

JAINA DOCTRINE OF KARMA

The Religious and Scientific Dimensions

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(Religio-Philosophical Service Institution)

55, Ravindra Nagar, Udaipur 313003

Rajasthan, India

e-mail: nlkachhara@yahoo.com

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The Doctrine of Karma deals with the laws of nature that govern the lives of all organisms. All religions and philosophical schools of thoughts in India who believe in rebirth have pronounced this as the fundamental principle that connects our past, present and future. Though all schools offer some explanation how this happens, the Jaina approach to this doctrine is unique as it is based on scientific reasoning. The Arihantas who perceived the truth in its entirety presented the details of the way in which this law operates.

The Doctrine of Karma has serious implications in our personal and social lives. An understanding of this Doctrine can improve our moral, social and ethical behavior and foster harmonious relationship at global level. Allegiance to any particular faith or belief is not necessary to understand this Doctrine. Everyone seeking self-realization will find the propositions convincing and logical.

There is a tendency now a day to question everything that is religious, firstly due to lack of understanding of the true spirit of the religious tenets and secondly the advancements in physical sciences are influencing the mind of every one. However, the religious doctrines backed by science find easy acceptance and are valued.

This book does not give a detailed account of Doctrine of Karma, for that the reader must refer to other texts on Jainism. The main objective of this book is to understand the nature and working of the Karma and Tejas bodies, and establish a correlation between the Doctrine of Karma and the existing body of scientific knowledge. To this end the basic principles of the Doctrine, as promulgated by Jainas, the concepts of energy bodies, Nadis and Chakras given by Vedic and western thinkers and the scientific principles of DNA, genome and bio photons have been reviewed. A comparative study has given a clear understanding of the structure of Karma and Tejas bodies and has shown that the scientific findings corroborate well with the religious propositions. Further, it is seen that some of the questions in the areas of genetic science and biophotonic theory puzzling the scientists have their answers in the Doctrine of Karma. No prior knowledge of Jainism is necessary to follow the book.

Doctrine of karma is an important principle governing our lives. Knowing its subtler details is interesting as well as gratifying. The fact that an automatic regulating process is working within us that keeps record of our actions, thoughts and feelings and gives reward and punishment at appropriate time for our good and bad deeds compels us to be conscious of what is right and wrong and inspires us to take right and benevolent decisions. It is hoped that this small book shall convince the readers of the scientific reality of the Doctrine of Karma and inspire them to lead a truthful life.

The study undertaken in this book is just a beginning of scientific exploration of doctrine of Karma. Further studies and research are required to know the science behind other aspects of this Doctrine. The Jaina philosophy has strong logical and scientific basis which provides deep insight into the phenomena taking place in nature and this can have important implications for scientific progress.

Acharya Shri Kanaknandi ji gurudev has been a source of inspiration to me in writing this book. Muni Mahendra Kumar ji has been very kind to go through the manuscript. I offer my obeisance to both of them. My son Vinay has helped me in composing the book. Smt Sushila Kachhara my

wife, Sanjeev and Sonia Kachhara, my son and daughter-in-law, Kamal. S. Jain and Manju Jain, my son-in-law and daughter have provided financial assistance in publication of this book.

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N. L. Kachhara

Introduction

What you sow is what you reap.

This doctrine has universal acceptance, all religions and cultures in the world believe that a person reaps good fruits for his good deeds and suffers in some way for his bad deeds. When the fruits will be obtained is not known, it may be in the near or far future. How this happens, can we know the process which is responsible for it? The answer is positive and we shall attempt to understand this process. Science has explored the laws of nature that govern the processes taking place in the physical world. Similarly, there are internal laws which govern the lives of living organism. Jainism is the only religion in the world which has explored these laws and has given an explicit description of the mechanism which inherently operates in every living being. The entire process takes place at such a subtle level that it is neither visible to the eyes nor it is perceivable by the normal intelligence of a person. Only the omniscient knows the true process that is going on in every living being continuously and uninterruptedly. This process known as the Doctrine of Karma, is the foundation of the Jain religion. The entire logic behind the Doctrine of Karma is scientific, in the sense that it is based on the cause and effect principle. The discoveries and findings of the modern science also fully support this doctrine. It is amazing to know that the discoveries made by modern science with vast knowledge of physical laws and highly sophisticated experimental facilities at its command agree with the observations made by Arihants and Rishis by their supernatural internal power of examination. The law of uncertainty says that position and velocity of a small particle like electron can not be known simultaneously but this limitation does not apply to omniscient observers. They know the reality as it exists and see the truth in its entirety. The Doctrine of Karma is based on the observations of the Arihantas and it is as true as death.

How correct was Mr. Leadbeater when he said "The way in which the Indians approach the subject, and the way in which their books are written, are somewhat the reverse of ours. They always descend upon it from above, as it were, and their great Rishis, scheming out the whole plan of the universe, say with the calm certainty of knowledge "Thus it must be." We on the other hand, approach the subject from below, and patiently catalogue fact after fact over and over again, venturing to draw our deductions only after comparing the results of varied and repeated experiments and observations. But the point which I think should be of interest to you in India is that although their observations are made from so different a direction, the results agree precisely with the statements of your ancient books, thus offering a corroboration of the religious teachings which ought specially to appeal to the younger generation, because it comes along the very line in which their thought has been trained, the line of scientific enquiry."

The Soul

To understand the doctrine of Karma we must first know about the soul and its characteristics. The soul is different from the body. It is the soul which is providing the vitality and knowledge required to make the body functional. Some people do not believe in the existence of the soul. They must ask the question why a dead body which has all the physical parts and components does not function? The answer is because the soul has left the body. It is the soul which experiences the pleasure and pain, receives signals from the outside world through the sense organs, thinks and takes decisions and provides vitality and knowledge for functioning of a machine as complex as the body. The "life" in the body is due to the soul.

According to Jaina philosophy the soul is one of the six realities that constitute this universe. The other important reality is the physical matter, both subtle and aggregate. The Jainas regarded energy also as matter, *pudgala*, more than two and half thousand years back, the science came to the same conclusion only in the twentieth century. A reality or a substance has three properties. (1) It undergoes transformation and changes its form. Each form is called a *pariyaya*. (2) It has the property of destruction, that is one form is destroyed and the other originates and (3) In the process of transformation and destruction the intrinsic nature of the reality is preserved that is its basic characteristic is permanent and is not altered. Such properties are easily evident in physical matter. For example when a substance changes its form from solid to liquid and to gas the chemical composition does not change. So is the case with the soul. The soul leaves one body on "death" and enters another body according to some well-defined rules. Here "death" only implies that the soul leaves the present body, the soul in fact does not die. The soul is immortal and only changes its form when it enters from one body to another. In this process the Karmas of the soul are carried forward to the next body and the soul lives a life in accordance with these Karmas. The Karmas are the impressions of the actions performed by the soul. We shall talk more about it later.

The soul according to Jainas has the following characteristics.

1. It is beginningless and endless. Its origin cannot be known. It is immortal and cannot be destroyed by any means whatsoever, not even by a hydrogen bomb.
2. It occupies the body like oil in a seed. That is why people confuse body with the soul, but indeed they are different.
3. The soul contracts or expands according to the size of the body. In this process of contraction and expansion the number of space points called *pradesas* of the soul remain unchanged.
4. The soul is a non-physical entity, it is known only through its ability of knowing. The soul is the knower. All the knowledge that exists in the world to day is due to the soul's power of knowing. For example, the discovery of the law of Relativity by Einstein was because of the power of knowing of his soul.
5. The soul is the basis of knowledge, perception, power and pleasure experienced by a living organism.
6. The soul is the source of innumerable kinds of power. The main powers are – power of knowledge, power of vitality or potential, and power of determination.

7. The invisible soul is known by its ability of knowing. The soul is also known by functions of the body like laughter, dancing, pleasure and pain, speech, movement, etc. Without the soul these functions cannot be performed by the body.

8. The fine subtle matter, known as Karma *Varganas* (Variform) attracted by the soul from the surroundings is converted into Karma.

9. The thoughts and actions of a person leave an impression on the soul. The impressions are recorded on the Karma *Varganas* attracted by the soul. These Karma *Varganas* constitute a material body known as Karma *sarira* or Karma body. This Karma body containing the impressions accompanies the soul when it transcends from one body to another.

10. The soul and the Karma body are always held together. The question who came in existence first is meaningless like the question of the egg and hen.

11. The soul is a non-physical entity but behaves somewhat like a physical body so long as the material Karma body is attached to it. On liberation the Karma body is dissociated and separated and the soul comes in its pure state.

12. All souls are alike except for the Karma body which differs. This means that every soul is at a different stage of development. Full development means liberation or emancipation of the soul.

The souls are of two kinds the mundane soul (*Jiva*) and the liberated soul. The mundane soul has Karma body attached to it and takes rebirth. The liberated soul has no Karma body and does not take rebirth; it is free from the cycle of birth and death. Henceforth, by soul we shall mean the mundane soul (*Jiva*).

In the absolute sense the soul has only one characteristic *cetna* or consciousness. The levels of development of consciousness of souls are different and so each individual in the world is different from others. Consciousness is the exclusive property of the soul and is not found in any other substance. All liberated souls are alike but they preserve their individuality. The liberated souls continue to have the power of knowledge and perception which, in fact, now assumes infinite proportions. That is the knowledge, vitality, pleasure, perception of a liberated soul are infinite. It has knowledge and perception of the entire universe and all its states, present, past and future simultaneously. Each liberated soul is omniscient, omnipotent and experiences infinite bliss. A liberated soul is perfect and independent and is not dependent on any other agency for any thing. The Jainas, therefore, do not believe in God, in fact, each liberated soul is God or *paramatma*.

The Karma

We shall now revert to the question, how the Karmas are formed and bonded with the soul. Let us assume that a soul has Karma body attached to it. The past impressions on the Karma give rise to *kasayas* or the passions. The passions are desires carrying feelings of love and hate or attachment and aversion. There are four main types of passions – anger, pride, illusion or deceit and greed. Based on degrees the passions can be further sub classified. These passions, introduce impurities and aberrations in the soul. The abilities of the pure soul in the form of infinite

knowledge, perception, etc, are diminished when passions are introduced. Thus a mundane soul has limited knowledge, perception, vitality and pleasure. The properties of the pure soul are said to be obscured by Karma. A Karma is known by the particular property it obscures. For example the knowledge of the soul is obscured by knowledge obscuring Karma. More is the coverage less is the power of knowing of an individual and vice versa.

A living being is engaged in some kind of activity. The action may be taken by the body, speech or mind or some combination of these agencies. These actions and accompanying passions induce vibrations in the soul. The nature of vibration depends on the type of action and the magnitude of vibration depends on the degree of passion. Two things happen due to vibrations in the soul. First, the Karma body vibrates on account of the principle of resonance. Second, the vibrating soul attracts Karma *varganas* from the surroundings. The Karma *varganas* are a kind of subtle matter energy particles assumed to be present all over the cosmos, perhaps in the form of waves. The Karma *varganas* are agglomerates of Jaina atoms but are invisible to the eyes. An atom called *parmanu*, according to jainas, is the smallest indivisible indestructible, particle of matter. There is only one kind of *parmanu* in the universe and all other material atoms and particles are aggregates of infinitely large number of *parmanus*. For example, the atoms of various elements known to science are aggregates of infinite number of Jaina *parmanus*. The Jains believe that the *parmanu* has not yet been discovered by science. We shall discuss about the nature of Karma *vargana* later.

The Karma *varganas* bonding with the soul become part of Karma body and are called Karma. This Karma is a group of specific *vargana* that carries the impression of a particular action and which form a part of the Karma body. How long, these Karma remain in the Karma body? Each Karma has a life and after that it separates out from the Karma body. The shedding of Karma from the Karma body is known as Karma *vipaka* or *nirjara*. This will be discussed further in a later section.

The shedding of Karma induces a particular *bhava* or feeling in the soul. Alternatively an individual may induce some feeling in one's self by own effort and cause the shedding of Karma. The feeling thus is the consequence of change in state of the soul. When the soul changes from state 1 to state 2 feeling originates. Conversely, the feeling can transform the soul from state 1 to state 2. This is the key for the process of emancipation of the soul.

Now consider the case when *nirjara* of some Karma is taking place. The state of the soul is changed and depending on the type of Karma a particular feeling is developed which in turn gives rise to some specific thoughts, and the person acts accordingly. The accompanying passions induce vibrations in the soul causing inflow of Karma *varganas* in the Karma body.

In this process two things happen simultaneously. First, some Karma are shed from the Karma body and second some Karma *varganas* are bound with the Karma body forming new Karma. Thus the Karma *vipak* and Karma bondage form a cyclic process as shown in fig. 1, in the same cycle there is influx and out flux of Karma. If the influx is more than out flux there is a net gain of Karma. If the out flux is more than influx a net loss of Karma takes place. Generally a person is not careful in his actions and there is a net gain of Karma. Under such circumstances a person is not able to reduce his Karma and the soul has to bear the consequences in the form of continued cycle of rebirths and suffer sorrow and misery in each birth.

A question may be asked that what is the way to reduce or completely destroy the Karma? Briefly the following ways have been suggested.

1. **Observation.** Observe the events as they occur without allowing the feelings to rise. Put up with the pains and pleasures, good and bad,

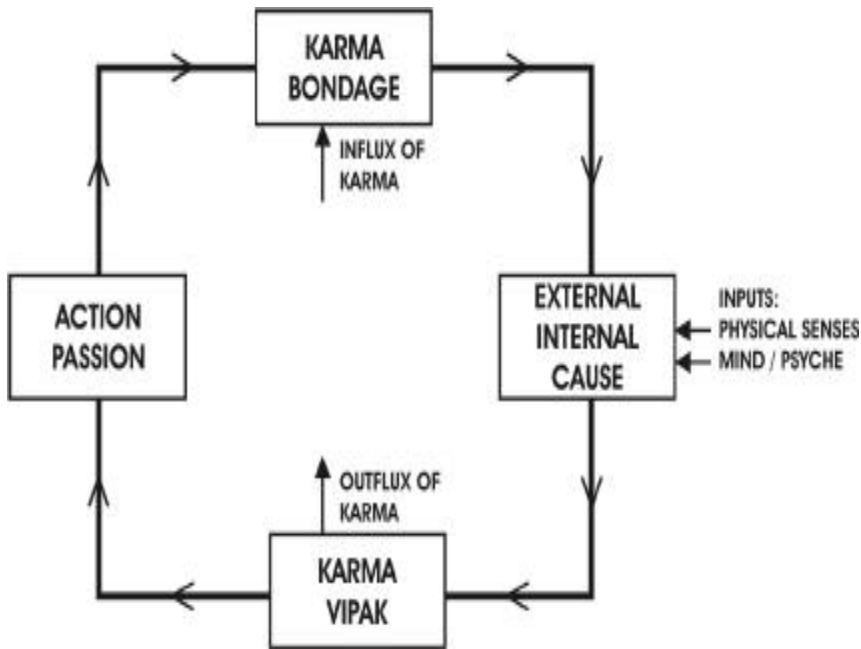


FIG.1. The Karma Cycle

favourable and adverse situations with neutral attitude without reacting

to them. Do not allow the emotion to rise, just know and observe the events as they happen. In the absence of feelings or passions new Karma will not be formed.

2. **Penance.** By undertaking penance the emotion are purified. This causes more out flux and less influx of Karma. Whatever new Karma are formed are of good type which produce pleasure and not pain on *vipaka*.

3. **Meditation.** Meditation is the best way of *nirjara*. Using the right kind of mediation the Karmas can be destroyed.

Karma Bonds

There are four kinds of Karma bonds. These bonds describe the way in which the Karma system operates.

1. **Numerical strength of Bond (*Pradesa bandh*).** A soul has innumerable *pradesa* or space points. Truly speaking the soul is indivisible but for the purpose of theoretical explanation it is assumed to have numerous space points. Numerable, innumerable or infinite number of Karma *varganas* may bond with each soul *pradesa* depending on the strength of action. If the strength of action is low, less number of Karma bond with each *pradesa* and so on. The *pradesa* bond means the number of the Karma *vargana* binding with each soul *pradesa*. The bonding is uniform over all the *pradesas*. Why such a large number of Karma *varganas* bond with each *pradesa*? This is because only infinite number of Karma can obscure the ability of the soul. Further, only the Karma in the active mode discharge this function as described below.

2. **Nature of Karma bond (*Prakriti bandh*)**. There are various types of Karma, their nature is identified by the particular property of the soul they obscure. There are eight main properties of the soul and so there are eight main types of Karma. This is an important subject and is taken up separately below.

3. **Duration of bond (*Stithi bandh*)**. A Karma remains bound to the Karma body for a given duration of time. The total duration consists of two parts passive and active duration. In the passive period called *abadhakala* the Karma exercises no effect on the soul. In the active or experience period the Karma manifests itself and the soul experiences the prescribed effect of the Karma. For example when knowledge obscuring Karma rise, the power of knowing of the soul is reduced. When the active period is over the Karma sheds and leaves the Karma body. The passive period is not fixed and varies between two limits, the minimum limit and the 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 about one or a few hours depending on the type of Karma and the maximum limit is of few thousand years.

The duration of the passive period is fixed at the time of bondage of Karma some where between the two limits depending on the strength of the passion, lesser the strength smaller is the duration. The termination of the passive period is known as Karma *vipak* or the rise of Karma. Now the Karma becomes active and gives its fruits, that is, it shows its prescribed effect on the soul. The active period is much small as compared to the passive period. After the end of active period the Karma separates from the Karma body and migrates to the surroundings in the form of Karma *vargana*.

4. **Intensity of bond (*Anubhag bandh*)**. What shall be the intensity of good or bad experience when the Karma becomes active? This depends on the intensity of the bond which is pre decided at the time of bondage of Karma. A strong passion binds high intensity Karma and vice versa.

Types of Karma

Each soul (*Jiva*) possesses innumerable qualities. In its purest natural state each soul is exactly like another and is endowed with eight main qualities.

1. *Kevalajnana* (Omniscience) Pure and perfect knowledge, the faculty of instantly cognising , by direct experience, the contents of the whole universe which contains all realities and nothing but reality, without any contradiction or discrepancy.

2. *Kevaldarsana*. Pure and perfect intuition (*darsana*) – the faculty of instantly apprehending, by direct experience, the whole of real existence, without separation of contents, as a system with total internal consistency and structure but without reference to anything beyond.

3. *Atmika Sukha*. Self – generated blissfulness which transcends pleasure / pain and joy / grief and which has no reference to anything outside the self.

4. *Ananta Virya*. Unfettered and unrestricted spiritual energy.

5. *Ksayaka Samyaktva*. Possession of complete truth.

6. *Atal – avagahana*. Eternal unchanging existence – freedom from migration.

7. *Amurtatva* – Total formlessness.

8. *Agurulaghutva* – Total parity with other pure souls.

On the other hand, all living organisms, with their souls defiled by Karma, have piecemeal and fragmented knowledge, intuition and energy, possess perverted faith and embodied existence, experience joy and grief and a limited life span and are therefore, subject to cycles of birth and death. Karma infects and defiles all worldly organisms and veils, vitiates or obstructs the above-mentioned eight qualities of a pure soul and keeps it away from its supreme state of existence. Accordingly there are eight primary types of Karma.

1. Knowledge obscuring (*Jnanavarna*) Karma obscures the pure and perfect knowledge.
2. Intuition – obscuring (*Darsanavarana*) Karma obscures the pure and perfect intuition.
3. Feeling – producing (*Vedniya*) Karma holds up the self-generated bliss and produces pleasures and pain, joy and grief (in worldly life).
4. Deluding (*Mohaniya*) Karma produces delusion – metaphysical and ethical and :
 - (a) prevents the innate ability of belief in truth.
 - (b) destroys equanimity of conduct.
5. Energy - obstructing (*Antaraya*) Karma obstructs / suppresses the spiritual energy.
6. Life – span – determining (*Ayusya*) Karma determines the biological species as well as the duration of life – span.
7. Body – making (*Nama*) Karma embodies the bodiless soul and determines the diversities and individual traits.
8. Status – determining (*Gotra*) Karma determines the status and family conditions.

Each of these primary types is divided into several sub – types. The total number of sub- types is 148.

The eight types of Karma are divided into two categories.

(a) Ability Destroying (*Ghatin*) Karma – This group destroys and distorts the innate qualities of the soul.

Four *ghatin* Karma are

- (i) Knowledge – obscuring.
- (ii) Intuition – obscuring.
- (iii) Deluding.
- (iv) Energy obstructing.

The *ghatian* Karma are further sub-divided into (a) *Sarva-ghatin* – fully destroying and (b) *Desa-ghatin* – partially destroying. Some sub-types of Karma are fully destroying kind and the other are partially destroying kind. 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 soulness and become a non-soul or non-living matter. Even as the densest and darkest cloud cannot completely obstruct the sun, exactly so the Karma cannot obscure the total ability of knowledge and truth of the soul.

(b) Ability non-destroying (*Aghatin*) Karma. This group is unable to obscure any fundamental quality of the soul but compels it to continue its worldly existence. Four *aghatin* Karma are:

(i) Feeling – producing (*Satavedniya*) and pain- producing (*Asatavedniya*)

(ii) Body – making. It has the largest number of sub- types (93) accounting for various forms of embodied existence. These Karma are described in detail below.

(iii) Status-determining. It determines the diversities of, social and genealogical status and has two sub-types – high status and low status.

(v) Life- span determining. It has four sub types which are identical to *gati-nama*- Karma viz. sub-animal and animal life, human life, celestial life and hellish life. This Karma determines the life span in each category.

Naam (Body Making) Karma

Naam Karma are the determining factors in deciding the place of birth like heaven, hell or earth, the kind of organism on earth, the shape of body of the chosen organism, different organs of the body, the body structure and look of the body, etc. There are 42 types of body making Karma having a total of 93 sub types, the largest number of sub-types amongst all the types of Karma. The next largest number of sub-types 28 is that of deluding (*mohaniya*) Karma.

The 42 types of body making Karma are as follows.

1. *Gati Naam* Karma. The 4 *Gati Naam* Karma determines the species of the living organisms, viz. (i) sub - animal (such as plants) and animal world ; (ii) human beings; (iii) celestial beings; and (iv) denizens of hell.

2. *Jaati (specie) Naam* Karma. The 5 *Jaati Nama* Karma determine the type of body of the organism viz. (i) One sensed organism; (ii) two sensed organism; (iii) three sensed organism; (iv) four sensed organism; and (v) five sensed organism. Some examples of these organisms are:

(i) One sensed organism – different kinds of trees and plants.

(ii) Two sensed organism – conch, oyster, stomach worms, etc.

(iii) Three sensed organism – Bed bugs, earthworm, louse, ants, scorpion, etc.

(iv) Four sensed organism – Bee, grasshopper, moth, fly etc.

(v) Five sensed organism – human beings, celestial beings, hellish beings, lion, elephant, horse, cow, tiger, dog, snake, etc.

3. Body *Naam* Karma. There are 5 Body *Naam* Karma which construct five types of bodies with the help of *ahara vargana*.

(i) Physical (*audaric*) Body *Naam* Karma. The physical Body *Naam* Karma enables *ahara vargava* to construct a physical body containing fluids, blood, serum, bones, flesh and marrow.

(ii) *Vaikriyika* Body *Naam* Karma. The *Vaikriyika* Body *Naam* Karma enables *ahar varganas* to construct a *Vaikriyaka* body (fluid like body) having supernatural power. This type of body is possessed by celestial beings and hellish denizens.

(iii) *Aharak* Body *Naam* Karma. The *aharak* Body *Naam* Karma enables *ahar vargana* to construct *aharak* Body. This is a luminescent subtle body used by yogis and Munis having special power for cosmic travel in order to establish contact with liberated souls and seek their guidance in difficult to solve cases.

(iv) *Tejas* Body *Naam* Karma. The *tejas* body *Naam* Karma enables yogis and Muni's having special powers to construct a *tejas* Body for some specific purpose. The *tejas Naam* Karma are also responsible for existence of a *tejas* body (electric body or vital body) in every organism.

(v) Karma Body *Naam* Karma. The Karma Body *Naam* Karma enables *Karmon varganas* to construct a Karma Body in every organism.

4. Body Bond *Naam* Karma. The Body Bond *Naam* Karma enables the atoms and molecules of a body to bond together. These Karmas are of 5 types providing bonds in five types of bodies.

5. Body Union *Naam* Karma. Body Union *Naam* Karma cause conglomeration of body matter so as to form a monolithic continuous structure of body after the atoms and molecules are bound by Body Bond *Naam* Karma. These Karmas are also of 5 types for five types of bodies.

6. Body Shape *Naam* Karma. For the type of specie of organism determined by *Jaati Naam* Karma, the shape of that particular specie is determined by Body shape *Naam* Karma. There are 6 sub-types of Body shape *Naam* Karma corresponding to six types of body shapes as under:

(i) Symmetrical Body shape (*Samchaturarsa* body)

(ii) *Nyagrodh* Body Shape. Bodies having a structure like a banyan tree.

(iii) *Swati* (Pyramid like) Body shape. Bodies having a structure like a mole tree, voluminous at bottom and thin at top.

(iv) Hunch - Back Body shape. Body having a hunch in the middle.

(v) Dwarf Body Shape.

(vi) Asymmetrical Body Shape.

7. Organ *Naam* Karma. Organ *Naam* Karma enables various organs to be formed in the body. This Karma is of 3 sub-types for the three kinds of bodies – physical body, *vaikriyika* body and *aharak* body.

8. Skeleton *Naam* Karma. Skeleton *Naam* Karma determines the skeleton structure consisting of bones and joints. There are 6 types of skeleton structures.

(i) Impenetrable and strong (like steel) skeleton structure

(ii) Very strong (like steel) skeleton structure.

(iii) Strong skeleton structure.

(iv) Mildly strong skeleton structure.

(v) Weak skeleton structure. The bones are very thin like nails.

(vi) Snake like skeleton structure. The bones are not jointed.

9. Pigment *Naam* Karma. Pigment *Naam* Karma determines the body colour of the organism. The body colours are 5 – black, blue, red, yellow and white.

10. Odour *Naam* Karma. The odour *Naam* Karma determines the odour of the body. The odour is of 2 types – fragrant and foul.

11. Flavour *Naam* Karma. The Flavour *Naam* Karma determines the flavour in the body. The flavour is of 5 types – pungent, bitter, astrigent, acidic (tamarind like) and sweet.

12. Touch *Naam* karma. The Touch *Naam* Karma determines the texture of touch of the body. The touch is of 8 types – harsh, soft, heavy, light, smooth, rough, cold and hot.

13. Migration (*Aanupurvi*) *Naam* Karma. Transit *Naam* karma determines the shape of the body in migration period between one life and the next. This shape is similar to the shape of the physical body left by the soul.

14. Compaction (*Agurulaghu*) *Naam* Karma. Compaction *Naam* Karma determines the extent of compaction of the body; the body can be heavy or light.

15. Self – Discomfort (*Opghat*) *Naam* karma. Self Discomfort *Naam* Karma produces a body structure which causes discomfort to self. For example the horns of a reindeer, large belly, etc.

16. Discomfort to others (*Paraghat*) *Naam* Karma – These Karma produce a body component which can harm others. For example poison in the mouth of a snake, sting in the tail of a scorpion, sharp nails and teeth in a lion, poison in a tree, etc.

17. Respiration *Naam* Karma. Respiration *Naam* Karma produces respiration system in the body.

18. Heat *Naam* Karma. Heat *Naam* Karma produces heat in the body so that temperature is maintained at a pre-determined level.

19. Light *Naam* Karma. Light *Naam* Karma enables bodies to produce light. This is the cause of light in a glowworm.

20. Movement *Naam* Karma. Movement *Naam* Karma enables body to move on earth or fly in sky. This is of 2 types – good looking movement like that of a lion, cow, etc and odd looking movement like that of an ass, camel, jackal, etc.

21. Sub-human and Human *Naam* Karma. This *Naam* Karma is similar to *Jaati Nama* Karma but it refers to animals and humans as a class (*trasa*).

22. *Sthavar Naam* Karma. The *Sthavar Naam* Karma determines birth as a *sthavar* organism. The *sthavar* organisms are of five kinds – (i) trees and plants, (ii) earth bodied organisms, (iii) water bodied organisms, (iv) air bodied organisms, and (v) fire bodied organisms.

23. Gross (*Badar*) *Naam* Karma. Gross *Naam* Karma determines that the body will be of gross type.

24. Micro (*Sukshma*) *Naam* Karma. Micro *Naam* Karma determines that the body will be of micro type.

25. Developed Body (*Paryapta*) *Naam* Karma. This Karma determines that the body is well developed and is not deficient in any way.

26. Undeveloped Body (*Aparyapta*) *Naam* Karma. This Karma determines that the body is under developed and is deficient in some way.

27. Solitary Body (*Pratyeka*) *Naam* Karma. A solitary body is controlled by one soul. Bodies of all organisms except some plants and vegetation are of solitary type.

28. Ordinary Body *Naam* Karma. This Karma causes an ordinary body to be formed. An ordinary body is owned by more than one soul, for example algae has ordinary body.

29. Stable *Naam* Karma. Stable *Naam* Karma ensures that the body constituents like fluids; blood, bone, flesh etc. are stable and balanced.

30. Unstable *Naam* Karma. Unstable *Naam* Karma develops a condition in which the body will fall short of one or more of the above constituents.

31. Beauty *Naam* Karma. This Karma determines that the body shall be good looking, beautiful or handsome.

32. Ugly *Naam* Karma. This Karma makes the body ugly looking.

33. Lucky *Naam* Karma. Lucky *Naam* Karma generates body conditions where luck favours. This happens only in humans.

34. Unlucky *Naam* Karma. Unlucky *Naam* Karma generates body conditions where luck does not favour. This happens only in humans. Both lucky and unlucky *Naam* Karma operate with other Karmas to produce the particular result.
35. Good Voice *Naam* Karma. This Karma makes the voice of the organism good at hearing or melodious.
36. Harsh Voice *Naam* Karma. This Karma makes the voice of the organism harsh at hearing.
37. Attraction *Naam* Karma. This Karma determines that the body of the organism shall be liked by others.
38. Repulsion *Naam* Karma. This Karma makes the body so that it is not liked by others.
39. Fame *Naam* Karma. This Karma makes the body such that others regard the organism as virtuous.
40. Defame *Naam* karma. This Karma makes the body such that others regard the organism as unvirtuous.
41. Morphology *Naam* Karma. This Karma ensures that the organs and body parts of the organism shall have appropriate size and right location.
42. *Tirthankar Naam* Karma. *Tirthankar Naam* Karma ensures that the body shall be worshipped by others as *Tirthankar*.

The Rise of Karma (Karma *Vipak*)

The Karma *vipak* or the rise of Karma has a cause. The following are the causes.

- (i) **Object (*Dravya*)**. An object can cause the rise of Karma. The object can be living or non-living. As the objects are perceived by our senses, the rise of Karma can be caused in the following ways
- a. Touch. Touch of objects such as hot and cold, soft and hard, smooth and rough, etc. may develop specific feelings in the person.
 - b. Taste. Taste of a thing which we eat or drink develops a feeling in us. Various kinds of food dishes, drinks and beverages, tobacco and drugs, etc have effects in two ways. First the immediate effect in the form of taste and second, the more important effect, takes place when they chemically act in the body system. Both these effects develop feelings in the user.
 - c. Smell. Good smell is pleasant and bad smell produces aversion and may also be harmful.
 - d. Vision. The sight of a near or dear produces a feeling of love and the sight of an opponent produces a feeling of hatred. The sight of a ferocious animal produces fear and sight of sweet – meat produces water in the mouth.

e. Hearing. Music and noise, words of love and hate, sweet and harsh words, sound of a water stream and a storm, all arouse different kinds of feelings.

(ii) **Place (Ksetra)**. When you go to a temple, cinema, vegetable market, Himalayas or a battlefield different kinds of feelings are developed.

(iii) **Time (Kala)**. Time is the agency for transformation. Chemical, physical and biological changes in the body take place with time and they produce different feelings at different times. The fruition of Karma is also time dependent. The time may become instrumental in fruition of Karma even in the absence of any feeling.

(iv) **Feelings (Bhava)**. The above three are external factors for development of feelings. There are internal factors, and perhaps more powerful, which can produce feelings of all kinds. These factors can be physical, mental or emotional.

a. Physical internal factor. The body is different from the soul but is regarded as internal considering the whole system. The physical, biological and health conditions of the body produce multitude of feelings in a person. Any deficiencies in physical structure, biological malfunctioning or disorder, ailments and illness, etc produce feeling of pain. Healthy conditions, beauty, good structure of body etc. may produce feelings of pleasure. Even our outfits and what we wear influence our feelings. Any artificial change in the physical structure and composition of the body may alter our feelings and produce a different kind of experience.

b. Mental internal factors. Our mind is never silent, it is always thinking. We notice the activities of the conscious mind only, what is happening in the sub-conscious mind are not known to us. But the activities of both the conscious and sub conscious minds influence our feelings. That is why sometimes we know the reason of our feelings and sometimes we do not. The input through the physical sense organs is only one cause of our mental activity. Even in the absence of such inputs the mind may generate thoughts which produce feeling of pain, pleasure, fear, love, hate, anger, pride, kindness, violence, attachment, greed, etc. and a person may be inclined to take a particular course of action. Our own mental environment is a very important factor for the way we behave and discharge our functions. Mental thoughts are in fact, obstructions in the path of spiritual progress and one has to find ways to circumvent this mental state.

c. Emotional factors. Emotions at times can be so strong that it may change the course of life of a person. We have well known examples of Valmiki, Angulimal, Tulsidasa, etc in history whose lives totally changed on realization of wrong doings. Emotions directly attack the Karma, strong emotions can cause significant *nirjara* and completely change the personality of an individual. Bad emotions can push the soul towards hell and good emotions can open the way to heaven. Emotions of a person are changed when self-realization of right and wrong occurs. Condemning own self for wrong doings and making a determination to reform can advance a person on the path of spiritual progress.

Destiny and Karma

Is our destiny, fate or happening in the life solely determined by Karma? The answer is a definite no. Because if it were so a soul will never come out of the Karma cycle. In fact there are five operators which determine our destiny.

(a) **The ability of the soul.** The ability of the soul is immense and no amount of Karma can completely obscure it. The soul is like a king and the Karma his courtiers. Howsoever powerful the courtiers are the king can exercise his discretion and make appropriate decision. What is needed is determination. The power of the soul is so great that if a person is determined to proceed on the path to emancipation, the Karma would go in the silent mode and wait for the onslaught by the soul. The soul with powerful action can destroy the Karmas and pave the way for liberation. This, however, should not imply that every soul can achieve this feat. Only in very rare case the determination is so strong that the might of Karma can be defeated. Generally, the Karma dictate the imprisoned king, the soul.

(b) **Circumstances.** We have no control over the circumstances. The Karma has access to the soul only. We have to adjust ourselves according to the circumstances. The Karma has no role in choosing the wife or husband, sons or daughters, meeting or departing, loss or profit, etc. Similarly the natural calamities like floods, draughts, storms, earthquakes, etc. have nothing to do with our Karma. The government policies and rules are based on considerations other than our Karma. In essence, the destruction and production of anything other than our self is governed by their own causes and is not connected with our Karma.

(c) **Time.** Time is an independent operator. It affects everything in the universe including our lives. Some events are time dependent and bear no relationship with our Karma. As a subject we have to put up with such events.

(d) **Karma.** Karma is the most important operator in our destiny. It plays the major role in deciding the course of our life. Three ways were suggested earlier to reduce the role of Karma, viz; acting as a neutral observer, penance and meditation.

(e) **Initiative.** By taking proper initiatives a person can change the course of his life which otherwise would be guided by Karma. Right initiative provides means in our hands to shape our destiny according to our will. What is needed is a strong determination, courage, untiring efforts, self – confidence energy and faith. Napoleon Bonaparte built his future by his own determination, hard work and confidence. You can be an architect of your destiny by inculcating such virtues. As per the Jaina theory the bonds of Karma can be changed by proper initiatives. It is possible to have early rise of Karma, the intensity of action of the Karma can be reduced, and the nature of Karma can be changed in some cases, etc. by taking positive initiatives. The choice is with you. All great men in the world have fought with their Karmas and won. Greatness is not a gift, it is earned by hard work, perseverance, dedication and determination. This is the way to defeat the Karma and to shape the future. In the absence of proper initiatives the Karma is the master of your destiny.

The Anatomy of the Body system

A living being commonly has three bodies – physical (*audarik*) body, *tejas* body and Karma body. The physical body can be sensed but the other two bodies, *tejas* and Karma, are invisible. The physical body is the subject of science and has been studied in great detail. The Karma body contains Karma as we now know. The *tejas* body has two important functions to perform: (1) Management of the body systems, and (2) To support and provide control on the physical body. These functions are discharged with the help of *prana* energy and other systems as described below. This life force has been called as *pranamaya kosha* by Yogacharyas and as vital body or bioelectric plasma by scientists: The *tejas* body receives *prana* energy through breathing. Obstruction in the inflow of *prana* energy stops functioning of the body systems resulting in death.

The Karma body and the *tejas* body never depart and both of them are always in union with the soul. This union is maintained till the soul attains the state of emancipation. The Karma body and *tejas* body together are referred to as subtle body (*Suksma Sarira*). The liberation of the soul is, in fact getting freedom from the imprisonment by these two bodies. The subtle body is not visible to the eyes but it has been photographed by Kirlian photography. This special kind of photography has shown that a luminous body leaves the physical body at the time of death. This luminous thing is the subtle body.

Besides the above three kinds of bodies there are also two other bodies – the *vaikriyaka* body and *aharaka* body. The *aharaka* body is employed by yogis in very special cases for some specific purpose. This body is also luminous in nature.

Figure 2 shows the schematic arrangement of the three bodies and the connections between them. The soul is at the centre of existence. Its consciousness transcends and manifests in all the three bodies. The soul vibrates under the influence of passion. The soul is completely surrounded by the Karma body and the vibrations have to pass through it. In this process the vibrations are "colored" by the Karma present in the Karma body. This means that the vibrations coming out of Karma body, known as *adhyvasaya*, possess the characteristics of the Karma which are acting at that instant. Thus the vibrations of the soul are coloured by the qualities of Karma.

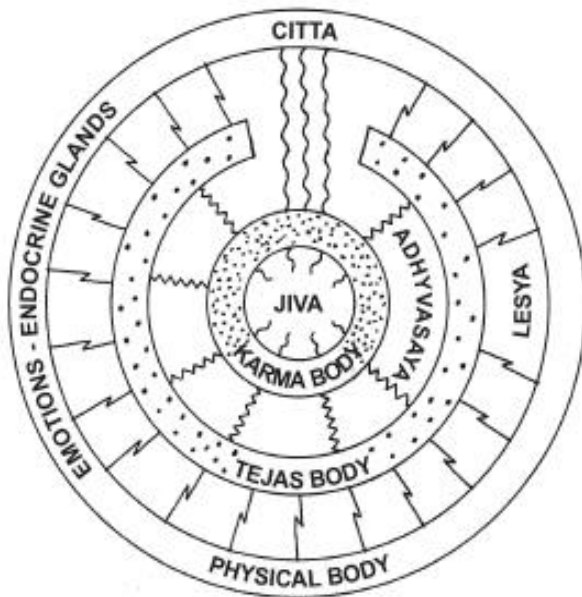


FIG.2. The three body system

The *adhyvasaya* waves now enter the *tejas* body. On interaction with the *tejas* body the *adhyvasaya* are transformed into another kind of waves called *lesya*. The *lesya* are color sensitive and produce *bhava* or feelings in us. Some of the *adhyvasaya* bypass the *tejas* body and directly enter the brain in the physical body. The interaction of *adhyvasaya* with the brain produces *citta* which is the physical imprint of all our past memories and impressions.

The *adhyvasaya* themselves form the subtle *citta* and comprise of the following four divisions (1) Non-righteousness or perversity (*mithyatva*) (2) Non-restraint (*avirati*), (3) Non-vigilance (*pramada*) and (4) Passions (*kasaya*). These *adhyavasayas* make up our personality. The non-righteousness develops distorted vision so that we are not able to see the things in the right

perspective. The non-restraint character develops desires in us which produce greed and greed based habits. The non-vigilance aspect of the *citta* develops attachment or delusion. These are all our internal creations and have no relationship with our physical body, brain or mind. These characteristics originate from *adhyasaya* or Karma and manifest in the physical *citta* or the brain. The mind now works in accordance with this *citta*. The mind is not the source of our thoughts but is only a mouthpiece of the subtle *citta*.

Adhyasaya are present in all living organism. The mind is developed in human beings and some other five –sensed beings. The *adhyasaya* discharge the functions of mind in rest of the living organisms. *Adhyasaya* are the means of harvesting the knowledge of the soul. The body cells, according to science are the source of knowledge in living organism who do not have brain or mind. This implies that *adhvasaya* present in the body cells are the source of knowledge. These *adhvasaya* may be pure or impure. In case of impure *adhyasaya* the organisms without brain or mind can also have bondage of Karma. This happens in some plants and in organisms having one, two, three or four senses.

The *lesya* produce feeling which interact with the endocrine glands and influence the secretion of hormones. The hormones mix with the blood and reach the nervous system and the brain which manage and control our, emotions, thoughts, speech, conduct and behaviour. Thus the Karma acting through *lesya* and hormones determine our personality and traits. The endocrine glands provide a transformer that establishes connection between the subtle body and the physical system. These glands thus convert the signals of the soul into chemicals which finally control the body and mind.

Our feelings and emotions are products of *adhvasaya*. Our thoughts are based on our feelings and emotions and do not have independent existence. Thoughts rise and subside with feelings. We can exercise control on our body, mind and speech but the feeling are beyond our control. The *bhava*, in fact, need purification and refinement, once purified there will be no need of control.

Lesya provide connection between the subtle body and the physical body. They work in both directions. They pick up the signals from the soul through *adhvasaya* and produce our feelings and through it transmit the message to the mind and body. On the other hand whatever is performed by mind, speech and body is communicated by *lesya* to the Karma body. Thus the entire communication between the subtle body and the physical body is through *lesya*.

The *lesya* are of two kinds – *dravya* (physical) *lesya* and *bhava* (non-physical) *lesya*. The physical *lesya* are waves and the *bhava lesya* are aberrations of the soul. The physical *lesya* in the form of waves have colors and are classified on that basis. There are six main kinds of *lesya*.

(1) *Krishna lesya* – Color is dull blackish

(2) *Neel Lesya* – Color is dark blue

(3) *Kapot lesya* – It has pigeon like color.

(4) *Tejo Lesya* – Color is bright red.

(5) *Padma Lesya* – Color is bright yellow.

(6) *Shukla Lesya* – Whitish bright color.

Each kind of *lesya* represents some specific qualities in a person. The first three types are the malevolent *lesyas* and indicate negative qualities. The last three types are benevolent *lesyas* indicating positive qualities in a person. A person can have different *lesya* at different times depending on his current *bhava* but only one *lesya* is present at any time. Human beings and animals can have all the six *lesya*. Hellish beings have only malevolent *lesya* and celestial beings have only benevolent *lesya*.

Lesya are influenced by colors. Colors have a profound effect on our feelings and thoughts. Psychologists can assess the characteristics of a person based on his liking for color.

The Energy Bodies and Aura

We have stated earlier that the Tejas body is always attached to the soul and performs two important functions viz. management of the body systems and providing support and controls for the same. What is the structure of tejas body and how these functions are performed is not clearly spelt out in Jaina books. A concept parallel to *tejas* body was developed in India by Vedic Rishis, in the form of *panch* (five) *kosha*, and latter by western thinkers as energy bodies. We briefly review these concepts here and observe that there is considerable similarity between *tejas* body and energy bodies.

Five *Kosha* – Rishis discovered that a human being has five subtle bodies or *kosha*. These *kosha* are generally in under developed condition, but can be developed by yogic practices. In the developed state these *koshas* produce many abilities in the person. The five *koshas* are *annamaya kosha*, *pranamaya kosha*, *manomaya kosha*, *vigyanmaya kosha* and *anandmaya kosha*. A developed *annamaya kosha* promotes good health, long life and long lasting youth. A developed *pranamaya kosha* produces courage, valour, bravery, genius and splendors in the person. The personality becomes magnetic and the scope and power of personal influence is increased. Awakening of *manomaya kosha* enhances the wisdom, foresightedness and intelligence of a person and he is able to maintain balance and patience during ups and downs in life. A developed *vigyanmaya kosha* makes the person gentle generous, open hearted, angel like. In the advanced stage of development a person acquires special abilities, like super natural powers, telepathy and clairvoyance. When the *anandmaya kosha* is developed the thoughts and actions of a person reach a level where he continuously experiences bliss and peace of highest order. He is now above all worldly affairs and enjoys heavenly conditions in this very life.

The western thinkers have described the Human Energy Field or the Aura. According to them the Human Energy Field is a complex combination of overlapping energy patterns which define the unique spiritual, mental, emotional and physical makeup of an individual. According to one school of thought a five – layer energy body system describes the Human Energy Field. In this system the physical body is counted as an energy body since all matter is ultimately made up of energy. Also of importance is the fact that the higher subtle energy bodies overlap and interpenetrate the physical body. In much the same way as many different TV signals exist around us in the same space simultaneously and can be individually identified by a specific frequency, the overlapping subtle energy bodies (which are also defined by different frequencies) also penetrate into the same space as our physical body. The five energy bodies are:

1. **The Physical Energy Body.** The physical body is the densest form of energy that our soul uses to explore its environment and interact with other. By the densest form, it is meant that the vibration patterns of the physical body are of a frequency low enough to be seen by our eyes (they are within the spectrum of visible light), heard by our ears

(about 30 to 15000 hertz), and experienced with the senses of touch, taste and smell which are within the "frequency compatibility" of our physical body.

2. The Etheric Energy Body. The etheric body is the first energy body having frequency above the physical body. It exists within the physical body, and extends outwards about an inch outside the skin of the physical body. Its purpose is to form an energy template or matrix for the development, maintenance and repair of the physical body. The etheric body contains a vibrational energy counterpart for each organ, blood vessel and bone found in the physical body. Indeed, the etheric body contains the energetic blueprint for the pathways that guide the location and development of every cell of the physical body. Our physical bodies exist only because of the vital (etheric) field behind them. This etheric field exists prior to, not a result of, the physical body.

Since the etheric body is the physical body's blueprint, the two are very closely related. The energetic vibrations of the etheric body determine the pattern for not only the physical tissues and organs, but also the state of health of those tissues and organs. If the vibrations are not clear and pure, this disharmony will be reflected in the physical body as disharmonious function – what we call disease. An illness can appear in the energy field weeks and months before it appears with physical body.

3. The Emotional (Astral) Energy Body. The emotional body contains the emotional patterns, feelings and vibrations that determine our personality, and also how we feel about ourselves and interact with others. If we are constantly angry, always feel helpless, or are consistently fearful, these patterns or vibrations get locked in our emotional energy field and become a part of our personality. This determines to a very large extent how we interact with others on personal, social, and cultural levels.

The emotional body generally follows the shape of the physical and etheric bodies, but is somewhat more amorphous and fluid, and extends from one to about three inches outside the physical body. It contains energy "blobs" of all colors of the rainbow, depending on the specific feeling or emotion. Highly charged feelings such as love, hate, joy, and anger are associated with energy blobs that are bright and clear, while confused feelings are darker and muddier.

4. The Mental Energy Body. The mental body contains the structure and patterns of all the thought and belief systems that we consider as true. And there is very strong, connection between the mental and emotional bodies. Although a thought or idea can in itself be very powerful, our reactions to those thought carry even more energy, and different people will react differently to the same thought.

The mental body usually appears as yellow light radiating around the entire body from head to toe, and extends from three to eight inches beyond the physical body. Within this area, individual thought form appear as small blobs of light of varying form and intensity.

5. The Spiritual (Causal) Energy Body. The spiritual body (i.e., all vibrational patterns is octaves higher than the mental body) contains all the information related to our experiences, and reflects our consciousness of all that has been learned and experienced. It contains our higher intentions, our sense of what is right and wrong ("conscience"), and our desires to increase our awareness of our purpose, place and mission for this lifetime.

The five energy bodies make up one's Human Energy Field, or aura. Its outer shape appears roughly egg shaped and extends out to perhaps 1 ½ to two feet beyond the physical body; however this shape can be extended even further or contracted closure to

the physical body depending on the situation the person is experiencing. For example when a person is feeling emotions of unconditional love, the aura may extend to several feet and radiate bright hues of gold or white. But if the same person is feeling threatened physically or emotionally, the entire aura may collapse to a much denser pattern within only a few inches of the body.

DNA and Genome

Prana energy operates in the body as an open system, which is not limited to the body's physical, mental or emotional systems. As we breathe, *prana* is drawn into the nose and is distributed into the body by specific unseen channels called Nadis. There is the main Nadi system which connects the 7 major Chakras (consciousness centers) to each other and 72000 other different Nadis. The 72000 Nadis are divided into 2 different types of channels:

- 1) The invisible channels which are the channel mind.
- 2) The visible channels which includes the nerves, muscles, arteries, veins, cardiovascular system, lymphatic system and the acupuncture meridians in the body.

The Chakras work with both visible and invisible energies. The 7 major Chakras reside and work in the cerebrospinal (brain-spine) system inside the spinal column and are connected to the main Nadi system (*Shushumna*). This is where the Chakras control the functioning of the entire body.

The *Shushumna* is centrally located and is the only Nadi that passes through the spinal column. This main Nadi system is divided into 3 Nadis of which one channel rises in the spinal column and two channels reside in the brain. The *Shushumna* usually remains dormant when other Nadis are active and subsequently flows when the other Nadi, are restrained. This happens when we breathe in *prana* through both nostrils. We only breathe through both nostrils about ten breaths in every hour, at dawn and at dusk. Chakras are active at all times. They are influenced by the energy elements of water, fire, earth, air and void space (*akasha*). The energy elements produce different physical, emotional and psychic states. The elements move inside the body through the breath and produce chemical changes via the endocrine glands, which mix these secretions into the blood instantaneously.

The first 5 major Chakras, located in the spinal cord, are the building blocks of psychophysical existence for the five senses, vision, taste, sound, smell and touch. Chakras have a definite relationship to the physical body and its functions. Each of the first five major chakras is connected to a specific sense organ and stores psychophysical energy, which then flows to all 7 major chakras from one chakra to another when activated by the breath.

A major Chakra resembles a spinning wheel when looking directly into the Chakra. However, viewed from the side it looks more like an energy vortex somewhat resembling the shape of a tornado. This energy funnel is tight and compact near the surface of the skin, and gradually widens as it extends outside the physical body to the outer edge of the aura. Each major Chakra from the root to brow has three or four vortices associated with it: one spiraling upward, one downward towards the earth, one out the front of the body and one out through the back of the body in some cases. The upward projecting vortex from one Chakra and the downward projecting vortex of the Chakra just above it join to form an energy column that runs vertically through the physical body from the bottom of the spine (Root Chakra) up in front of the spine and out through the top of the head (Crown Chakra). The Crown Chakra has two vortices, one opening upward towards the heavens, and one projecting downward into the energy column running through the body.

When a Chakra is "healthy and balanced" its front and rear vortices spin in a circular motion. However, if there is a disturbance or blockage in the flow of energy within a Chakra, the circular motion may become elliptical or, in extreme cases, severely flattened on its sides. Each Chakra has its own specific "frequency" or rate of spin, with the lowest rate of spin in the Root Chakra, and steadily increasing up to the highest rate of spin in the Crown Chakra.

The purpose or function of the human Chakra system is to take in higher – dimensional energy from the Universal Energy Field all around us and translate or step down its frequency of vibration to that which can be used within the physical body. Each major Chakra vibrates or spins at a different rate, and each Chakra will absorb energy from the UEF that is harmonically related to its own frequency. Thus energy from several frequency band within the UEF is absorbed by the different Chakras and is directed by the Nadis to those organs with which that Chakra is associated.

Many minor Chakras are also located throughout the body, and are usually associated with joints such as the knee, shoulder, elbow, etc. Additional minor Chakras are found in the palms of both hands and the soles of the feet, the ends of the fingers and toes. These minor Chakras appear as spikes of energy emanating from the body rather than the spinning vortices of the major Chakras.

Table 1: Major Chakras and Associated Organs and Glands.

Chakra	Associated Organs	Endocrine Gland
Crown	Upper Brain, Right Eye	Pineal
Brow	Ears, Nose, Lower Brain, Nervous System, Left Eye	Pituitary
Throat	Lungs, Larynx, Alimentary Canal	Thyroid, Parathyroid
Heart	Heart, Blood, Vagus Nerve, Circulatory System	Thymus
Solar Plexus	Stomach, Gall Bladder, Liver	Pancreas
Sacral	Reproductive System, Spleen	Testes, Ovaries
Root	Spinal Column, Kidneys	Adrenals

The cell is the fundamental structural and functional unit of all living organisms. There are certain differences between the cells of different living beings as well as the cells in the different part of the living organism. All cells contain a fluid called cytoplasm and a nucleus, and are enclosed in a cell membrane. Operations within the cells and the coordination among various cells make the being live. The life of all the living beings is, therefore, based upon the working of the cells.

The nucleus of a cell contains a chemical DNA (deoxyribonucleic acid). All the instructions needed to direct the activities of cell are contained within the DNA. DNA is a polymer. The monomer units of DNA are nucleotides, and the polymer is known as a "Polynucleotide." There are four different types of nucleotides found in DNA, differing only in the nitrogenous base. The four nucleotides are adenine (A), guanine (G), cytosine (C) and thymine (T). DNA from all organisms is made up of the same chemical and physical components. The DNA sequence is the particular side-by-side arrangement of bases along the DNA strand (e.g. ATTCCGGA). This order spells out the exact instructions required to create a particular organism with its own unique traits. The DNA is normally in the form of a double strand (double helix) where the second strand is complementary to the first strand. That is, in the second strand a sequence such as AGCTTT is replaced by TCGAAA which carries the same information.

The genome is an organism's complete set of DNA. Genomes vary widely in size: the smallest known genome for a free-living organism (a bacterium) contains about 600,000 DNA base pairs, while human and mouse genomes have some 3 billion. Except for mature red blood cells, all human cells contain a complete genome.

DNA in the human genome is arranged into 24 distinct chromosomes, physically separate molecules that range in length from about 50 million to 250 million base pairs. Each chromosome contains many genes, the basic physical and functional units of heredity. Gregory Mendel was the first to realize through extensive experiments with breeding of peas that at the lowest level, inheritance is binary, and that there is a minimum unit of inheritance now known as a "gene". Genes are specific sequences of bases that encode instructions on how to make proteins. Genes comprise only about 2% of the human genome, the remainder consists of non coding regions, whose functions may include providing chromosomal structural integrity and regulating where, when and in what quantity proteins are made. The human genome is estimated to contain about 30,000 genes.

Gregory Mendel showed that the characteristics of parents are passed on to their offspring through genes. These genes might produce visible characteristics in offspring, or might be carried for possible transmission to another generation. The children of one set of parents do not inherit all the same characteristics.

The union of two cells, the egg from the mother and the sperm from the father is the beginning of a new individual. These two cells like all others carry within them material that forms a definite number of chromosomes. These chromosomes carry heredity factors or genes. Chromosomes are pairs and each chromosome contains 1,000 or so genes that also occur in pairs.

The process of inheritance is based upon the process in which the offspring receives one of each gene pair from each parent. Some genes are dominant and some are recessive. An individual with a dominant gene, for a particular characteristic, displays that characteristic whether only one or both genes in the pair are dominant. If a gene is recessive, however, the characteristic associated with it does not show up unless both genes in the gene pair are recessive. In case only one gene in a pair is recessive, its effect will be masked by its dominant partner, but the recessive gene may still be passed on to the individual's offspring. Some characteristics are produced by a single gene or gene pair. Whereas multiple – factor inheritance involves the action of several genes.

Genes are now known to be implemented as sequences of genetic code that direct specific cells to produce a particular protein at a particular time. An essentially infinite number of possible different protein molecules can be produced depending on the particular order of amino acid molecules used in their construction. The code for protein production has been "broken" so that we now know that a three-letter sequence (a codon) is used to specify a particular amino acid (there are 20 amino acids). For instance, the sequence GGC specifies that the amino acid glycine is to be added to a protein molecule. Start and stop codons mark the beginning and end of a protein coding sequence in a manner startlingly like modern data communications schemes.

There are 64 possible codons and only 20 possible amino acids so some redundancy and error correction exists. The regulatory code sequences in genes that specify in which parts of the body and/or at which times a protein will be produced are much more complex and less well understood.

The genetic code has been compared to a blueprint specifying the design of an organism. In fact the genetic code specifies not only the design of the organism but provides for the mechanisms needed to "read" the code and manufacture the components of the organism as well as specifying the procedures needed for the life processes of the finished organism. Simple organisms are completely defined genetically. Each tiny nematode worm has exactly 958 cells. Humans, on the other hand, have trillions of cells and 30,000 genes so the genetic code is more of a general plan. For example, major blood vessels are genetically specified. Everybody has an aorta. But minor blood vessels grow where needed according to genetically defined rules.

Although all the somatic cells in an organism contain the complete code, in any given cell only a relatively few genes are active. The difference in the genes that are active determines the difference between, say, liver and brain cells. A complex gene logic determines when and where a particular gene will be "turned on". The gene logic can accommodate varying amounts of positional detail. The gene logic also controls when various activities will take place. Cells divide rapidly in growing organisms but do not divide in adults unless needed to replace dead or discarded cells. (Cancer involves a major breakdown in the gene logic in which cells grow in both an inappropriate position and at an inappropriate time. Cancer is thought to require multiple mutations, some of which can be inherited.)

The early insight from Human DNA sequence is summarized below:-

1. Human genome contains 3 billion bases.
2. An average gene consists of 3000 bases.
3. The functions are unknown for more than 50% of discovered genes.
4. The human genome sequence is almost (99.9%) exactly the same in all people.
5. About 2% of the genome encodes instructions for the synthesis of proteins.
6. Repeat sequences that do not code for proteins make up at least 50% of the human genome.
7. Repeat sequences are thought to have no direct functions. But they shed light on chromosome structure and dynamics. Over time more repeats reshape the genome by rearranging it, thereby creating entirely new genes or modifying and reshuffling existing genes.
8. The human genome has a much greater portion (50%) of repeat sequences than the mustard weed (11%), the worm (7%) and the fly (3%).
9. Over 40% of the predicted human proteins share similarity with fruit-fly or worm proteins.
10. Genes appear to be concentrated in random areas along the genome, with vast expanses of non coding DNA between.

11. Chromosome 1 (The largest human chromosome) has the most genes (2968), and the Y chromosome has the fewest (231).

12. Genes have been pinpointed and particular sequences in those genes associated with numerous diseases and disorders including breast cancer, muscle disease, deafness and blindness.

13. Scientists have identified about 3 million locations where single base DNA differences occur in humans. This information promises to revolutionize the processes of finding DNA sequences associated with such common disease as cardiovascular diseases, diabetes, arthritis, and cancers.

Scientists suggest that the genetic key to human complexity lies not in a gene number but in how gene parts are used to build different products in a process called alternative splicing. Other underlying reasons for greater complexity are the thousands of chemical modifications made to proteins and the repertoire of regulatory mechanisms controlling these process.

The HGP project is complete, many questions still remain unanswered, including the function of most of the estimated 30000 genes. Researches also do not know the role of Single Nucleotide Polymorphisms (SNPs), single DNA base changes within the genome or the role of non-coding regions and repeats in the genome.

Mice and humans (indeed, most or all mammals including dogs,

Table 2: Comparative genome sizes of humans and other organisms.

Organism	Estimated Size Million bases	Estimated gene number	Average gene density	Chromosome Number
Human	3000	~30000	1 gene per 100000 bases	46
Rat	2750	~30000	-- do --	42
Mouse	2500	~30000	-- do --	40
Fruit Fly	180	~13600	1 gene per 9000 bases	8
A type of Plant	125	25500	1 gene per 4000 bases	5
Round worm	97	19100	1 gene per 5000 bases	6
Yeast	12	6300	1 gene per 2000 bases	16
E-Coli (Bacteria)	4.7	3200	1 gene per 1400 bases	1
H-influenzae (bacteria)	1.8	1700	1 gene per 1000 bases	1

cats, rabbits, monkeys and apes) have roughly the same number of nucleotides in their genomes – about 3 billion base pairs. This implies that all mammals contain more or less the same number of genes.

Gene duplication occurs frequently in complex genomes; sometimes the duplicated copies degenerate to the points where they no longer are capable of encoding a protein. However, many duplicated genes remain active and over time may change enough to perform a new function. Since gene duplication is ongoing process, mice may have active duplicates that humans do not possess, and vice versa. These appear to make up a small percentage of the total genes, not larger than 1% of the total. Nevertheless, these novel genes may play an important role in determining species specific traits and functions.

What really matters is that subtle changes accumulated in each of the approximately 30000 genes add together to make quite different organisms. Further, genes and proteins interact in complex ways that multiply the functions of each. In addition, a gene can produce more than one protein product through alternative splicing or post-translational modification; these events do not always occur in an identical way in the two species. A gene can produce more or less proteins in different cells at various times in response to developmental or environmental cues, and many

proteins can express disparate functions in various biological contexts. Thus subtle distinctions are multiplied by the more than 30000 estimated genes.

Some nucleotide changes are neutral and do not-yield a significantly altered protein. Others, but only a relatively small percentage, would introduce changes that could substantially alter what the protein does. Put these alterations in the context of known inherited diseases, a single nucleotide change can lead to inheritance of sickle cell disease, cystic fibrosis or breast cancer. A single nucleotide difference can alter protein function in such a way that it causes a terrible tissue malfunction. Single nucleotide changes have been linked to hereditary differences in height, brain development, facial structure, pigmentation and many other striking morphological differences ; due to single nucleotide changes, hands can develop structure that look like toes instead to fingers, and a mouse's tail can disappear completely. Many of the average 15% nucleotide changes that distinguish humans and mouse genes are neutral, some lead to subtle changes, where as others are associated with dramatic differences. Add them all together, and they can make quite an impact, as evidenced by the huge range of metabolic, morphological, and behavioral differences we see among organisms.

Although genes get a lot of attention, it is the proteins that perform most life functions and even make up the majority of cellular structures. Proteins are large, complex molecules made up of smaller subunits called amino acids. Chemical properties that distinguish the 20 different amino acids cause the protein chain to fold up into specific three dimensional structures that define their particular functions in the cell.

The constellation of all proteins in a cell is called its proteome. Unlike the relatively unchanging genome, the dynamic proteome changes from minute to minute in response to tens of thousands of intra-and-extra cellular environmental signals. A protein's chemistry and behaviour are specified by the gene sequence and by the number and identities of other proteins made in the same cell at the same time and with which it associates and reacts. Studies to explore protein structure and activities, known as proteomics, will be the focus of much research for decades to come and will help elucidate the molecular basis of health and disease.

Most genes contain a switch called promoter. This switch regulates the activities of the gene and decides when and how the gene should become or not become active. An enhancer also works in the gene. The promoter and enhancer work only when the transcription factors responsible for mutation are operating. The genes are our active partners and are sensitive to the changes taking place in our body and mind and they register these changes by making suitable changes in their structure. By channeling our thoughts in a specific direction the genes can be changed, thus enabling us to progress in a desired way. This supports the view that spiritual persons can increase their power by sacred thoughts and determination. The genes are not our masters but are our servants, they are governed by our thoughts and influenced by our environment.

Studies in behavioral genetics have shown that both genetic and environmental factors influence the normal and deviant behavior of human beings. Only a few decades ago, psychologists believed that characteristics of human behavior were almost entirely the result of environmental influences. These characteristics now are known to be genetically influenced, in many cases to a substantial degree. Intelligence and memory, novelty seeking and activity level, and shyness and sociability all show some degree of genetic influence.

The principal role of genes in the chromosomes of human has now been identified. Faulty genes in chromosomes lead to different diseases as mentioned below.

CH1: Contains records of past lives. Faulty gene for GBA enzyme, which breaks down certain fats, leads to Gaucher's, disease.

CH2: It contains the history of journey leading to human life.

It has details of births in various species we lived before. Faulty PAX – 3 gene is associated with deafness and color difference in eyes. This causes Wardenburg syndrome.

CH3: Contains evidences for the entire past history in the form of genes. Faulty VHL gene causes abnormal blood vessel formation. This gives von Hippel – Lindau disease. The genes are related to diabetes, obesity, etc.

CH4: This contains information about our future. It also carries hints about forthcoming disease and traits. Faulty gene causes dementia. This leads to Huntington's disease.

CH5: This is very sensitive to environment and contains information about our immune system. It helps in study of genetic disease like asthma, diabetes, etc. Faulty gene cause malformed hands and feet. This leads to diastrophic dysplasia.

CH6: This is the intelligent chromosome, it is the basis of our intelligence. It has been shown that in some cases intelligence is hereditary. Faulty SCA1 gene causes clumsiness through withering of the cerebellum. This leads to Spinocerebellar atrophy.

CH7: It contains those characteristics which determine our behavior as human being. This is regarded as the most important chromosome. Faulty gene causes fatal build-up of mucus in lungs and pancreas. This leads to Cystic fibrosis. Chromosome-7 contains genes related to William Neuron Syndrome which causes mental disability and defiguring of face. They also influence leukemia, the cancer of blood cells.

CH8: This contains information about our likings and choices. Our habits and nature are stored and transmitted to next life. This means that our merits and demerits are also influenced by hereditary factors. Defective gene causes premature ageing. This leads to Werner's syndrome.

CH9: This determines the blood group. It also has a role in disease we suffer. Skin cancer is more likely in people with faulty CDKN2 tumor repressor gene. This leads to Malignant melanoma

CH 10: This chromosome contains the gene CYP17, which produces an enzyme that converts cholesterol into hormones called cortisol and Testosterone. These hormones produce stress in the body. Defect in MEN2A gene causes tumors of thyroid and adrenal glands. This leads to multiple Endocrine Neoplasia.

CH11: This contains genes which influence our personality. Harvey RAS oncogene predisposes to common cancers. This leads to cancer.

CH12: This is self assembled. Defects in PAH gene causes mental retardation by blocking digestion of common amino acid in food. This leads to Phenylketonuria

CH13: Stores characteristics of the past lives. Defects in BRCA 2 gene raises risk of breast cancer.

CH14: This is of indestructible nature. Faulty AD 3 gene is linked with the development of plaques in the brain. This leads to Alzheimer's disease.

CH 15: Determines gender. Abnormal FBN1, gene weakens connective tissue potentially rupturing blood vessels. This leads to Marfan's syndrome (position unknown).

CH16: This contains memory. Faulty PKD1 gene causes cysts to form, which trigger kidney failure. This leads to polycystic kidney disease.

CH17: This determines the life span. Mutations in P53 gene increase vulnerability to cancer. BRCA1 predisposes to breast cancer.

CH18: Helps in recovery from illness. Damage to DPC4 gene accelerates pancreatic cancer

CH19: This determines fertility. Defective gene for apolipoprotein raises blood cholesterol, predisposing to artery blockage. This leads to coronary heart disease.

CH20: Abnormal adenosine deaminase (ADA) gene destroys immunity. Correctable by gene therapy. This leads to severe combined immunodeficiency.

CH21: Wasting disease linked with defective superoxide dismutase I (SODI) gene. This leads to Lou Gehrig's disease.

CH22: This characterizes freedom of thought. Abnormal DGS gene triggers heart defects and facial changes. This leads to DiGeorge syndrome. Chromosome-22 plays an important role in immune system, mental disturbances and some types of cancers.

CH23: Abnormal DMD gene triggers muscle degeneration. This leads to Duchenne muscular Dystrophy.

CH24: Governed by the gene for testis – determining factor. This leads to Testicle development.

Cloning

Cloning is a technique to produce the genetic twin of another organism, but it can also be used for other purposes. There are three main types of cloning technologies.

1. Recombinant DNA technology or DNA cloning,
2. Reproductive cloning and
3. Therapeutic cloning.

DNA cloning refers to a process where a DNA fragment of interest is transferred from one organism to a self – replicating genetic element such as a bacterial plasmid. The DNA of interest can then be propagated in a foreign host cell. This technology has been around since the 1970's, and it has become a common practice in molecular biology laboratories today. This technology is important for learning about other related technologies, such as gene therapy, genetic engineering of organisms, and sequencing genomes. Gene therapy can be used to treat certain genetic conditions by introducing virus vectors that carry corrected copies of faulty genes into the cells of a host organism. Genes from different organisms that improve taste and nutritional value or provide resistance to particular types of disease can be used to genetically engineer food crops.

Reproductive cloning is a technology used to generate an animal that has the same nuclear DNA as another currently or previously existing animal. Dolly was created by this technology. If the low success rates can be improved (Dolly was only one success out of 276 tries), reproductive cloning can be used to develop efficient ways to reliably reproduce animals with special qualities. For example, drug producing animals or animals that have been genetically altered to serve as models for studying human disease could be mass-produced. Reproductive cloning also could be used to repopulate endangered animals or animals that are difficult to breed. Cloning extinct animals presents a much greater challenge to scientists because the egg and the surrogate needed to create the cloned embryo would be of a species different from the clone.

Therapeutic cloning, also called "embryo cloning" is the productive of human embryos for use in research. The goal of this process is not to create cloned human beings, but rather to harvest stem cells that can be used to study human development and to treat disease. Stem cells are important to biomedical researchers because they can be used to generate virtually any type of specialized cell in the human body. Many researchers hope that one day stem cells can be used to serve as replacement cells to treat heart disease, Alzheimer's, cancer, and other diseases. Therapeutic cloning technology may some day be used in humans to produce whole organs from single cells. Much work still needs to be done before therapeutic cloning can become a realistic option for the treatment of disorders. Another potential application of cloning to organ transplants is the creation of genetically modified pigs from which organs suitable for human transplant could be harvested.

Should humans be cloned? Physicians from the American Medical Association and scientists with the American Association for the Advancement of Science have issued formal public statement, advising against human reproductive cloning. Due to the inefficiency of animal cloning and the lack of understanding about reproductive cloning, many scientists and physicians strongly believe that it would be unethical to attempt to clone humans. Scientists do not know how cloning could impact mental development. While factors such as intellect and mood may not be as important for a cow or a mouse, they are crucial for the development of healthy humans. With so many unknowns concerning reproductive cloning, the attempt to clone humans at this time is considered potentially dangerous and ethically irresponsible.

Several attempts and trials have been made to produce improved quality of animals. Similar experiments are also underway to improve the level of human beings. Scientists aim at producing individuals having desired qualities. The attempts to improve the cell quality in animals and humans by changes in genes have not yielded the desired results. Attention of scientist has now shifted from genes to electro magnetic fields for improving the quality of cell. Experiments by several researchers have shown that these methods are successful to some extent in improving the body structure but fail to produce the desired qualities. The scientific attempts can not assure that the moral, intellectual and social qualities will improve. Such conclusions were drawn by yogis in the past. They had ruled that the only way to improve the quality of the offspring is that both the parents should prepare themselves by spiritual practices before they decide to have a child.

Yogic practices like penance and meditation reform the chromosomes which improve the quality of the offspring. This is the only way to improve the moral, intellectual and social qualities in the offspring.

Bio Photons

A photon is a quantum of light, or the smallest possible packet of light at a given wavelength. It is emitted by an atom during a transition from one energy state to another. Photons travel at the speed of light and have mass and momentum dependent on their frequencies. By classical reasoning a photon would have the apparent dualistic property of being either a particle or a wave disturbance. Light is electromagnetic radiation in the wavelength range extending from about 0.4 micron to about 0.7 micron. Two sinusoidal oscillations of the same frequency are said to be mutually coherent if they exhibit a constant phase relationship during the course of time. For example, a laser is coherent and sunlight is partially coherent.

It is now well established that all living systems emit a weak light current of some photons. The discovery was made in 1920s by Alexander Gurwitsch, a Russian biologist, who called this photon emission from living cells "mitogenetic radiation," in order to express its growth stimulating capacity. The intensity of this ultra weak light is nearly equal to intensively of light of a candle placed at a distance of 10 Km. Photo electric devices to measure this weak light were developed in 1950s. Scientists found that the nature of this, weak light emitted by living cells is different from the sunlight. They called these light photons as bio-photons.

The pioneering work done by Fritz – Albert Popp has given a deep insight into the phenomenon of bio photon emission. According to him the purely molecular aspect of life sciences may be only one necessary step in understanding biology and can never reach the significance of sufficient and complete explanation. Molecules have no intelligence, despite the manifold impressive functions that have been assigned to them. Even the enzymes or messenger molecules have to be triggered by external energy, i.e. photons which activate the diversion transition state complexes. These activation energies cover the whole electromagnetic spectrum. The non-thermal photons provide the right quantum energies at the right place and right time for 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) that theoretically only one photon per cell could be sufficient for activating 10⁹ reactions per second, provided that it originates from a coherent photon field. If this field is coherent and non-thermal one, it is theoretically able to borrow the photon energy at the right time and take it to the right position of the reaction and to reabsorb it immediately after this event which, in general, takes not longer than about 10⁻⁹ seconds.

Consequently, the weak photon current from biological systems, which – as we know nowadays covers the whole spectrum range at least from UV to infrared and which we call "bio photons" may well suffice to take the role of regulating the whole biochemistry and biology of life. The bio photon emission displays a few up to some hundred photons per second per centimeter square within the spectral range from at least 260 to 800 nm. It is closely linked to delayed luminescence of biological tissues which describes the long term and ultra weak reemission of photons after exposure to light illumination.

What are the consequences of coherence? It results in properties that are characteristic of biological systems. These include the high efficiency of energy transfer and transformation which often approaches 100%; the ability of communication at all levels within cells, between cells and between organisms capable of resonating to the same frequencies; the possibility for sensitive, multiple recognition systems utilizing coherent electromagnetic signals of different specific frequencies, such as for example, the organization of metabolic activities within the cell, the operation of the immune network and a host of other biological functions involving specific

recognition between hormones or ligands and their receptors; and finally, the stable persistence of the working system arising from the inherent stability of coherent states.

Practically all organisms emit light at a steady rate. An increasing number of observations from different laboratories all over the world suggest that bio photons are emitted from a coherent photon field within the living system. Organisms are thus emitters and most probably, also receiver of coherent electromagnetic signals which may be essential for their functioning. When the spectrum of bio photons is examined, it was found that the light is always in a broad band of frequencies from the infra-red to the ultraviolet, with approximately equal number of photons distributed throughout the range. In other words the distributions does not depend on the wavelength; $f(\lambda) = \text{const}$. This means that the light is emitted from all kinds of molecules all over the cell. The living systems store energy (or photon) from 10⁻¹⁰ m to meters or more, and 10⁻⁹ second to days or longer time intervals – in a readily mobilized form. They do not suffer from energy shortage on account of their high storage capacity within the intricate space-time organization.

Systematic measurement of bio photon emission of the human body has shown the following results. (1) The left right symmetry of the human – body, (2) biological rhythms such as 14 days, 1 month, 3 months and 9 months; (3) disease in terms of broken symmetry between left and right side, and (4) light channels in the body, which regulate energy and information transfer between different parts.

The bio photon emission is indicative of an endogenous, innate, electromagnetic field pervading the entire organism, which may act as both sender and receiver of the bio photon that are "electromagnetic bio – information" used in regulating life processes. These observations, among others, suggest control within the living state that is non-local and possibly electromagnetic in nature. Many significant correlations between features of the weak biological light and a number of fundamental biological processes, such as cell division, death, and major shifts in metabolism, exist. These correlations may indicate that the light (electromagnetic field of the organism) is a sensitive, global expression of biological regulating processes.

The bio photon is trapped and remitted by DNA, which undergoes physical resonance, resulting in light emission with at least some coherence. Biological process may be integrated by the endogenous bio electromagnetic field that has a primary organizational and informational role. Conformational states of DNA may serve as the photon storage of the coherent modes of the electromagnetic field within the cell.

From the bio physical point of view bio photons are regulating the body in its rather complex functions. The interference patterns of bio photons originating from the resonance tuning between the coherent field and biologically matter (preferentially DNA) governs the availability of energy in a concerted action of the whole. Consequently, the organizational capacity is reflected by characteristics of bio photon emission.

The biological and physical activities affecting bio photons signals belong to the macroscopic class. The sensitivity is such that a bio photon signal appears to provide faithful reflections of biological and physiological activities of the emitting system. If it is true for all macroscopic biological activities, then a bio photon contains decipherable and digitized signature of all macroscopic biological activities. Bio photon emission is thus seen a crucial evidence of a physical basis of life.

A Religio – Scientific

Analysis of Body Functions

We learned about the Karma body and *tejas* body and briefly reviewed the subjects concerning the *tejas* body and physical body that are important to understand the functioning of our body system. The concept of Karma body, singular to Jaina system of thoughts, has been described in sufficient detail for our purpose. The details of *tejas* body are not available in Jaina literature. The information derived from Vedic school of thought, psychology and science help us in understanding the structure and functioning of *tejas* body. The Jaina philosophy assigns the following functions to *tejas* body as described earlier. (1) Management of the body systems, and (2) to provide support and control for functioning of the body systems. It is also stated that the *tejas* body is electric body made up of *tejas vargana*. The Vedic description of subtle body made up of five *Koshas* and the psychological concepts of energy bodies are in close agreement with the Jaina views but they also provide further insight into the structure of the *tejas* body. All three schools of thought are referring to electrical nature of the body having similar functions so it can be assumed, without any peril to the Jaina viewpoint, that the five *Koshas* or the energy bodies are the *tejas* body of Jainas. Barbara Ann Brennan says that the energy bodies are made up of light beams and a plasma like substance. The light is electromagnetic waves and the plasma consists of electrically charged particles. Thus effectively the energy bodies comprise of electromagnetic fields. Hence we arrive at the conclusion that *tejas* body is electromagnetic in nature.

In support of the above conclusion we quote here the investigations carried out by a South African doctor and an engineer of London in 1930s.

"Intricate apparatus was designed and built by the engineer and the experiments started. Animals were used first. Their apparatus proved that animals were born with a definite electric charge. They were able to record and tabulate this energy. They found that the more intelligent animals had a higher charge than the lower forms. At the moment of death the charge disappeared. In the animal experiment the records showed that the charge remained more or less the same throughout life except when the animal was breeding."

"In the case of human beings they found that the babies were born with a definite charge. After death the charge vanished. An average charge, they found, was 500 volts. As the subject grew older the charge increased not with age, but according to the type of character the subject was developing. In coarse animal natures the charge remains low and in cases of mental disease and lunacy the charge dropped. They found that male babies had a higher charge at birth than female babies, but that the female could catch up and pass the male according to the various characteristics shown."

One important finding of these investigations is that all organisms are born with a definite electric charge and this charge vanishes after death. The investigators did not know the reason of this fact, but according to Jaina view the reason is clear. The organisms are born with a *tejas* body, which departs from the physical body on death. It is the *tejas* body that carries the charge.

Another important finding is that the amount of charge on the body depends on intelligence of the organism and it increases with intelligence. We know that the *tejas* body consisting of energy bodies contains the vital energy, thought, emotions, and experiences etc, which are in the form of plasma structures. The power and intensity of such structures ought to increase with intelligence implying a higher charge. This explains why charge increases with intelligence of the organism. In case of human beings as the mental and spiritual power grows with advancements the *tejas* body becomes stronger and the charge increases. When a mental disease or lunacy occupies a person a decrease in charge is clearly understood. The state of the *tejas* body is thus a measure of mental and spiritual development of a person. The charge can be very high on the bodies of yogi's, particularly at the time of meditation, so much so that it can give shock to a common person.

We know that the Karma body and *tejas* body are always attached to the soul and they never separate out until liberation is attained. What is the reason that these two bodies always hold on together? On death of a being the physical body is discarded and the soul migrates with Karma body and *tejas* body to take next birth. During this transition period the two bodies remain united. This is possible when both the bodies are of electromagnetic character. We, therefore, infer that the Karma body is also of electromagnetic nature. However, the electromagnetic fields of the two bodies must be different in order to maintain their separate identities. The validity of this inference is supported by the fact that we do have different electromagnetic fields in our body. Scientists have reasoned out that biophotons are emitted by a coherent electromagnetic field which is different from the electromagnetic field of solar radiations. Thus we conjecture that there are three different types of electromagnetic fields one for the Karma body, second for the *tejas* body and the third emitting the bio photons. We shall see later that perhaps the first and the third fields are the same.

One may question how electromagnetic field can have a body form. The scientific evidence suggests that this is possible. A group of Spanish scientists doing studies on computer simulation have claimed that light can be transformed into a fluid like substance. The scientists of University of Vigo were studying the properties of light pulse on computer. By application of high energy laser the light pulse became very dense. They observed a surface tension like property in the dense light pulse. When they put these pulses on another surface small droplets were formed. One of the scientists of the group is confident that he shall be able to confirm these findings in the laboratory. He thinks that information can be stored easily and safely on the droplets formed by dense pulses and this fact can be used to produce next generation computers. So the electromagnetic light pulses can not only form a body shape, they can also store information. This is what precisely happens in a Karma body.

We now consider how the *tejas* body is performing the functions assigned to it. The foregoing description shows that there are three primary systems which help *tejas* body in management, support and control functions. (1) The energy bodies receive *prana* energy through breathing. The etheric body supplies this energy to various parts and organs of the physical body. The astral body contains our feelings and the mental body contains our thoughts. The feelings and thoughts are the instruments for the management of the body system. The spiritual body is the storehouse of our experiences and controls our behavior and the decision making process. (2) The Chakras are the distribution centres from where the *prana* energy is supplied to the Nadi system. The Chakras spinning at different speeds also work as oscillators and draw in higher dimensional energy from space. The Chakras closely work with the endocrine glands and influence the secretions which control the body functions. (3) The Nadis are the distribution channels for *prana* energy. There is a very elaborate network of Nadis which takes the *prana* energy to every cell of the body.

It is clear from above that the energy bodies, the Chakras and the Nadis jointly discharge the functions of *tejas* body. The existence of Chakras and the Nadis is linked to the physical body. In the transition period between death and next birth only energy bodies accompany the soul. The Chakras and Nadis appear again when the soul forms the next body. Let us now consider the emission and working of bio photons. On close examination we find that many features are common between *adhyasaya* waves and biophotons. Table 3 gives a comparison between the two.

Table 3: Comparison Between *Adhyasaya* and Bio photos

	Adhyvasaya	Bio photon
1.	Since the bondage of Karma is uniform over all soulpradesa, the adhyvasaya waves from the Karma body and so from all body parts are identical	Every cell emits bio photons and this emission is uniform all over the body in case of healthy cells. The emission is reduced from diseased cells.
2.	All kinds of Karma bond with every soul pradesa. Therefore adhyvasaya waves of all kinds are emitted by every division of the Karma body and hence by every part of the physical body	The bio photons are emitted over a wide range of frequency. The number of photons emitted is almost same at all frequencies, i.e. $\xi = \text{const}$
3.	Adhyvasaya is present in all living organism.	Emission of bio photons has been found in all organism.
4.	Adhyvasaya is source of knowledge. The knowledge of the soul manifests in the subtle and physical body through adhyvasaya.	Atoms and molecules have no intelligence. All atomic and molecular activities in the body are controlled by bio photons. Bio photons provide intra and inter-cell communication and manage the biological functions.
5.	Karma bondage and Karma Vipak is generally a continuous process	The coherent electromagnetic field responsible for biophoton emission constantly receives energy from environment and radiates out biophotons
6.	Adhyvasaya contains the information released by the Karma body at any instant and communicates the same to tejas body and the physical body for further action.	The source of bio photon is the coherent magnetic field. As per the directives of this field the biophotons perform the activities in the cell

It is clear from the comparison that there is a great similarity between *adhyvasaya* and bio photons. It can therefore be assumed that the coherent magnetic field emitting bio photon is also similar to the Karma body. We had earlier conjectured that the Karma body is electromagnetic in nature. Now it is evident that Karma body is, in fact, comprised of coherent electromagnetic field. This assumption is further validated by the fact that the bondage and *vipak* of Karma over all soul *pradesa* take place simultaneously. The *adhyvasaya* waves therefore always have a constant phase relationship and are coherent. The scientists are perhaps not sure why the bio photon light is coherent but the Jaina doctrine clearly explains the reasons for this coherence. It is now easy to understand what is the source of intelligence in bio photons. The intelligence comes from the soul which is the ultimate source of *adhyvasaya*. Being coherent electromagnetic field the Karma body is very powerful and can store a very large amount of information, almost infinite, for thousands of years or more.

We now compare the functions of *Naam* Karma and genes. A close examination shows that the genes are performing almost the same functions which are assigned to various *Naam* Karma. For example, the decisions like type of body of the organisms, making of body components, organs and parts, form of body, skeleton structure, pigment of body skin, fully developed or deficient body, morphology of body, etc are common features to both. In fact, the *Naam* Karma gives a comprehensive account of how different species having varying personal body features and traits are formed. The genetic science on the other hand offers only a limited view of body formation but it is hoped that with the advancement in genetic science more and more knowledge regarding body functions shall be gained and then perhaps it will be discovered that what the modern science with the help of large fleet of highly qualified scientists and most sophisticated technology has found is already available in Jaina scriptures. The only difference is that what exists in the scriptures is in the form of decision formulae and the findings of science offers a detailed

description answering questions like what, when, how the processes occur. This is indeed a great credit to science but it should not be construed that it has discovered something new, in fact it is only reconfirming what was said by omniscient Tirthankars.

The genes carry all the instructions for making proteins. Only a part of the total instructions are used at any particular location of the body and a cell suitable to that location is made by the genes. Who makes this selection of the set of instructions to be employed? According to Jaina doctrine such decisions are assigned to the Karma body. The Body-making Karma contains the information required for constructing a body for any particular specie and all the body parts of that specie. The feeling-producing Karma are perhaps instrumental in producing faulty genes which develop various disease and pain in the body. Division of cells keeps our body alive. Scientists do not know the definite reason for this division. According to Jainas the life-span Karma determine the life span and therefore these Karma must be responsible for division of cells. Thus it is seen that all *aghatin* Karma operate at the level of genes and take part in the construction, maintenance, operation and control of body parts and body functions. Recently a gene has also been found to be connected with the faith of a person. It means that some *ghatin* Karma also influence genes. As noted earlier these Karma form the coherent electromagnetic field which emit bio photon of different frequency and the bio photons control the chemical and biological activities of the cell and so the body functions.

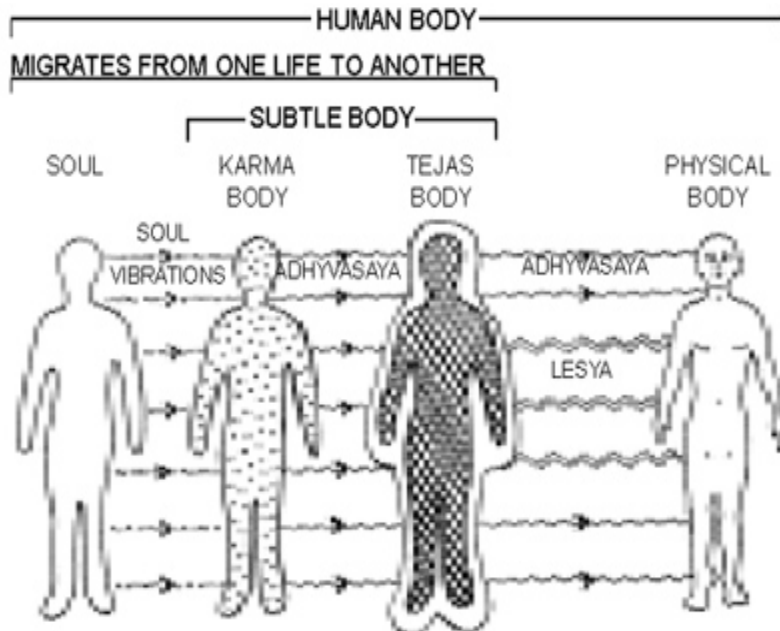
We consider now the process of bonding of karma. Knowing the electromagnetic character of the Karma body it is justified to assume that the Karma *varganas* are also electromagnetic. Like sunlight Karma *vargana* are present in the entire space and they also have a spectrum. The bondage of Karma *vargana* with the Karma body is now explained. Under the action of yoga and passion the soul and hence the Karma body vibrates. The frequency of vibration depends on the passion, different types of passions induce different frequencies. When the Karma body vibrates at a particular frequency the Karma *varganas* of the same frequency are attracted and attach themselves with the existing Karma of the same character. The Karma *varganas* are assumed to be electromagnetic waves but the bonded Karma perhaps form a plasma like structure resembling the shape of the physical body. That is, the Karma *varganas* transform from wave nature to particle nature, just like sunlight, when Karma is formed. The passion is the binding force between the old and new Karma. The Karma differ by frequency and thus a large types of Karma can be formed. The number of *vargana* bonding at a time depends on the degree of passion, stronger the passion larger is the number of *vargana* bonding with each soul *pradesa*. *Varganas* of different frequencies and hence different types of Karma bond with any soul *pradesa* at different times. The bonding is uniform over all soul *pradesa*. The bonded Karma remain in passive mode for a given period of time as said earlier.

The shedding of Karma from the Karma body is a reverse process. On the expiry of passive time period or on account of initiative taken by the individual vibrations specific to the Karma to be shed take place in the soul. These vibrations having specific frequency activate the respective Karma which transforms its state from particle (or plasma) mode to wave mode. The Karma are shed uniformly and simultaneously over all soul *pradesa*. These Karma waves interact with *tejas* body to produce *lesya* waves in case of *ghatins* Karma or produce bio photons, which operate at DNA and cell level, in case of *aghatin* Karma. In either case the organism experiences the outcome of the shed Karma. The number of Karma *varganas* shedding from each soul *pradesa* at any time depends on the intensity of passion. Strong passion shed large number of Karma *varganas* resulting in intense experience by the soul, weak passions lead to light experience. As infinite number of Karma *varganas* bond for any given Karma the process of shedding continues for a certain time called the active period of Karma.

We had seen earlier that the energy bodies have specific roles and harbour our thoughts, feelings, experiences, etc. These functions are also assigned to *ghatin* Karma, which produce *lesya* waves in our body. The *lesya* produce our feelings that cause the endocrine glands to secrete hormones that control the body functions. The *ghatin* Karma thus have a relationship with

lesya. The *lesya* are present till the attainment of thirteenth stage of development of the soul. All *ghatin* Karma are destroyed when the soul enters the thirteenth stage. At this stage the soul becomes Arihanta. The *aghatin* Karma related to the physical body continues to exist till the fourteenth, and the last, stage of development after which the soul is liberated.

A simple model of human body is now constructed as shown in Fig. 3 based on above findings. The human body is a superposition of three bodies, the karma body, the *tejas* body and the physical body. The soul pervades the entire space of the body. We know that the soul is non-physical, immortal and indestructible. The Karma body comprises of coherent electromagnetic field formed by *Karma varganas*. The *tejas* body contains electromagnetic plasma energy and comprises



NON PHYSICAL.
IMMORTAL.
INDESTRUCTIBLE.

PHYSICAL.
COHERENT
ELECTRO-
MAGNETIC.
KARMA
VARGANA.

PHYSICAL.
ELECTRO-MAGNETIC
PLASMA, ENERGY.
TEJAS
VARGANA.

CELLS HAVING DNA
PROTEINS
OTHER CHEMICALS
AND
BIO-ELECTRICITY

CONSCIOUSNESS,
KNOWLEDGE,
INTELLIGENCE,
PERCEPTION,
BUSS.

STORES,
RECORDS,
MEMORY,
SAMSKARAS
OF ALL
PAST LIVES.

CONTROLS,
REGULATES,
MANAGES,
PHYSICAL
BODY FUNCTIONS.

SENSE ORGANS,
BRAIN,
NERVOUS SYSTEM,
ENDOCRINE GLANDS,
BONES, MUSCLES,
BLOOD AND
OTHER PARTS.

CONSCIOUSNESS
MANIFESTS IN
ALL BODIES.

OBSCURES
ABILITY
OF SOUL,
COLORS
KNOWLEDGE
PERCEPTION
ETC.

VITALIZES
PHYSICAL BODY.
TEMPORARY
STORAGE OF
EMOTIONS,
FEELINGS,
THOUGHTS.
CHANNELS
PRANA ENERGY.

CONVERTS INPUTS
FROM KARMA BODY,
TEJAS BODY AND
ENVIRONMENT INTO ACTION.
PHYSICAL STORAGE OF
KARMA BODY IMPRESSIONS,
ENVIRONMENTAL AND SELF
GENERATED INPUTS.
MANIPULATION OF INPUT
INFORMATION.

FIG. 3. Schematic Model Of Human Body

of *tejas vargana*. The physical body consists of cells that contain DNA, proteins, other chemicals and bioelectricity. The soul possesses consciousness, knowledge, intelligence, perception and bliss. The Karma body stores records of actions and decisions, memory and samskaras of all past lives. The *tejas* body controls, regulates and manages the functions of the physical body by its electromagnetic field. The physical body contains sense organs, brain, nervous system, endocrine glands, bones, muscles, blood and other parts and organs required for physical functioning. The soul manifests in all the three bodies, where the consciousness can be felt. The karma body obscures the innate ability of the soul and limits its powers. The vibrations of the soul are converted into *adhyvasaya* waves bearing the characteristics of the Karma active at that instant in the karma body. The *tejas* body channelizes the prana and cosmic energy vitalizing the physical body. It also temporarily stores emotions, feelings, thoughts and experiences, which control and regulate the actions of the physical body.

The physical body is the means through which the soul performs actions and interacts with the environment. It appears that in the early period of formation of the body the memory records and *samskaras* of the past lives are copied on to the brain from the Karma body. This information remains in sub conscious state and cannot be accessed by conscious efforts. However, it participates in our day-to-day working and influences the decisions we make. Other important factors in decision-making are the inputs from the karma Body in the form of *adhyvasaya*, our emotions, feelings and thoughts residing in the *tejas* body, the condition of the physical body and the environmental stimuli received through sense organs. All the inputs are processed by the brain and a final decision for action is taken. The decision taker is the soul.

The advancements in physical and life sciences have enabled scientists to play with the physical body. One significant development is the application of Neuro-Electromagnetic fields in the brain. Michael A Persinger, his associates and other scientists have shown that a wide variety of human experiences, including divine, can be generated by applying suitable electromagnetic fields in appropriate locations of the brain. During such experiments only the physical brain is affected but the Karma body, which stores the original memory, is not accessed. All physical changes made by scientists confine to the physical body and do not affect the subtle body. But if such physical changes bring about a change in the thoughts, emotions and perceptions of a person, they can have an indirect influence on the subtle body. The Karma body is beyond the reach of scientists.

Concluding Remarks

In conclusion we note that:

1. The Karma body and the *tejas* body are electromagnetic in nature. The Karma body is made up of coherent electromagnetic magnetic field and the *tejas* body is in the form of energy bodies. The *tejas* body also contains Nadis and Chakras when the person is alive and physical body exists
2. The Karma are stored in the form of light structure in the Karma body The Karma remain in the passive mode for a long period of time and during this period they do not affect the working of the physical body and *tejas* body.
3. When the Karma become active they control and regulate the body functions mainly in two broad ways.
 - a. The *ghatin* Karma control our feelings through *lesyas* in the *tejas* body. The feelings regulate hormone secretions from the endocrine glands which control the body functions. The *ghatin* Karma also control the mind and the nervous system.

b. The *aghatin* Karma operate at the level of genes and DNA. The genes contain the necessary codes for making different types of proteins and cells which can constitute bodies for all species. The working of DNA is supposed to be controlled by light photons emitted by the coherent magnetic field of Naam Karma in the Karma body. Under the effect of feeling producing Karma these light photons can also produce faulty genes which cause disease of various kinds. The division of cells and hence the age of an organism is also controlled by Karma. There is evidence that *ghatin* Karma may also influence the working of genes.

4. The ultimate source of intelligence and knowledge is the soul. It is the power of the soul which can perform the feats like.

a. Control and regulate millions of chemical and biological activities in a cell per second in all the trillions of cells at a time.

b. Establish correlations between all the cells for a purposeful and meaningful functioning of the body.

c. Maintain a liason and harmony with other organisms, the environment and with the cosmos at large through the powerful magnetic fields.

It is interesting to repeat here the following scientific statements

"..... There observations, among others, suggest control within the living state that is non-local and possibly electromagnetic in nature. Many significant correlation between features of the weak biological process, such as cell division, death, and major shifts in metabolism, exist. These correlations may indicate that the light (electromagnetic field of the organism) is a sensitive, global expression of biological regulating processes. Biological process may be integrated by the endogenous bio electromagnetic field that has a primary organizational and informational role."

In this book we have briefly dealt with essentials of the Doctrine of Karma, that is required to understand the mechanism behind its operation, the scientific findings relevant to this doctrine and have attempted to establish a relationship between the two different schools of thoughts and have seen that the two streams of knowledge not only support each other but also enhance our understanding of the subtle secrets of life which are guiding and governing our behaviour physically, mentally and emotionally. The science offer no contradictions with the religious themes but rather strengthen our belief in the fundamental laws of life enunciated by the omniscient. These findings, I hope, would deepen our faith in the truth seeking path shown by Arihantas. This is particularly significant for those who do not believe in the existence of soul. Irrespective of his point of view or belief the law of nature is working in every individual and guiding his destiny. Those who wish to know more about the realities of nature, as pronounced by Arihantas, are referred to other canonical texts on Jainism.

Lastly, we end with the hearty remark that the Jaina doctrine "What you sow is what you reap" is perfectly scientific and true.