargana* (the *dravyamana* continues to exist in this state) into the surroundings in a wide range of frequency. The messages so transmitted are received by the minds of beings; they receive the message of the Tirthankara without the necessity of speech. Each kind of being, e.g. humans, animals and celestial beings, receive the message in a frequency range suitable to their system and understanding. By the reverse process, the Tirthankara knows the minds of the audience and replies to their questions and queries without anybody uttering a word. This way of communication is highly efficient and the Tirthankara, having infinite intelligence, can

simultaneously communicate with all beings. Communication through waves is free from the problem of language diversity and even animals knowing no language can make sense of the message in their own way. As this communication is sent by the cells, the whole body becomes a medium of transmission that takes place in all directions. It is known that in the state of omniscience the whole body becomes *karana*, an organ of intelligent action and super-sensory perception, the normal sense organs losing their specific purposes. This is an extraordinary scientific feat observed in Tirthankara.

The other extraordinary qualities produced by the rise of Tirthankara *naama* karma are perhaps accomplished with the help of *prana*. *Prana* is a potent energy that can interact with living beings as well as matter and produce changes that are favourable, since the omniscient has destroyed all karmas that could produce unfavourable modes. *Prana* energy is radiated from the fiery body, stimulated by signals from the rising *naama* karma. The Tirthankara has no wish or will to affect any change, but it is the property of the *prana* energy that it becomes an auxiliary cause in producing favourable modes in living beings and other objects in nature. The main cause of these changes is the karmas in the living beings and the properties of the objects themselves.

A question is sometimes raised as to why a Tirthankara, having no desire or attachment, should organize *Tirtha* (*sangha*) and deliver sermons (through *divyadhvani*)? The Tirthankara does not do so by any specific desire; the rise of Tirthankara *naama* karma manifests the biological intelligence that affects these activities of body and speech (through sound waves) in a natural way without affecting the tranquility and calmness of his soul. These activities attract an influx of karma *varganas* – but the bonding is of a spontaneous type that sheds the next moment without increasing the karma balance. Whatever little balance of biological karma remains is eliminated in the last stage of a Tirthankara's life by a special process described in Jain texts; the soul is then liberated, becoming free from bonds forever.

The question of the status of time and space in the life of the Omniscient is important. The notion of empirical time is connected with

matter and hence with the body. Therefore concepts like the duration of time, age, time interval, etc. are valid only as long as the body is attached to the soul. For example, an Omniscient with a physical body can perceive time duration and can distinguish between past, present and future. The Omniscient in fact lives in two modes: in one, he is fully engaged in the self, the state of Samadhi, and is not aware of the body. In this mode, he lives in an eternal present, while past and future have lost their significance. In this state, empirical time collapses into present time; the past and future also becomes the present and all the modes of all substances are revealed to the Omniscient soul simultaneously. He is aware of these modes but does not take their cognizance, as the desire to interact is absent. There is another mode of omniscience in which the Omniscient soul is aware of its body and the activities of mind, speech and body, and hence is also aware of empirical time. In this mode, the Omniscient soul perceives the time difference between events and sees the past and future in the normal sense. It can also answer questions regarding the past and future modes of objects and substances.

The *siddha*, or liberated soul in the absence of a physical body, does not perceive empirical time. It experiences only an eternal present; past and future are meaningless to it. Absolute or transcendental time is still relevant, since the liberated soul experiences changes in modes which are now of a subtle, *artha*, type. With the collapse of empirical time, movements in the physical world lose their significance and the soul must perceive the *loka* in a steady state, the existence of all objects being reflected without any motion, i.e. the liberated soul sees the *loka* in a static condition; of course, it has nothing to do with the *loka* in the absence of interaction. It experiences the self and its inherent qualities all the time; this state is perfect by itself and requires no addition or deletion of any kind.

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Is the Jain *Loka* a Multi-region (or Multiverse!) Structure?

13.1 Introduction

The universe we live in has always been an object of inquiry. All ancient civilizations have pondered this matter and developed different philosophical understandings. The omniscient Tirthankaras experienced reality in its absolute form and therefore knew the whole *loka*. Mahavira replied to all questions about the *loka*. These descriptions given in the Agamas are based on direct experience.

Modern science has explored the universe through both theoretical analysis and experimental observations. Correlations have been established between the predictions of theory and the experimentally obtained data to arrive at the most likely explanation. In this endeavor, the Big Bang Theory is the most accepted version today. However, there are still many unanswered questions and efforts are underway within scientific circles to improve our understanding of nature and present a realistic theory of the universe.

Jainism has an eternal, finite universe, the *loka*, with a well-defined shape and detailed descriptions of its various parts. Jain ideas are at variance with modern theories. This, therefore, calls for a comparative study in order to solve the enigma of the universe. In this chapter I briefly review modern scientific theories including the Big Bang Theory, inflation theory, chaotic inflation theory, etc., and examine them from a Jain perspective. I also try to understand the Jain *loka* from a modern perspective. It is hoped that this kind of comparative study will improve our understanding of the reality of the universe and *loka*.

13.2 The Multiverse Hypothesis

The Big Bang Theory is currently the most accepted cosmological theory of the Universe. According to the Big Bang Theory, everything in

the universe, all forms of matter and energy, and even space-time itself, came into being in a single event, a gravitational singularity; as space expanded over time, the matter and energy cooled sufficiently to allow the stable condensation of elementary particles into primordial nuclei and atoms. With further cooling, the atoms aggregated, forming large structures like stars, planets, galaxies, and clusters and super clusters of galaxies.

In the past few decades, an extraordinary claim has captivated cosmologists: the expanding universe we see around us may not be the only one; billions of other universes may be out there too. There is not one universe, but a multiverse. The multiverse (or meta-universe) is the hypothetical set of finite or infinite possible universes, including the universe we live in. The various universes within the multiverse are called “parallel universes” or “alternative universes.”

“Gravitational waves rippling through the aftermath of the Big Bang, physicists suggest, point to the existence of the multiverse. This is because these gravitational waves point to a particularly prolific kind of “inflation” of the early universe: an exponential expansion of the dimensions of space to many times the size of our own universe in the first fraction of a second of the Big Bang, some 13.82 billion years ago.”

According to Guth, the existence of a multiverse can explain a lot of things that now confuse cosmologists about our universe. For example, there is the 1998 discovery that galaxies in our universe seem to be spreading apart at an accelerating rate, when their mutual attraction should be slowing them down. This discovery is generally thought to imply the existence of a “dark energy” that counteracts gravity on cosmic scales. However, its nature is a profound mystery as yet. Guth says “There is tremendous mismatch between what we calculate the dark energy ought to be and what we observe”. This discrepancy has been a great source of embarrassment to physicists. A multiverse could offer solution to this problem. Of all possible universe spawned by inflation, our universe might just happen to be one of the few universes in which the dark energy is relatively lame. In others antigravity force might conform to physicists’ expectations and be strong enough to rip all matter apart

A multiverse might also explain the number of dimensions predicted by modern “superstring” theory. String theory describes subatomic particles as being composed of tiny strings of energy, but this requires the existence of 11 dimensions instead of the four we can actually observe. Maybe this just describes all possible universes, instead of our own.

Andrei Linde developed the theory of “eternal chaotic inflation” giving rise to multiple universes (including ours), separated by unimaginable gulfs of distance, stretching perhaps to infinity. In this model, our universe is full of stars and planets and extends to encompass many more dimensions that are devoid of such mundane things as atoms or photons of light. This means that, spread across space at distances far larger than the roughly 92 billion light-year-width of the universe we can observe, other universes reside, some with many more dimensions and different physical properties and trajectories. That is, what we had previously called “the universe” can be divided into extremely large regions that may have different laws of physics each. Of these, one part may be suitable for life and other parts unsuitable.

“The multiverse may even help explain one of the more vexing paradoxes about our world, sometimes called the “anthropic” principle: the fact that we are here to observe it. To cosmologists, our universe looks disturbingly fine-tuned for life. Without this the perfect alignment of the physical constants – everything from the strength of the force attracting electrons to atoms to the relative weakness of gravity – planets and suns, biochemistry, and life itself would be impossible.”

“What is the evidence for these theories of cosmic inflation, eternal chaotic inflation and multiple universes? It is challenging considering that cosmic inflation began and ended within the tiniest fraction of the first second of our universe’s existence. Eternal chaotic inflation, by definition, cannot be seen, since other universes are disconnected permanently from our universe. Yet lines of corroborative evidence (beyond the elegance of equations) have convinced many cosmologists to such a degree that cosmic inflation and eternal cosmic inflation has become, in essence, the “standard model” of cosmology. As for cosmic

inflation, it seems to solve several separate enigmas in the origin and structure of the universe (including the horizon problem). Moreover, cosmic inflation makes interesting predictions, especially about the cosmic microwave background radiation, a remnant of the Big Bang – predictions that have been confirmed and reconfirmed by increasingly precise data from satellites.”

Max Tegmark goes further. He envisions four kinds of multiverses that may exist, labeling them Levels:

Level I: Beyond our Cosmological Horizon. “Space in our universe goes on far beyond that which we can see, and perhaps goes on forever – which would mean that infinitely many regions exist in our own pocket universe, regions like our observable universe, where the laws of physics are the same.”

Level II: Universes with different physical constants. “Infinitely many other regions exist in the same space-time as that of our universe, but they are disconnected permanently from our pocket universe and within each of them the laws of physics are different.”

Level III: Many-worlds interpretation of quantum mechanics.

Level IV: Ultimate ensemble. “This level considers all universes to be equally real which can be described by different mathematical structures.”

Tegmark’s Level I is accepted by almost all cosmologists, and Level II has become the “standard model” of cosmology. His Level III is speculative and controversial and Level IV seeks the deep truths of existence (i.e. reality is mathematics).

Not every cosmologist is a full convert to the multiverse. Paul Steinhardt claims that multiverse theories have gained currency mostly because too much has been invested in theories that have failed, e.g. inflation or string theory. He tends to see them an attempt to redefine the values of science, to which he objects even more strongly. Physicist Paul Davies says that although there are good reasons for supposing that what we see may not be all that exists, the hypothesis falls far short of being a complete theory of existence. A multiverse is often presented as solving the mysteries of existence by assuming that if there are an infinite

number of universes, then “everything is out there somewhere, so that is the end of the story.” Davies said there are about 10 different basic assumptions of physical laws that are required to get the multiverse theory to work. He dismissed the idea that “any universe you like is out there somewhere. He thinks that such an idea is just ridiculous and it explains nothing.” He feels that an infinite number of universes do not make sense. Something is amiss.

13.3 Matter in Jain Philosophy

Before we describe Jain cosmology, I briefly review the properties of matter, called *Pudgalastikaya* in Jainism, that are pertinent to our discussion. *Pudgalastikaya* is one of the six constituent *dravyas* (substances or realities) of the *loka* in Jainism, and is the only substance that is sense-perceptible. The sense attributes of *pudgala* are colour, taste, smell and touch, which are the basis of its diversity of forms and structures. The smallest constituent of *pudgala* is *paramanu*; the other forms are its combinations. *Pudgala* is tangible reality within sensuous and super-sensuous experiences, in perceptible and imperceptible conditions. *Pudgala* is permanent, non-living, non-conscious, extensive, physical, corporeal and concrete, active, disintegrating and integrating, and changeable. It is characterized by origination, decay and permanence without giving up its essential nature.

Based on the sense qualities, the matter in nature is of three types:

1. Matter having one colour, one smell, one taste and two touches.
2. Matter having five colours, two smells, five tastes and four touches.
3. Matter having five colours, two smells, five tastes and eight touches.

Paramanu is the two-touch matter (*pudgala*); it has only one colour, one smell and one taste. In modern terminology, *paramanu* is a dynamic entity with a thermal state and either a positive (*snigdha* touch) or negative (*ruksha* touch) charge. So the fundamental form of matter is energy in the form of an electric charge, with a thermal state. The four-touch *pudgala* comprise the subtle (*suksama*) class of matter, as aggregates of *paramanus* (*skandha*). This matter has five colours, two smells and five tastes. On the other hand, eight-touch matter constitutes

the gross (*badara*) class of aggregates comprising energy and matter. These aggregates have five colours, two smells and five tastes. Mass is not a fundamental property of matter in Jainism. The weight (or mass) of the aggregate is said to relate to the light and heavy qualities of touch. The four-touch aggregates and *paramanu* are weight (mass)-less. Weight is a property of eight-touch gross aggregate matter.

Vargana is another important concept to understand the nature of matter, particularly at the subtle level. *Vargana* has been defined as a *pudgala* aggregate made up of similar *paramanus*, and also as a cluster of *paramanus*. Gommatsara Jivakanda provides a classification of *varganas* on the basis of the number of *paramanus* present in the cluster. According to this classification, there are 23 main types of *varganas* found all over the *loka* (universe). The *varganas* fall into two broad categories: one with four touches and the other with eight touches. The second to fourteenth order *varganas* are of the four-touch type and weightless. The sixteenth to twenty-third order *varganas* are of the eight-touch type and have weight. The fifteenth order *vargana* falls between the two categories and its nature is uncertain.

The lower-order weightless *varganas* can be divided into two groups:

1. Associable *varganas*: *varganas* that associate with the soul and form various kinds of subtle bodies and other structures that assist the soul in its worldly functioning.
2. Non-associable *varganas*: *varganas* that do not associate with the soul.

The higher-order *varganas* can be divided into three groups:

1. *Varganas* that are helpful in the formation of the gross bodies of plants and small microorganisms (*nigodas*) belonging to the category of non-mobile beings (*Sthavarajivas*). The *vargana* that assists in the formation of plant bodies is comparable to sunlight (photons).
2. Permanent Nil (*Sunya*) *Varganas*. Detailed information about these *varganas* is not available in the scriptures.

3. Gross Matter (*Mahaskandha*) *Vargana* (GMV). This *vargana* is supposed to constitute all ordinary matter, whether visible or invisible, e.g. all electrons, protons, neutrons, gases, liquids, solids, etc., in the universe, including the bodies of mobile beings.

13.3.1 Dark Energy and Dark Matter

There is no direct mention of dark energy or dark matter in the Jain scriptures. The non-associable *varganas* described above are weightless and gravity-free. These *varganas* may comprise a good fraction of the total mass present in the *loka* that is gravity-free. The Permanent Nil *Varganas* may be considered dark matter, as they are not detected by ordinary means. These *varganas* may constitute a significant portion of the mass present in the *loka*. The matter formed by these *varganas* could be non-baryonic, since baryonic matter is formed by higher Gross Matter *Vargana* (GMV). Jainism supports the scientific view that mass is not the exclusive property of ordinary matter. According to Jainism, even photons have mass.

13.3.2 The Laws of the Subtle Cosmos

Modern science has discovered that as we go from the macro to the micro state of matter, new attributes of matter come into action and the number of attributes increases. The macro world is deterministic and follows the laws of classical mechanics. The micro world follows the laws of quantum mechanics. Some laws of classical mechanics are not valid in the micro world. It may be noted that the macro and micro worlds of science comprise eight-touch gross aggregates containing mass, i.e. higher-order *varganas* in bonded form. The weightless four-touch *vargana* subtle aggregates, which exist only in energy form, are a different class of matter. The weightless four-touch *varganas* do not carry fundamental forces since their *paramanus* are supposed to be in unbound state. Their behavior, therefore, must not be governed by the known laws of science. On extrapolating, we expect that at the subtle level of the physical world, e.g. the weightless four-touch *vargana*, there may be yet another set of principles in operation which is still not discovered by science.

13.4 Jain Cosmology: *Loka*

The universe in Jainism is the space that contains the six real – *Jiva* (soul), *pudgala*, *akasa* (space), *kala* (time, *kala* is the passive agent of change of modes of real), *dharmastikaya* (passive agent of motion of soul and matter) and *adharmastikaya* (passive agent for non-motion of soul and matter). “Time” as used in science is equivalent to empirical time (*vyavaharakala*) in Jainism, which is the means of measuring the duration of time intervals. Empirical time is defined with respect to the movement of some chosen object like the sun or moon and is only applicable to events related to *pudgala*. Empirical time is not defined for the soul or any other eternal real. For example, *akasa* (space) is eternal; it did not come into being at any particular instant, as is supposed by the Big Bang Theory. In Jainism the universe is eternal; it was neither created by a supernatural power like God nor by any event like the Big Bang. *Akasa* is infinite and our universe, the *loka*, is a tiny spot located in this infinite space. The *akasa* beyond the universe, called *aloka*, contains no other real; it is only empty space.

Loka, being finite, has a shape. Bhagwati Sutra 7.3 describes the shape of the *loka* as *trisharavasamputakar*, which means that the shape of the *loka* is obtained by assembling three bowls of nearly truncated conical shape, as shown in Figure 1. The lower *loka* is an inverted bowl and two bowls placed one above another constitute the upper *loka*; the lower one is in an upright position and the upper one is inverted and placed over it. The two bowls of the upper *loka* provide the shape of *mridanga*, a musical instrument of the drum family. The total height of the *loka* is 14 *rajju*; the height of the lower *loka* and upper *loka* is 7 *rajju* each. *Rajju* is a very large distance measuring billions of light-years. The width at the bottom of the lower *loka* is slightly less than 7 *rajju*. The width is 1 *rajju* at the middle *loka*, 5 *rajju* at the *brahma loka*, and 1 *rajju* at the top. The cross section of the *loka* at any height is circular. Some other geometries of the *loka* have been described in Digambara and Svetambara texts, but these geometries have corners that are unlikely to exist in nature, since all astronomical structures are seen to be nearly circular or spherical, without corners.

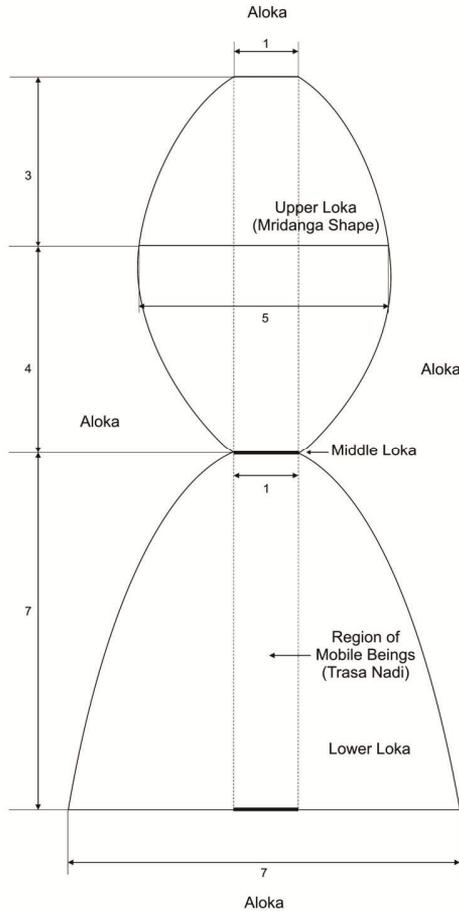


Figure 1. Three Bowl-Shaped *Loka*. Distances are in *rajju*. The upper two bowls together produce a *mridanga* (a musical drum) shape. The middle *loka* at the junction of the lower two bowls is a flat disc of 1 *rajju* diameter.

Worldly souls, which are impure due to their association with karma, exist in four classes: animals with one to five senses, human beings, infernal beings living in hells, and celestial beings living in heavens. All of these beings fall into two groups, mobile and immobile. Mobile beings can move by themselves and include all four classes of beings. Immobile beings are the lowest class of animals and have only one sense of touch. These beings cannot move by their own effort.

Immobile beings are of two types, subtle and gross; subtle beings are invisible to the eye.

The *loka* is divided into regions according to the class of beings that live in that region. The central region of the *loka* is called the *trasanadi*, or mobile zone, the abode of mobile organisms (see Figure 2). The cross-section of the mobile zone is circular with a diameter of 1 *rajju*. The height of the mobile zone is 14 *rajju*. All-mobile beings, including celestial and infernal beings, inhabit this zone. This means that mobile beings are found in a region of space of only about 10 cubic *rajju* out of the total space of 343 cubic *rajju* of the whole *loka*. The bottom part of *trasanadi* of about one cubic *rajju* contains inexhaustible number of *nigoda jiva* in passive mode.

13.5 Middle Loka

Because the structure of the middle *loka* is of special interest, I will describe it first. This part of the *loka* contains innumerable (*asamkhyat*) ring-shaped circular islands (*dweepas*) separated by as many ring-shaped circular oceans (*samudras*) arranged in a circumscribing fashion one after another. The middle circular island is called *Jambudweepa*, which, according to some scholars, is supposed to be our planet Earth. Such island structures are not found in nature and require proper interpretation. This description is symbolic, with the oceans representing large spaces between the islands and the rings representing the orbits of the moving islands. The islands could be astronomical objects, such as planets. There are also innumerable celestial objects like stars, suns, moons, and planets orbiting the mountain called Mount Meru, which is situated at the center of *Jambudweepa*. These celestial objects, called *Jyotishka Deva*, stars and moons, are found in circular orbits all over the middle *loka* starting at some distance from Mount Meru and continuing until the last island. The orbital paths of all celestial objects lie in a small axial space of 110 *yojana* starting at height of 790 *yojanas* above *Jambudweepa*. *Yojana* is a measure of distance used in astronomical applications and is equal to 8000 miles (4000 miles in the Digambara tradition). This means that the middle *loka* contains stars, planets, galaxies, etc., separated by large distances and moving in orbits. According to present scientific knowledge, there are about 100-140 billion galaxies containing a total of about 7×10^{22} stars.

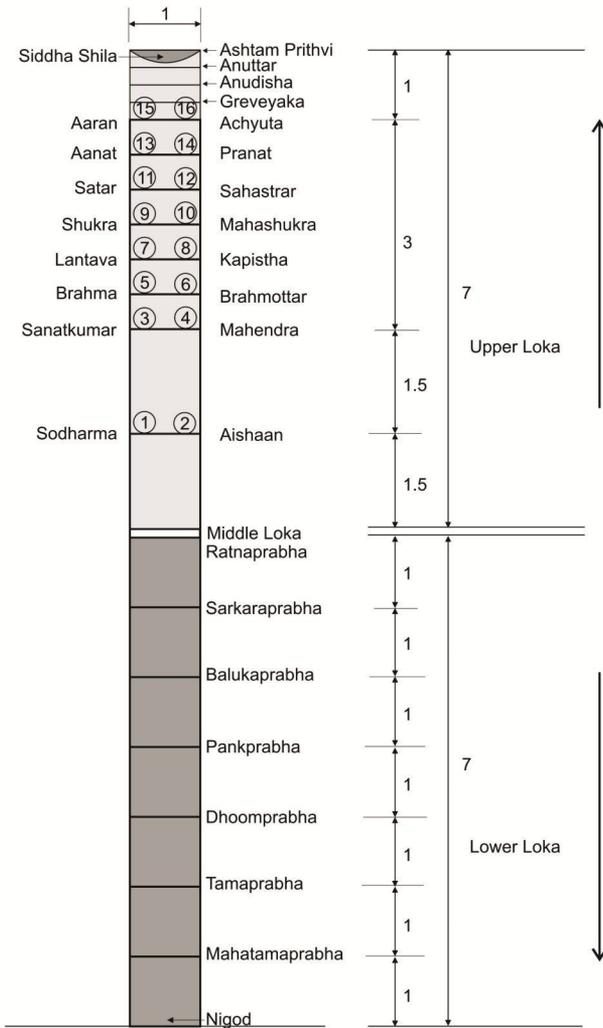


Figure 2. The Mobile Zone (*Trasanadi*) of the *loka*. Distances are in *rajju*. The heavens and hells are represented by flat lines. The space between the heavens and hells are regions in which the souls and subtle bodies of mobile beings move from the middle *loka* to the heavens and hells at superluminal speeds during migration on the change of modes. Immobile beings of the subtle type are present all over the *loka*. Liberated souls move from the middle *loka* to the *Siddhashila* almost instantaneously.

According to Jainism, there are innumerable islands, stars and other orbiting astronomical objects in the middle *loka*. The value of “innumerable,” according to Acharya Kanakanandhi, is estimated to be about 10^{140} . Even if we account for all the planets, satellites, meteorites, inter-stellar and inter-galactic moving objects, the number of islands, planets and stars in the Jain system appears to be many orders of magnitude greater than the expected number of astronomical objects in the scientific universe. Further, scientific observations show that the observable universe is almost flat and is estimated to be nearly 200 billion light-years across, approximately 2×10^{22} kilometers wide. According to one estimate, one *rajju*, the diameter of the middle *loka*, is about 1.85×10^{21} kilometers; other estimates give much higher values. It is therefore reasonable to assume that the universe that science is exploring is actually the middle *loka* of Jainism, which is also flat and of comparable size. This is a very important inference because it means that science knows only about a part of the total universe, while Jainism describes the whole universe that exists.

There could be an alternative way of describing the middle *loka*. In this description, the orbiting celestial objects, including all stars, suns, moons, planets, etc., form one part that is a flat disc. Since all planets do not support the life of mobile beings, the planets supporting such life, i.e. islands, are projected into another plane to highlight their presence. This collection of planets, called islands, forms the second part, which in fact is a constituent of the first part. Jain philosophy particularly emphasizes that these island planets are where animals and human beings live. The other celestial objects have only one-sense beings. Animals are found on all islands, but human beings are supposed to exist only on the two and half islands of *Jambudweepa*, *Dhatakikhand*, and half of *Pushkaravaradweepa*. It has not been possible to correctly identify these three islands in the context of the universe known to science, but the message is clear that intelligent life like human beings exists on only a few planets. Some scholars think that our planet Earth is *Jambudweepa*. If the other two islands are assumed to be somewhere in the Milky Way galaxy, then it would mean that no other galaxy contains planets where

human beings could be found. Of course, planets in other galaxies would have animals. However, this kind of assumption must be regarded as highly speculative and there is need for further thinking and research. If Earth is *Jambudweepa*, where is Mount Meru? This, like many others, is a puzzling question. It appears that Mount Meru has been conceived to represent the central idea that all astronomical objects in the middle *loka* have an orbital motion. In the human body, “meru” means spine. The spine forms the central axis around which the body is made. Similarly, Mount Meru forms the central axis around which the structures of the middle *loka* and *Trasanadi* are formed. Is Mount Meru an imaginary concept that may not in fact have any physical existence?

According to Jain philosophy, the *loka* is beginningless but matter follows the basic rule of origination-cessation-permanence. This means that any aggregate, like a star or a planet, can disintegrate into particles and *paramanus* and such particles and *paramanus* can reassemble and aggregate to form new stars or planets. In the same way, islands are also not permanent; they may disintegrate and lose their identity. Astronomical observations confirm that this is a regular process in space: old stars and galaxies are destroyed and new stars and galaxies are formed. This may be one reason that the number of islands and stars in the middle *loka* is said to be countless, since their number is not fixed and keeps changing over time. But the overall structure of the middle *loka* remains of the same kind.

There are two other important features of the middle *lokaas* described in Jain texts: human beings are only found in a small part of the middle *loka*; and that the *Jyotishkadeva* outside this part are stationary, according to the Bhagwati Sutra. The human zone of the two and half islands is also known as *samayaksetra* or the time zone (considering *vyavaharakala*). We know that day and night on Earth is defined by the rotation of the Earth on its axis, and the year is defined by the orbital time of the Earth around the Sun. The question is, what should we understand by the statement that *Jyotishkadeva* are stationary? We know that all astronomical objects have an orbital motion. Therefore the only possibility is that these objects do not rotate about their axes.

Whether such a structure would be stable is to be examined, but it appears that the day and night system is essential for human existence. Animals with one to five senses, however, can survive in the absence of such a system. The *vyavaharakala* is measured by human beings only and has no meaning to animals, and therefore it can be assumed to be absent in the middle *loka* beyond the human zone.

13.6 Lower Loka

There are seven infernal lands in the lower *loka*, as shown in Figure 2. Starting from the top these are: Ratnaprabha (gem-hued), Sharkaraprabha (pebble-hued), Balukaprabha (sand-hued), Pankaprabha (mud-hued), Dhumaprabha (smoke-hued), Tamaprabha (dark) and Mahatamaprabha (pitch dark). The upper part of the first infernal land, Ratnaprabha, is in the middle *loka*. The second infernal land is at a distance of one *rajju* below this. Likewise, all of the infernal lands are situated at a distance of one *rajju* from each other. The Ratnaprabha has three divisions: Khara, Panka, and Abbahula. These three divisions are 1600 *yojana*, 84000 *yojana* and 80,000 *yojana* thick (axial height), respectively. The Khara division is inhabited by mansion-dwelling infernal beings (*Bhavanvasi deva*); the Panka division by demons (*Raksasas*) and Asurkaumara (*Vyantara deva*); and the Abbahula division by infernal beings (*Naraki*). Sharkaraprabha is 32000 *yojana*, Balukaprabha is 98000 *yojana*, Pankaprabha is 24000 *yojana*, Dhumaprabha is 20000 *yojana*, Tamaprabha is 16000 *yojana* and Mahatamaprabha is 8000 *yojana* thick. Different kinds of infernal beings live in each of these six lands. The first four hells starting from Ratnaprabha are supposed to be hot, with the heat increasing in the lower hells. The major part of the fifth hell is hot and the rest is cold. The sixth and seventh hells are cold, with the seventh colder. The *nityanigoda* region, containing an inexhaustible stock of inactive *nigoda* beings, is perhaps the coldest and darkest part of the *loka*. *Nigoda* beings are subtle immobile beings of the vegetation class and are the smallest of all subtle immobile beings. Innumerable *nigoda* beings share one gross body, but each being has an individual karma body and *tejas* body. The age of a *nigoda* being is only a few seconds.

13.7 Upper Loka & Celestial Beings

Celestial beings are of four main types:

- 1 Mansion-dwelling celestial beings (*Bhavanvasi deva*)
- 2 Wandering celestial beings (*Vyantara deva*)
- 3 Stellar celestial beings (*Jyotishka deva*)
- 4 Empyrean celestial beings (*Vaimanika deva*)

Only Empyrean celestial beings (*Vaimanika deva*) inhabit the upper *loka*; the other three types of celestial beings live in the middle *loka*. There are sixteen heavens (Digambara belief, 12 in Svetambara) in the 6 *rajju* region of the upper *loka*, as shown in Figure 2. After these heavens, nine *Graiveyaka*, nine *Anudisha* and five *Anuttara* celestial lands are there, within a region of one *rajju*. The region between the last *Anuttara* land and the first outer layer (*vatavalaya*) is called the Eighth Land (*Ashtama Prithvi*) and has a height of 8 *yojana*. The *Sidhashila*, or abode of liberated souls, is situated in the middle of this Eighth Land. The age, power, happiness, radiance, purity of emotions (*lesya*), purity of senses, and power of clairvoyance of the Empyrean celestial beings is minimal in the first heaven and increases as one raises to the higher heavens. The Empyrean celestial beings of higher heavens do not leave their lands (*Vimana*).

13.8 Some Special Features of the Heavens and Hells

Much of the descriptions of heavens and hells given in Jain texts appear to be of a mythological nature, but from these we can gain a broad picture of these lands. The Empyrean celestial beings and the infernal beings do not have a gross body like ours; they have protean bodies which are invisible to our eyes. These protean bodies are composed of a special kind of four-touch matter known as *aharavargana*. Such bodies do not require water or oxygen for living or solid land to support them; therefore, the lands in the heavens and hells do not have stars, planets or galaxies. It also means that the stars, planets and galaxies of the middle *loka* do not enter the upper and lower *loka*, implying that the objects made from *Mahaskandha Vargana* are confined to the middle *loka* only. Other *varganas* of both eight-touch and four-

touch types can travel all over the *loka*. So the lower and upper *loka* are entirely different from the middle *loka* in their structure.

The movement of heavenly and hellish beings has different limits. The beings in the higher heavens (*deva*) can travel through the heavens of a lower category, but the beings in a lower heaven cannot travel to a heaven of a higher category. Similarly, in the case of hells a being in a lower hell cannot travel to a hell of a higher category, but a being in a higher category hell can travel through a lower category hell. Further, the infernal cannot enter the heavens and the Empyrean beings do not travel to the hells.

The *nityanigoda* region at the far end of the lower *loka* is of yet another special kind. The *nigoda* beings can go out of this region, but no being from any other part of the *loka* can enter it. On the other hand, the *Siddhashila* at the far end of the upper *loka* is the place where only a pure soul can enter but does not leave. *Nigoda* beings can move in and out of this *Siddhaloka*.

The Empyrean beings can travel to the middle *loka* and have the power, known as *vaikreyika* power, to assume any form of their choice on any planet. For example, an Empyrean being from heaven can travel to Earth and materialize in the gross form of any animal or human body. The protean bodies of Empyrean and hellish beings do not undergo an aging process. The aging process is only characteristic of bodies composed of solids and liquids. The Empyrean and hellish beings have an *upapada* type (spontaneous) birth; that is, they instantaneously assume their full form on birth and retain this form until their death, without aging.

The Empyrean beings are supposed to live on *vimana* (some kind of aerial subtle structure). The *vimanas* are also a source of brightness and can move freely in space like clouds. The infernal are supposed to live in holes (i.e. cells). That is, their movement through their lands is very limited; they are confined to the space of their small cell. This may also be indicative of the type of lands existing in these regions. The lands of the upper *loka* favour movement of beings whereas the lands of the lower *loka* offer resistance to movement.

The souls having more merit karma than demerit karma take birth in the heavens. Merit karma is composed of lighter *karmanvarganas* with a negative charge. The lands of the heavens attract these meritorious souls, so they must have a net positive charge. This means that the heavens must contain a majority of positive *varganas*, and souls with demerit karma cannot enter them. Similarly, the lands in the lower *loka* must be made of net negative *varganas* that attract the souls with more demerit than merit karma. Demerit karmas are made of the heavier, positive *karmanvarganas*. Such souls cannot enter the heavens that are made of positive *varganas*. It is interesting to note that the positive upper *loka* and negative lower *loka* constitute an electrical system on a cosmic scale in the *trasanadi*. The mobile zone region may in fact work as an active electrical system with a positive pole in the upper *loka* and a negative pole in the lower *loka*. This may have an important significance for the stability of the structure of the *loka*.

When the excess merit or demerit karma is exhausted by the fruition process, the karma body has an equal amount of merit and demerit karma. The soul in this state is pushed out from the heaven or hell and immediately takes birth as a human being in the middle *loka*, which is a neutral region. It may be noted that to satisfy the condition of compatibility a soul leaving hell cannot be born in either hell or heaven again, and similarly a soul leaving heaven cannot be born in either heaven or hell again. This means that a human being at the time of birth in the middle *loka* has a balance of merit and demerit karma. The balance is at different levels in different souls and is the cause of the diversity of individuals we observe on Earth. The soul in the middle *loka* now further bonds merit and demerit karma, depending on its actions, and this decides the future of the soul. But this does not mean that the humans in the middle *loka* cannot have unequal demerit and merit karma. They do have these types of imbalances in karma, but because of the gross body they cannot leave the middle *loka*. As soon as the gross body is left at death, the *jiva* immediately travels either to hell or heaven depending on the nature of the majority karma. So it is the middle *loka* that ultimately determines the fate of the *jiva*: for this reason in Jainism human birth is given the utmost importance out of all births, and also in other religions

and civilizations. Humans have the power and will to decide their destiny.

13.9 The Outer (Enclosure) *Loka*

The *loka* outside the mobile zone, and the inter-hell and inter-heaven spaces in the mobile zone, contains only immobile beings of the subtle type. These beings do not require oxygen to live and can exist in any part of the *loka*. This part of the *loka* is about 333 cubic *rajju* and comprises the biggest portion of the *loka*, which has a total volume of 343 cubic *rajju*. This means that the vast majority of the *loka* has only immobile beings of a subtle type and only a small fraction, consisting of the middle *loka*, hells and heavens, has mobile beings. The observable universe is again a small part of this portion. The boundary of the outer *loka* determines the shape of the *loka*. The edge of the outer *loka* has a special structure that resists the movement of *paramanu* and *varganas*.

It is mentioned in Jain texts that a *paramanu* with the maximum negative charge has the slowest velocity, when there is no other external influence. The *pudgala* near the boundary of the *lokakasa* are *Ruksa*, negatively charged particles, so there is retardation of motion in this region. As *dharmastikaya* and *adharmastikaya* are absent in the *alokakasa*, no motion is possible there.

The *loka* does not end abruptly; it is gradually thinned down in its consistency to a rarefied condition. There are three layers at the edge of the *loka*, the innermost a little dense and the outermost in a rarefied state. The inner layer is called the *ghanodadhi* (dense like water) layer, the middle layer is the *ghana* (dense like air) layer, and the outer layer is the rarefied *tanu* layer. The *ghanodadhi* layer is supposed to support the *loka*, the *ghana* layer supports the first layer and the *tanu* layer supports the second layer. The *tanu* layer is supposed to be supported by the *akasa*. The three layers have varying thicknesses at different parts of the *loka*, perhaps for the stability of the size and shape of the *loka*. These layers are supposed to contain negatively charged *paramanus* and *varganas* which retard movement as mentioned above.

If the *loka* is viewed as a cricket ground, then the pitch can be compared to the mobile zone where the mobile *jiva* is running about

according to its karma. The human zone in the middle *loka* is like the cricket ball placed at the center of the pitch; our planet Earth is just a point in this ball. The *jiva* does go out of the pitch and in its journey it scans the entire field at some point of time.

13.10 Comparison and Discussions

Jain philosophy admits an eternal, finite *loka* of a well-defined (*supratisthita*) shape at all times. The Big Bang Theory, which proposes the creation of the universe at a particular event and the universe's continuous expansion, is opposed to the Jain concept. The Big Bang Theory also assumes that space and time came into being at that instant, whereas in Jainism space is eternal and has always been in existence. *Akasa* is a *dravya* (substance) that can be neither created nor destroyed. Then how can the Big Bang Theory describe reality? The time referred to in this theory, and in the scientific world in general, is Jainism's empirical time (*vyvaharakala*) that measures the time elapsed since an event. Empirical time is not a substance and it does not have the same conceptual standing as space, which is a substance. This means that the concept of space-time does not describe a combination of two substances (space and time), but a combination of the space substance with a time measuring standard. Empirical time is defined with respect to the movement of a physical object, usually astronomical, and is relevant to the material world only. In the theory of General Relativity, when space-time is correlated to matter no conceptual inconsistency is involved. But the relationship between matter and space-time is only a partial description of reality, as it does not account for the presence of *dharmastikaya* and *adharmastikaya*, the two substances essential for motion. These limitations must be borne in mind when reviewing the mathematical theory of the universe. Further, the *jiva* is an active substance that interacts with matter, but it is not considered in the mathematical theories.

The inflation theory is a follow up to the Big Bang Theory and is equally questionable. The theory of chaotic inflation that requires the continuous generation of matter and space is more like fiction than reality. None of these theories are supported by Jain philosophy. However, the fact that the universe could consist of separate regions,

which may also be called a multiverse, each with a distinct character, is described in Jain philosophy.

We have seen that the different parts of the *loka* (like the lower, middle, and upper *loka*) are different in many ways. They differ in structure as well as in living conditions for the *jiva*. It may be noted that the universe must be described in consideration of both matter and *jiva* as two interacting substances and not matter alone as is the case in science. In the following discussion, I will describe the *loka* with respect to these two major aspects, i.e. the physical structure and the living conditions for the *jiva*.

Dharmastikaya and *adharmastikaya* are supposed to determine the size and shape of the *loka* in Jain philosophy. It is stated in the Bhagwati Sutra that the shape of the upper, middle and lower *loka* is due to *dharmastikaya* and *adharmastikaya*. These two substances are supposed to be present in different measures in the three parts of the *loka*, and their variation decides the shape and size of the *loka*. We know that the movement of beings in the lower *loka* is restricted, indicating a major presence of *adharmastikaya* there. The beings in the upper *loka* move freely in space, indicating the major presence of *dharmastikaya* there. So we can infer that the presence of *adharmastikaya* is dense in the lower *loka* and gradually reduces as we move towards the upper *loka*. On the other hand, *dharmastikaya* is dense in the upper *loka* and gradually reduces as we move towards the lower *loka*. The two substances are likely to be present in equal measure in the middle *loka*, where the cross section of the *loka* is at a minimum.

There is mention in Shatkhandagama (Vargana Khanda) that *pradesas*, and parts, of *akasastikaya* bond with each other. Similarly, there is bonding between the *pradesas*, and parts, of *dharmastikaya* and *adharmastikaya*. Also, the *pradesas*, and parts, of *akasastikaya*, *dharmastikaya* and *adharmastikaya* mutually bond. We already know that two *dravyas jivastikaya* and *pudagalastikaya* have affinity to bond with each other. Now we see that the rest of the three *astikayas*, i.e. *akasastikaya*, *dharmastikaya* and *adharmastikaya*, all of which are non-physical, form a group that has the property of bonding mutually. This

kind of bonding may have important implications on the structure and stability of *loka* and this need to be carefully studied.

On the basis of living conditions, we can divide the *loka* into six major divisions:

1. *NityaNigoda*. In this part of the *loka* that has infinitely infinite *nigoda* beings, the *jivas* are present from beginningless time and are immobile, having negligible activity (due to their very short life span). This region is a storehouse of inactive *jivas* and is intensely dark and cold. The size of this region is much larger than the size of the middle *loka*, the observable universe. This region may have the highest negative charge in the *loka*.
2. The Hells. There are seven hells with varying living conditions. Living conditions are the least unfavourable in the first heaven just adjoining the middle *loka*. The adversity of conditions, and hence the pain that the *jivas* experience, gradually increases towards the lower hells and is at its highest level in the seventh hell. The darkness in the hells increases in the same order, with the seventh hell the most dark. The hells are negatively charged spaces with a varying intensity of charge, and the intensity increases in the higher hells. A soul with a positively charged karma body travels to the hell where there is equilibrium between the charge of the karma body and the charge of the hell. For example, a soul with the highest possible demerit karma would travel right to the seventh hell and a soul with the least demerit karma shall only travel to the first hell to satisfy the equilibrium. From this point of view, the hells can be divided into seven regions with different living conditions.
3. The Middle *Loka*. The *jivas* in the middle *loka* have a mix of pleasurable and painful experiences; its regions are marked by both light and darkness. The middle *loka* has a special place in the *loka*; it is here that the *jiva* can exercise free will, engage in spiritual activities, and make efforts to attain the state of omniscience that leads to liberation. The *jivas* in the lower and upper *loka* cannot obtain liberation; they must necessarily be born into the middle *loka* before attaining liberation. The middle *loka* is an electrically

neutral place. This fact is also confirmed by scientific opinion, according to which the observable universe is supposed to have no net charge.

4. The Heavens. The heavens are the places where beings experience pleasures of varying degree. There are 16 heavens and three upper heavens, as shown in Figure 2. The degree of pleasure increases from the lower-level heavens to the higher-level heavens, and is highest in the upper heavens at the far end of the upper *loka*. All of these heavens are well lighted, but the light is of a different kind, as there are no stars. The brightness of the light increases from the lower to higher heavens. The lighted conditions exist all the time; the system of day and night is absent there. From the point of living conditions, the heavens can be divided into 11 regions (8 pairs of heavens and 3 upper heavens). The heavens are positively charged spaces, with the intensity of the charge increasing in the higher heavens. A *jiva* travels to the heaven in which the equilibrium condition is satisfied, as explained above for the hells.
5. The *Siddhashila*. This is the abode of the liberated souls with no karma body. Since liberated souls are non-physical, any number of them can occupy the same space. No other life besides *nigoda* beings is found in *Siddhashila*; even *devas* from the neighbouring upper heaven, having a karma body, cannot enter it. This is the brightest part of the *loka*. Liberated souls experience infinite bliss and have infinite *jnana* and perception power of all times, past, present and future, i.e. the concept of empirical time does not apply to them. What is the electrical charge of the *Siddhashila*? This space may have the highest positive charge, maintaining the trend of increasing charge in the upper *loka*. The maximum merit karma of a soul is such that it finds equilibrium in the 11th region and does not move into the *Siddhashila*. For a liberated soul, it is immaterial whether the space is charged or not.
6. Outer (Enclosure) *Loka*. The vast expanse of the enclosure *loka* contains only immobile beings of subtle type and is supposed to be completely dark, i.e. without light. This is the biggest region of the *loka* and has very little activity. *Nigoda* beings have demerit karma;

their karma body is positively charged. So the outer *loka* must be a negatively charged space. This kind of space would also retard motion and favour a finite *loka*.

The stars, planets, moons, and therefore galaxies, exist in the middle *loka* and not in the upper and the lower *loka*. Why cannot these celestial objects move to the upper and lower *loka*? This is perhaps due to the distribution of *dharmastikaya* and *adharmastikaya*. Their equal proportions in the middle *loka* appear to permit the existence of dense structures like stars, planets and moons. It appears that such dense structures cannot exist in a place where these two substances are present in unequal proportions, which happens in the upper and lower *loka*. This means that *dharmastikaya* and *adharmastikaya* have an important role in determining the structure and shape of the *loka*. Another possible cause is the neutral nature of the middle *loka* and the electrically charged spaces in the upper and lower *loka*.

In this manner, the *loka* can be divided into six major divisions with a total of 22 regions of different characters. These regions, separated by great distances, provide a multi-region, or multiverse, structure of the *loka*.

13.11 Some Specialties of Non-gravitational Subtle Matter

Another important aspect concerning the structure of the *loka* is the presence of non-gravitational subtle matter. We mentioned above that this class of matter comprises the associable and non-associable *varganas*. We do not know much about the non-associable *varganas*, but information on the associable *varganas* is available in Jain texts. These *varganas* are of five types: *aharavargana*, *taijasvargana*, *bhashavargana*, *manovargana* and *karmanvargana*. *Aharavargana* constitutes the protein bodies of the infernal and celestial beings; *tejasvargana* constitutes the *tejas* (energy) bodies of all beings; *bhashavargana* provides the medium for speech and its transmission; *manovargana* forms the minds of human beings and other five-sensed animals; and *karmanvargana* constitutes the karma (information) bodies of all beings. All beings in the mundane state have *karman* bodies, made from *karmanvargana*, and *tejas* or *prana* bodies, made from

tejasvargana. We can infer the properties of *tejasvargana* from the performance of humans.

Prana is an electric force. All physical and mental activities in humans are due to the *prana* force. This force can act against gravity. Yogis work wonders with the help of *prana* energy. Yogis can increase the *prana* energy in the body by practicing *pranayama* and other yogic exercises. In general, there are three kinds of forces acting on the body: gravity that pulls the body down and keeps it on the ground; biological forces that cause movement in the body; and the *prana* forces. With the help of biological forces, generated due to metabolic activity in muscles, and acting through the bones, we can lift our limbs up against gravity. This makes walking possible. Jumping may not be possible purely by biological forces; it needs additional upward force, and this is provided by the *prana* energy forces that act against gravity. So an athlete practicing jumping has to muster enough *prana* force for his act.

An increase in *prana* energy in the body can accomplish other feats. For example:

1. Yogic flying. Many followers of Maharishi Mahesh Yogi are seen to practice yogic flying, in which their bodies are lifted up for a short time and the practitioner jumps a small distance in sitting posture. This is supposed to become possible after the practitioner collects enough *prana* energy to lift his or her body up against gravity.
2. On further increase in *prana* energy, the yogi experiences lift for a greater duration of time and he can walk on the surface of water. This has been demonstrated by many yogis. In this case, the lifting force of *prana* energy equals the force of gravity on the body.
3. With a still higher level of *prana* energy, a yogi can fly in the air, a feat that is rare. In this case, the lifting force of *prana* is greater than the force of gravity on the body.

In all of these cases the *prana* energy is stored in the body space and the body experiences the forces acting on this space. The inference to be drawn from these observations is that the *tejasvargana*, *prana*, can

produce a force that acts against gravity or has an anti-gravity property. Another feature of *prana* is that it can travel at astonishingly high speeds. It is mentioned in Jain texts that a soul with a *karman* and *tejas* body can move, on death, from the middle *loka* (say Earth) to any heaven or hell in a maximum time of four *samaya* (*samaya* is the time taken by a *paramanu* to move a distance of the size of the *paramanu* when moving at the slowest speed). This becomes possible because the *karman* and *tejas* body is gravity-free and the *prana* body applies an electric force. Like the *tejasvargana*, all other associable *varganas*, and also non-associable *varganas*, are expected to have such properties. The four-touch matter makes up a significant proportion of the total matter in the *loka*, and this has an important bearing on the structure and size of the *loka*.

A complete description of the *loka* must explain the processes taking place in the material world as well in the living world. Mathematical theories that only consider matter do predict some events in the physical world successfully, but do not say anything about living beings. They therefore do not provide a complete theory of the existence of total reality. As far as the material part of the *loka* is concerned, we find that *paramanus* and *varganas* (excluding GMV) are moving about the whole *loka*. This means that the same physical laws hold good for all regions of the *loka* and that the Levels II, III and IV of Tegmark's multiverses are not admissible.

13.12 Life-Centered *Loka*

A question may be asked as to why the *loka* exists in separate regions and not as a single homogeneous unit, as assumed by the scientific community? The argument is that the *loka* exists in a form that is appropriate for life to make its journey from the most underdeveloped state to the state of perfect knowledge. If not so, what is the purpose of the *loka*? In its journey the *jiva* passes through various stages for which suitable living conditions are required. The journey of the *jiva* is karma-based; it has to experience the fruits of its karma. To experience the fruits of demerit karma, the hells provide a suitable place. To experience the fruits of merit karma, the heavens are the suitable places. The middle

loka is the place where the *jiva* experiences the fruit of both demerit and merit karma and where it can exercise its free will and make efforts to attain the state of perfect knowledge, omniscience. All of this would not be possible if the *loka* were a homogenous place like the middle *loka*; in that case the *loka* would not serve any fruitful purpose for the *jiva*. So the *loka* has organized itself into several regions suiting the needs of *jiva*. The *jiva*, and not matter, is the main player in the *loka*.

13.13 Mathematical Model of *Loka*

A mathematical model of nature is useful in the study of this system. A comprehensive mathematical model of the *loka* must consider all the existential to arrive at a realistic result. A simplified model of the *loka* can be made based on the following considerations.

1. Presence of matter, both gravitational (eight-touch) and non-gravitational (four-touch). A suitable ratio of the two types can be assumed.
2. A uniform electric field due to the dynamic charge of *paramanus* (two-touch) extending through the whole *loka*.
3. The body of a mobile *jiva* has a continuous input and output of matter of both the gravitational and the non-gravitational types. The mobile *jiva*, therefore, can be modeled as a pair of source and sink of such matter. A uniform distribution of source-sink pairs can be assumed all over the *trasanadi*. The subtle immobile beings in the outer *loka* are a different class and do not possess this property.
4. *Dharmastikaya* and *adharmastikaya* as agents of motion and non-motion respectively. A linear variation along the *trasanadi* axis can be assumed.
5. Presence of GMV matter in the middle *loka* only, which can be assumed to be flat.
6. Presence of electrically charged spaces in the *trasanadi*, with a positive pole in the upper *loka* and a negative pole in the lower *loka*.
7. *Akasa*, space for all other components realities
8. Empirical time for measuring the duration of events.

9. Boundary conditions. The outer layers are free of life and therefore do not have eight-touch kinds of matter. These layers contain four-touch matter that can provide a force against gravity. Further, this matter is supposed to have a negative charge. Thus the overall effect of the outer layers is to retard the motion of matter and provide a force against any tendency toward expansion. So the outer layers can be modeled as a uniform force acting inwards on the boundary. Defining boundary conditions in this way effectively presupposes a finite *loka*, but this is not objectionable since most cosmologists believe that the universe could not be infinite.

As a first approximation, a two dimensional model can be made because the *loka* on axial planes is expected to be similar.

13.14 Conclusions

Mathematical theories of the universe entail the creation of substances like space or matter and violate the basic principle of Jainism that all substances are eternal: they can be neither created nor destroyed. These theories also do not describe the evolution and life of living beings, which are essential components of the universe. They are, therefore, essentially incomplete.

Jain philosophy describes the matter in detail at both the gross and subtle levels; the latter may follow some laws which are yet unknown to science. Jain cosmology posits an eternal and finite *loka* of a well-defined shape. The *loka* is traditionally divided into three parts that can be further divided into six divisions and 22 regions on the basis of *dharmastikaya* and *adharmastikaya*, the presence of *varganas*, and the living conditions for the *jiva*. The *loka* is supposed to be a multi-region structure; all regions are connected so that the *jiva* and lighter *varganas* can move across the whole *loka*. The observable universe of science is comparable to the middle *loka*; the other regions, which have a different character, are not known to science. The structure of the *loka* appears to be life-centered, i.e. it meets the needs of the *jiva* in its journey from its initial, most ignorant state to its final state of perfect knowledge. Here we see the beauty and perfection of nature that serves the purpose of the *jiva*.

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Living Systems and the Fate of the Universe (Loka)

14.1 Introduction

The creation of the universe has always been an object of human curiosity and various theories have been proposed for it. Some Indian philosophies advocate that Brahman is the Creator, but the scientific view is opposed to this kind of theory. Jain philosophy also does not accept the existence of any Creator; according to Jainism, the universe (*loka*) is beginningless and endless. The most widely accepted theory of science is the Big Bang Theory, which states that the universe came into existence with an explosion. According to this theory, the universe is continuously expanding. A theory of an oscillating universe has also been proposed, which anticipates a Big Crunch in which the universe will reduce to a dense mass from which a Big Bang will again take place. This theory supports a beginningless and endless universe, since the Big Bang and Big Crunch would repeat in a cyclic manner. The Second Law of thermodynamics predicts a heat death of the universe.

In this chapter, I examine the fate of the universe in the light of scientific knowledge and Jain philosophy. Scientific theories of the universe consider only matter and do not take account of the living systems. Without including the existence of the soul, the fate of organisms and hence the fate of the universe cannot be predicted successfully. This chapter is an attempt to examine the fate of the universe while considering both matter and soul.

14.2 Entropy and Cosmology

The Second Law of thermodynamics conventionally describes physical systems. “An important law of physics, the second law of thermodynamics, states that the entropy of any system cannot decrease except insofar as it flows outward across the boundary of the system. As

a corollary, in an isolated system the entropy cannot decrease. By implication, the entropy of the whole universe, assumed to be an isolated system, cannot decrease; in fact, the entropy of the universe is always increasing.” It has been speculated that the universe is fated to die a heat death in which all of the energy ends up as a homogenous distribution of thermal energy, so that no work can be extracted from any source.

“However, the role of entropy in cosmology remains a controversial subject. Recent work has cast extensive doubt on the heat-death hypothesis and the applicability of a simple thermodynamic model to the universe in general. Although entropy does increase in the model of an expanding universe, the maximum possible entropy rises much more rapidly – thus entropy density is decreasing with time. This results in an "entropy gap" that pushes the system further away from equilibrium. Other complicating factors, such as the energy density of the vacuum and macroscopic quantum effects, are difficult to reconcile with thermodynamic models, making any predictions of large-scale thermodynamics extremely difficult.”

Entropy has often been associated with the amount of order, disorder and/or chaos in a thermodynamic system. Entropy serves as a measure of how close a system is to equilibrium, that is, to perfect internal disorder. The value of the entropy of distribution of atoms and molecules in a thermodynamic system is a measure of the disorder in the arrangements of its particles. Solids, which are typically ordered on the molecular scale, usually have less entropy than liquids; liquids have less entropy than gases; colder gases have less entropy than hotter gases. At absolute zero, crystalline structures are approximated to have perfect "order" and zero entropy.

Mathematically, entropy S is defined as

$$S = -K \sum p_i \log p_i \quad (1)$$

The sum runs over all microstates consistent with the given macro state, and p_i is the probability of the i^{th} microstate and, K is a constant. According to this definition, highly-ordered states have low entropy and disordered states may or may not have high entropy. For a

microcanonical system where all accessible microstates have the same probability, equation (1) gives

$$S = K \ln W \quad (2)$$

Where W is the number of possible states in which a system can be found.

Some scientists have questioned the relationship between entropy and disorder. If entropy is associated with disorder, and if the entropy of the universe is headed towards the maximum, then many are puzzled as to the nature of the "ordering" process and operation of evolution. In the recent book *SYNC—The Emerging Science of Spontaneous Order*, Steven Strogatz writes "Scientists have often been baffled by the existence of spontaneous order in the universe. The laws of thermodynamics seem to dictate the opposite; nature should inexorably degenerate towards a state of greater disorder, greater entropy. Yet all around us we see magnificent structures like galaxies, cells, ecosystems, and human beings etc. that have all somehow managed to assemble themselves."

The most general interpretation of entropy is as a measure of our uncertainty about a system. The equilibrium state of a system maximizes the entropy because we have lost all information about the initial conditions except for the conserved variables; maximizing the entropy maximizes our ignorance about the details of the system. This uncertainty is not of the everyday subjective kind, but rather the uncertainty inherent to the experimental method and interpretive model.

Locally, the entropy can be lowered by external action. This applies to machines such as a refrigerator, where the entropy in the cold chamber is reduced, and to living organisms. This local decrease is, however, only possible at the expense of entropy increase in the surroundings.

14.3 Entropy, Order and Life

Some scientists draw a parallel between physical systems and biological systems. As a biological ecosystem evolves by the process of natural selection, it disperses energy, increases entropy, and moves towards a stationary state with respect to its surroundings. According to them, science does not make a distinction between animate and inanimate objects. In both cases, energy flows towards a stationary state, or a state of equilibrium, in the absence of a high-energy external source.

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." He states that life greatly depends on order and that a naive physicist may assume that the master code of a living organism has to consist of a large number of atoms. He further states "...living matter, while not eluding the 'laws of physics' as established up to date, is likely to include 'other laws of physics' hitherto unknown, which however, once they have been revealed, will form just as integral a part of science as the former." Schrödinger concludes the book with philosophical speculations on determinism, free will, and the mystery of human consciousness.

The argument of Schrödinger that life feeds on negative entropy or negentropy served as a stimulus for further research. In the popular 1982 textbook *Principles of Biochemistry* by American biochemist Albert Lehninger, it is argued that the order produced within cells as they grow and divide is more than compensated for by the disorder they create in their surroundings in the course of growth and division. Thus, according to Lehninger, "living organisms preserve their internal order by taking free energy from their surroundings, in the form of nutrients or sunlight, and returning to their surroundings an equal amount of energy as heat and entropy."

Entropy has been associated with disorder, and disorder has been linked to disorganization by some workers; higher entropy means higher disorder and also higher disorganization. But this kind of relationship has been questioned, particularly in the context of living systems. Living creatures are a significant sub-class of open systems. An individual cell continuously takes up metabolites through its enclosing membranes and this material undergoes chemical reactions within the cell, resulting in a variety of low- and high-molecular weight products. Some of these pass out of the cell; others contribute to the cell's growth and to its eventual division. It is really difficult to make an accurate entropy balance on an organism with its environment. However, the experimental evidence does not reveal any violation of the Second Law.

K.G. Denbigh has cited the example of a fertile bird's egg inside an incubator. "The incubator contains a sufficiency of air and was initially

raised to a temperature high enough for the hatching of the egg. The incubator was thereafter surrounded by perfect thermal insulation so that its total entropy can only increase or remain constant. However, there remain two possibilities concerning a different aspect of the system's temporal development: (1) the egg dies; (2) the egg lives and eventually gives rise to a live chick. Now it is true that in case (1) there is an entropy increase accompanied by a process of disorganization, localized in the egg. But the opposite is the situation in case (2): for although the egg is certainly a highly organized system, the live chick must surely be deemed to be much more so. Entropy again increases but now there is an increase in the degree of organization as well. This example provides a clear instance of its being false to suppose that entropy increase is equivalent to a process of disorganization." "This does not mean that organisms operate in a manner contrary to the second law. That is not the case at all. The irreversible processes of metabolism, heat conduction, etc., occurring within organisms are entropy-producing like any others. It is only to say that changes in the amount of organization and of entropy can occur quite independently of each other."

"A similar conclusion was reached by Denbigh about changes or "orderliness" and of entropy being mutually independent. He thinks that in addition to entropy there may well be other "one-way functions" which add to the overall description of the world's temporal development."

14.4 Nonliving Physical Systems

We know that the fundamental constituent of matter is *paramanu*. The energy of a *paramanu* can be divided into three categories for our purposes:

1. Thermal energy, described as *sheeta* (cold) and *usna* (hot) touches.
2. Electric energy, described as *snigdha* (positive charge) and *ruksha* (negative charge) touches.
3. Kinetic energy, or motion.

The *paramanu* can change its energy mode spontaneously so that one form of energy changes into another. The *paramanu* does not stay in

the same mode for very long. In particular, thermal energy may change into electric energy and vice versa. So we have *paramanus* in which the electric energy is very small compared to thermal energy and also *paramanus* in which the thermal energy is very small compared to electric energy. Theoretically the cosmos can exist in three ways:

1. Thermal cosmos – a thermal system with limited electric energy
2. Electric cosmos – an electric (or magnetic) system with limited thermal activity
3. General cosmos – a system in which both thermal and electric (or magnetic) energy are important

The state of a free *paramanu* is unpredictable; it can move with different velocities, from zero to very high velocity, and can occupy any position in the cosmos. The *paramanu* is thus associated with the highest uncertainty. With the formation of clusters in a *vargana*, the freedom of motion of the individual *paramanu* is subjected to restrictions, thereby reducing its uncertainty. This reduction in uncertainty gives rise to some order in the arrangement of the *paramanus* in the *vargana*. The order is increased in higher *varganas*, which have *paramanus* in the bonded state. The order is still higher in the matter comprised of the twenty-third type of Gross Matter *Vargana*.

The bonding between two *paramanus* takes place when the difference in their electric charge exceeds a minimum level. This shows that a high electric charge (or magnetism) increases order in the system.

The processes taking place in *varganas*, including clustering, de-clustering, bonding, and separation, are spontaneous. In the lower, massless *varganas*, the *paramanus* simply cluster without bonding and de-cluster easily. The process happens randomly and is not expected to change the overall order in the cosmos. In the higher-mass type of *varganas* that are in the form of energy, bonding and de-bonding is an electrical activity that must not disturb the overall order in the system. Scientific findings show that 70 percent of the mass of the universe is in the form of dark energy. As described in the last chapter, some of the higher *varganas* may comprise this kind of energy. We therefore expect that this 70 percent does not contribute to the disorder in the universe.

The other 30 percent of the mass of the universe is supposed to come from dark and ordinary matter, about 25 percent of which is said to be dark matter. We know very little about dark matter, and our knowledge of the applicability of the laws of science is limited to the visible matter that is about 5 percent of the total. Over 99 percent of the visible mass of the universe is contained in stars and therefore their activities are important from the view of order prevailing in the universe.

The thermal processes taking place in matter are subjected to the second law of thermodynamics, which states that, in an isolated system like the universe, the entropy is always increasing. We have stated above that the universe can be regarded both as a thermal system and an electrical system and that the system can change its mode from one type to another spontaneously. This has important implications regarding the overall order in the universe.

There is scientific evidence that verifies a spontaneous change in the mode of a system. In a process known as adiabatic demagnetization, a reversible change in the temperature of a suitable material is caused by exposing the material to a changing magnetic field. "In this type of refrigeration process, a sample of solid such as chrome-alum salt in which the molecules are equivalent to tiny magnets is placed inside an insulated enclosure and cooled to a low temperature, typically 2 or 4 Kelvin. A strong magnetic field is then applied to the container using a powerful external magnet, so that the tiny molecular magnets are aligned to form a well-ordered "initial" state at this low temperature. The magnetic alignment means that the magnetic energy of each molecule is minimal. The external magnetic field is then reduced, a removal that is considered to be closely reversible. Following this reduction, the atomic magnets then assume random, less-ordered orientations owing to thermal agitation, in the "final" state. The "disorder," and hence the entropy associated with the change in the atomic alignments, has clearly increased. In terms of energy flow, the movement from a magnetically-aligned state requires energy from the thermal motion of the molecules, converting thermal energy into magnetic energy. Yet, according to the second law of thermodynamics, because no heat can enter or leave the container, due to its adiabatic insulation, the system should exhibit no

change in entropy. The increase in disorder, however, associated with the randomizing directions of the atomic magnets represents an entropy increase. To compensate for this, the disorder (entropy) associated with the temperature of the specimen must decrease by the same amount. The temperature thus falls as a result of this process of thermal energy being converted into magnetic energy. If the magnetic field is then increased, the temperature rises again.”

The above example of adiabatic demagnetization shows that:

1. Thermal and magnetic energy can mutually interchange spontaneously in an adiabatic system.
2. The order in the system depends on both thermal and magnetic energy.
3. At a low temperature, thermal and magnetic energy have opposing effects on ordering.

These observations, though made under specific conditions, do support the hypotheses of Jain philosophy that the universe can be regarded both as a thermal and an electrical (or magnetic) system, and that the overall order in the universe is jointly determined by these two modes.

14.5 Living Systems

Living systems are characterized by the presence of a soul. We know that in the development process the soul initially exists in an impure state and takes birth as a one-sensed being. At this stage the soul can take birth anywhere in the universe, making its occurrence highly uncertain. From this point of view, life as a one-sensed being is a highly disordered system. As the soul develops and progresses on its journey, the regions and scope of its birth are subjected to restrictions and uncertainty is reduced while order is increased. Finally, when the soul is liberated after having taken innumerable forms of all types of beings, the soul cannot take birth again and uncertainty is reduced to zero, giving a perfectly-ordered system. Thus life in the universe proceeds temporally from a highly-disordered to a perfectly-ordered system.

The above hypothesis is supported by the history of the evolution of species on Earth. The biodiversity found on Earth today is the result of

4 billion years of evolution. Until approximately 600 million years ago; all life consisted of bacteria and similar single-celled organisms. The cell structure was prokaryotic, i.e. cells had no well-defined nucleus. More complex creatures arose sequentially after this prokaryotic beginning, first eukaryotic (nucleus-containing) cells perhaps about two billion years ago, and then multi-cellular organisms about 600 million years ago. These were, within the animal kingdom, followed by the invertebrates. Then, in sequence, we saw the age in which fishes came into existence and dominated, then the age of reptiles, the age of mammals and finally came humans. The complexity of DNA increased through these sequences, starting from the simple DNA found in a virus to the highly developed DNA in humans. The structure of DNA can be considered representative of the order in the living being, and we find that the evolution of life on Earth has proceeded from disorder to order. Some scientists are of the view that this order in the world must be the result of intelligence (or an intelligent being).

In recent years, scientists have applied information theory to biology, and in particular to the genetic code. The amount of information in the DNA of even the single-celled bacterium E-Coli is vast indeed. It is greater than the information contained in the books in any of world's largest libraries. The discovery that life, in its essence, is information inscribed on DNA has greatly narrowed the question of life's origin. Order with low informational content does arise by natural processes. However, there is no convincing experimental evidence that order with a high informational content can arise by natural processes. Indeed, the only evidence available is that it takes intelligence to produce high informational order.

DNA is an organic superconductor that can work at normal temperatures. Artificial superconductors require very low temperatures of between 200K and 140K to function. All superconductors are able to store light and thus information. This is a further explanation of how DNA can store information. Another important discovery is that all living systems emit a weak light current of photons, called biophotons. Some scientists believe that this weak bio-photon current may well suffice to take the role of regulating the whole biochemistry and biology

of life. This light results in properties like the high efficiency of energy transfer and transformation, which often approaches 100 percent; the ability to communicate at all levels within cells and between cells; the organization of metabolic activities within the cell; the operation of the immune network; and host of other biological functions. The biophoton is trapped and reemitted by DNA, which undergoes physical resonance.

The above scientific information helps us to understand how life proceeds from disorder to order. First, some scientists also find it necessary to believe in the presence of intelligence, which we know is the property of the soul. Second, the amazing structure of DNA, which is like a superconductor and holds large amounts of information, and a weak light that allows DNA to accomplish feats like 100 percent energy transfer and transmission efficiency, the superb organization of metabolic activities in the cell, etc., are all features which minimize the increase of entropy and maintain order in a living being. This kind of performance is not expected of nonliving matter; clearly it is the soul whose powers produce the order in DNA and organization in the cell. As the soul progresses in its journey from a one-sensed microorganism, it creates better order and organization in the higher biological systems, which are also the way evolution proceeds on Earthlike planets. After the stage of human beings, further increase in order has not been explored by science, as this falls in the realm of spiritual progress. According to Jain philosophy, order continues to increase in spiritual souls, hopefully producing improved metabolic and other biological states that are endowed with many kinds of supernatural powers. The journey of progress ends in liberation, the state of perfect order of the soul. Such a state is not possible with a physical body, which has inherent limitations: therefore, the soul drops the body at the last stage, becoming free forever. The total number of liberated souls is infinite and their number is added to as more souls attain liberation.

All organisms produce order from disorder, as has been rightly recognized by Schrödinger. They take in matter and energy from the environment in various forms and assemble them to produce the body structure. The body is maintained with a minimum increase in entropy. The processes taking place in the body are primarily electrical

and chemical, both of which are more energy efficient than thermal processes. Thus organisms are a means of producing order from disorder.

14.6 Order in the *Loka*

For arriving at a conclusion regarding the fate of the *loka*, we have to know the processes taking place in both living and non-living systems. Let us first consider the living systems of different kinds.

1. The animals (mobile) and human beings. These beings generally have three bodies: the gross body, the *karman* body, and the *tejas* body. The gross body exchanges energy and matter, *ahara*, with the environment for its survival. The body receives sunlight and other energy radiations and air through the skin (*romaahara*), breathes air and takes in food and water through the mouth (*kavalahara*). The body radiates heat and energy and excretes waste products like carbon dioxide, urine, excreta, etc. This matter which is exchanged between the body and the environment is of the eight-touch type. The *karman* body and the *tejas* body exchange *karmanvargana* and *tejasvargana* with the surroundings, and this matter is of the four-touch type. The change of entropy and order in the living system depends on the processes taking place in the body. As discussed above, these processes are highly efficient and produce order in the system. Further, as these processes are mainly chemical and electrical, the increase in entropy due to the body system should be very limited. The processes taking place in the *karman* body and the *tejas* body are of an electrical type and do not contribute to the entropy increase.
2. Infernal and celestial beings. These beings have a protean body, *karman* body and *tejas* body, all of which are made of four-touch matter. The processes taking place in all three bodies are of an electrical nature, and therefore the infernal and celestial beings do not contribute to entropy increase.
3. Immobile beings. Immobile beings can be divided into two categories: beings with earth, water, air, and fire bodies; and beings with vegetation or plant-type bodies. Both of these categories of beings can be of the subtle and gross types. The gross types of

immobile beings are found only in the middle *loka*, and the subtle types are present all over the *loka*. The subtle types of vegetation beings are called *nigoda*. The three bodies of *nigoda* beings are supposed to be made up of special type of eight-touch *vargana* known as *Suksma Nigod Vargana*. In the case of other types of subtle beings, the gross body may be made up of eight-touch matter and the *karman* body and *tejas* body from four-touch matter. In all types of subtle immobile beings, the processes taking place in the body are not supposed to be thermal, indicating that these beings must not become the cause for an increase in entropy.

4. *Nityanigoda* beings. These are inactive beings. There is hardly any change in their *karman* body with time, and due to their extremely short life there is no major activity. These beings therefore are presumed not to contribute to an increase in entropy.
5. Liberated beings. The liberated beings are pure *jiva* substance and have no body. They cannot participate in entropy change.

We now examine the processes taking place in non-living systems in various regions of the *loka*. Suns, moons, planets, constellations and other space objects are considered *Jyotishka Deva*, Celestial beings, in Jainism. However, I consider them to be non-living objects in this analysis, for comparison with the scientific view.

1. The upper *loka*. The heavens in the upper *loka* have *vimana* type flying structures that may be constituted of eight-touch matter. The geological, thermal, atomic and other processes, which are known to take place on Earth and other planets, suns and other celestial objects, do not take place in the heavens. In the absence of solids, liquids, and gases, no chemical activity can also take place. The only possible activity is electrical and this does not contribute to entropy change. Hence order is maintained in the upper *loka*.
2. The lower *loka*. The structure of non-living systems in the lower *loka* is similar to that in the upper *loka*, except that the first four hells and part of the fifth hell are hot and the rest of the hells are cold. However, in the absence of solids, liquids, and gases it can be presumed that these lands do not contribute to entropy increase.

The cold places in the hells would certainly not do so. The *nityanigoda* region is the coldest place, and does not promote disorder. Thus the lower *loka* is expected to maintain order.

3. The outer *loka*. This region containing only the subtle kind of immobile beings also does not have matter in the form of solids, liquids and gases. The low temperature there would maintain order in the region.
4. The middle *loka*. The middle *loka* contains planets, suns, moons, and other celestial structures. All types of matter, subtle and gross, are present in this part of the *loka*. It is the region where the major mass of *loka* is concentrated. By scientific studies, we know about most of the processes and activities that take place on planets, suns and moons. The processes taking place on these objects are caused by the natural properties of the matter as well as the activities of human beings.

The middle *loka* is expected to play a dominant role in deciding the fate of the *loka*, and a study of this aspect is detailed below.

14.7 Spatial and Temporal Variations in Order/Disorder in the Middle Loka

A relationship between order/disorder and quality of life can be established. Forests are order-producing systems, for they receive thermal energy from sunlight and convert it into chemical and electrical energy with the help of nutrients. As chemical and electrical systems are better ordered than thermal systems, plants produce order from disorder. The burning of fuel converts chemical energy into thermal energy and increases disorder. Atomic energy power plants convert electrical bonding energy into thermal energy and also increase disorder. A forest-based lifestyle where all of the requirements of living beings are met conserves order in the environment. From this consideration, animals do not contribute to disorder. Human beings, by burning fuel or by making use of energy resources, produce disorder, the magnitude of which increases with the increasing rate of burning as is the case with industrialization using fossil fuels and atomic energy. We know that industrialization adversely affects quality of life in various ways,

particularly through environmental pollution. As industrialization increases, a higher disorder is associated with a low quality of life and vice versa.

Jain philosophy describes in detail the quality of life in the middle *loka*. There are two types of lands: the lands of enjoyment, where life is forest-based; and the lands of action, where living beings employ various kinds of skills, perhaps including the burning of fuel. The lands of action are found only in the part of the middle *loka* comprised of *Jambudveepa* and two similar regions. *Jambudveepa* and these two lands have not been identified in the modern context. In this part of the universe there are 15 lands of action, and our planet is one of them. This means that there are 15 planets or regions in the middle *loka* where human beings employ advanced skills for living. Most of the lands of action maintain a constant standard of quality of life at different levels, but there are a few, like our Earth, which experience a temporal, cyclic change in the quality of life. We are presently passing through the descending phase of this quality cycle: that is, the quality of life is going down. This means that disorder is increasing on our planet, a fact that cannot be disputed. This downward trend is, according to the Jain calculation of cycles, is supposed to continue for about 40,000 years, when disorder shall reach the maximum level and the quality of life shall be at its lowest level. Thereafter, a reversal in the trend shall occur and disorder shall start decreasing, eventually producing conditions for a better quality of life.

In those lands of action that maintain a given quality of life, human beings must be wiser and not indulge in activities that increase disorder. As stated above, human beings are found only in a small part of the middle *loka*; in the remaining part, only animals are supposed to exist and life must be forest-based, producing no disorder. Thus the scenario that emerges is that, in most parts of the middle *loka*, living systems produce no disorder: only natural systems may disturb the balance of order and disorder. As natural systems involve electrical and chemical as well as thermal processes, there is a good possibility of order being maintained at a constant level in the middle *loka*.

The above analysis of living and nonliving systems shows that all regions of the *loka* except the middle *loka* maintain order. In the middle

loka there are some areas where disorder is created. But this happens in a cyclic manner in which disorder is replaced by order after a certain time. Thus over a period of time the conditions are restored and a steady state is effectively ensured in the *loka*. Incidentally, by this analysis we also appreciate the importance of the time-cycle described in Jain cosmology. It shows that there are cyclic changes in some parts of the middle *loka*, but that temporally the *loka* maintains a steady state and there is no possibility of the *loka* coming to an inactive condition or heat death.

From above we see that Jain philosophy allows for local variations in disorder, as we find on Earth, but that should not be a matter of alarm as far as the universe is concerned. The universe, being endless on a time scale, maintains a stable condition of order/disorder and life is maintained on a continuous basis.

14.8 Is the Universe Expanding?

The Big Bang Theory, which is widely accepted by scientists, is also predicted by the red shift given by Hubble's law based on astronomical measurements. The red shift is supposed to occur mainly due to the expansion of space, which causes emitted photons to stretch to longer wave-lengths and lower frequency during their journey of millions and billions of light years. Jain philosophy offers an alternative explanation for the stretching of photons in such long journeys.

A photon is made of *varganas* of the mass category. A photon is supposed to be chargeless and so it must be an aggregate of two or more *varganas* (since a *vargana* has charge). In fact, photons of different frequency must contain differing numbers of *varganas*. These and other kinds of *varganas* of both the weightless and weighted categories are found all over the middle *loka*. These *varganas* travel in all directions at any given location. A photon traveling in space may encounter and collide with other photons or *varganas* traveling in different directions. The possibility of collision will certainly exist when travel is on a galactic scale ranging over millions of light-years. As a result of such collisions, it is expected that some of the *varganas* or parts of *varganas* or *paramanus* will be knocked off, reducing the number of *paramanus* and hence the energy of the photon. A photon with a smaller number of *varganas* or *paramanus* also becomes less dense and will occupy more

space than before. Consequently, the frequency of the photon shall decrease and the wavelength will increase when considering the travel of photons on a galactic scale. This frequency decrease can be expected to be greater with greater distances of travel and a greater number of possible collisions of photons. Thus there is no need to make an unrealistic assumption about the expansion of space to explain Hubble's law. Jain philosophy supports a steady state of the universe and rejects the concept of an expanding universe.

Akasa in Jain philosophy is real, infinite, eternal and one indivisible unit; it cannot have any expansion. The expansion of space assumed by scientists obviously raises the question: what is it expanding in? There can be no expansion without the presence of space; if space is already present, what is the meaning of expansion? Jain philosophy offers a way out of all such unrealistic assumptions. The Big Bang inferred by the extrapolation of Hubble's observations is imaginary and did not take place.

14.9 Conclusions

The active universe is comprised of two basic components, (1) matter and energy and (2) *jiva*, the living substance. The state of the universe is jointly determined by these two components. The inanimate component is bigger than the animate component. 70 percent of the inanimate component is recognized as dark energy by scientists, and not much is known about it. According to Jain philosophy, this part of inanimate energy must consist of *varganas*, which are clusters of *paramanus*, some in a bonded state and others in an unbonded state. The bonding between *paramanus* is an electrical activity; therefore *varganas* (and dark energy) are not supposed to contribute to disorder in the system.

Luminous matter, made up of one specific type of *vargana*, ultimately consists of *paramanus*, whose total energy comprises electrical, thermal, and kinetic energy. The *paramanu* undergoes self-transformation and its mode changes spontaneously. The second law of thermodynamics applies to the thermal processes of gross matter that may become a cause for increase in entropy of the universe. This is supposed to increase disorder. However, the processes that take place in the

electrical mode are seen to increase order in the system. There is a possibility of change of the matter's mode from thermal to electrical in some part of the universe, thereby producing order from disorder.

Organisms are living systems that produce order from disorder. The order and organization seen in cells is not possible in non-living systems and is surely a result of the intelligence of the soul. The soul which, in its journey, proceeds from a highly disordered to a perfectly ordered state also produces order in the body it occupies. It is because of the soul that processes in the body are highly efficient, minimizing entropy production in the environment. In most parts of the universe organisms do not disturb the order; there are only a few areas in the middle *loka* where human beings resort to activities that increase disorder. But in these areas there are cyclic changes in order and disorder (*Kala Chakra*) that help maintain a steady state over a period of time.

So we have systems producing order from disorder and disorder from order in the universe. Galaxies, star systems, cells, organisms, etc. are examples of beautiful order in the universe. The two components, living and non-living, together give a steady and stable universe according to Jain philosophy and there is no possibility of heat death of the universe.

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