

Karma, Living System, Genes and Human Performance

Dr. Narayan Lal Kachhara

Dr. Sohan Raj Tater, Samani Unnat Pragya

Abstract

Karma is the central principle of Jain philosophy. It is a record of actions performed in the past. This information is stored and carried forward to next life thus connecting lives of a soul. Karma becomes the source information for structure and performance of the physical body. Jain philosophy describes two types of karma, *bhava* karma which makes up the impurity of the soul and *dravya* karma is a physical structure made up of subtle matter. Karmas bond due to activities and passions of the soul and are defined by four properties, numerical strength, and type of nature, duration and intensity of bond. The eight types of karmas are divided in two group's psychical and biological karmas both having specific roles in the constitution and performance of the body.

Bonding and rise of karma are continuous processes; the rise is caused by main and auxiliary types of causes. A study of rise or fruition of karma explains the basis of the processes taking place in the body and have been studied by modern science. The working of different types of karma in the life of a being is discussed.

The body system comprising of soul, subtle karma and fiery bodies, and the gross material body is described and interaction between the three component units is discussed. The interaction is supposed take place through radiations known as *adhyavasaya* and *lesya*. The relationship between karma and gross body is discussed in detail. The inter-connection between all types of bodies is also examined.

It is shown that there is a similarity between the roles of karma and genes. Genes being structures of atoms and molecules are supposed to be devoid of natural intelligence. The karmas are postulated to be the source of intelligent actions of genes and many of their functions. The overall performance of the being is determined not only by karma and genes but also by external factors constituting the environment.

Introduction

All Indian philosophies believing in re-birth believe that the records of actions performed in the life are maintained in some form and that these records become a cause for effects in the future life. Such records are known as karma (or *Samskara*). The soul is immortal and is embodied due to his karma, which are the cause of cycle of rebirths. All births of a soul are not temporally independent but are linked through

karma records. The powers and abilities the soul enjoys in a particular life depend on his performance in previous births. Therefore, state of the soul in this life has not come as a surprise; it is a logical outcome of his previous performances.

According to Jaina philosophy the soul is one of the six real that constitute this universe. The other important reality is matter, both subtle and gross. A reality or substance has three properties. (1) It undergoes transformation and changes its form. Each form is called a *paryaya*. (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 [1]. 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 well-defined rules of karma. Here "death" only implies that the soul leaves the present mode, the soul in fact does not die. The soul is immortal and only changes its form when it enters from one body to another. In this process the karmas, which are impressions of the actions performed by the soul, are carried forward to the next body and continuity in mundane existence of the soul is maintained.

In modern times *pudgala* (matter) has received more attention of scholars and scientists and the body as a physical entity has been studied in detail. These studies try to explain all processes and phenomena in the body on physical grounds neglecting the existence of *jiva* (soul). Because impure *pudgala* (*skandha*) is also possessed of powers and is capable of self organization in a limited way some success has been achieved in explaining the body process and its functioning by physical laws. But there are many deeper aspects of the body that defy pure physical basis of explanation and no satisfactory answers are found. Jain philosophy asserts that it is combination of *jiva* (soul) and *pudgala* that is working in the body and anyone of them alone cannot completely explain the structure and functioning of the life unit.

Jiva being non-physical is not amenable to direct physical analysis. The connection between *jiva* and material body is also not direct but is made through the karma body. Jain philosophy describes in detail this karma body, its formation, functions and its role in the formation and functioning of the material body. This knowledge can help in a big way in decoding the mysteries of the material body and its functioning. We briefly survey in this paper the scope and potential of interaction between the karma body and material body and try to understand the combination of *jiva* and *pudgala* in a scientific way.

***Bhava* Karma and *Dravya* Karma**

There are two types of karma *bhava* karma and *dravya* karma [2]. *Bhava* karma is the impurity of the soul or impure consciousness and is non-physical. These karmas are impressions of the actions of the soul and exist as some kind of virtual structure in the soul. The impression is memory of the action and so the soul knows all the actions performed by him in the past and all previous lives. The information stored in the memory relates to worldly activities and is hindrance in self-realization. This is why it is called impurity that hides the real nature of the soul. *Bhava* karmas are the cause of future modes of the soul.

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

Bonding of Karma

A living being is engaged in some kind of activity of body, speech or mind or some combination of these agencies. These actions and accompanying passions (*kasayas*) induce vibrations in the soul (*bhava* karma). The karma body also vibrates on account of the principle of parallelism that holds between the *bhava* karma and karma body [3]. The vibrating karma body attracts karma *varganas* from the surroundings by the principle of resonance. The incoming karma *varganas* bond with the existing karma and become part of karma body. This karma carries the impression of the source action. The process of bonding takes place both in the soul and karma body simultaneously. Passion is the binding force between incoming *vargana* and the existing karma. If the passion were absent or not operative at any instant the incoming *varganas* shall not bond with the karma and will exit back to cosmos without interacting with karma. The karmas bond all over the karma body, *atman pradesas*, that occupies the space of the physical body. In terms of physical body it means that karmas bond uniformly with each cell of the body. So each cell contains the same amount of karma at any instant.

Karma Bonds

There are four properties of Karma bonds [4]. These properties describe the way in which the karma system works.

1. Numerical strength of Bond (*Pradesa bandh*). Numerable, innumerable or infinite number of karma *varganas*, depending on the strength of action, may bond on each *pradesa* of karma body, and on each soul *pradesa*, (and so on each cell) uniformly.

2. Nature of Karma bond (*Prakriti bandh*). There are eight main types of karma; their nature is defined by the particular property of the soul they obscure [5].

1. Intelligence (or Knowledge) obscuring (*Jnanavarniya*) karma. A pure soul has perfect knowledge; karma obscures and limits the pure and perfect intelligence/knowledge of soul.
2. Awareness obscuring (*Darsanavarniya*) karma. This karma restricts the self-awareness and perception ability of soul.
3. Feeling producing (*Vedaniya*) karma. A pure soul enjoys infinite bliss. This karma obscures the bliss property and produces the feelings of pleasure and pain to appear depending on the situation.
4. Deluding (*Mohaniya*) karma. A pure soul experiences the absolute truth. The deluding karma hinders the perception of truth. This happens in two ways, one the perception and comprehension is obscured so that truth is not apparent, and second the equanimity of conduct is obstructed.
5. Age determining (*Ayusya*) karma. A pure soul is ageless, it is never embodied. The age determining karma determines the age, life span, in a particular realm viz., animal, human, infernal or heavenly mode.
6. Form producing or (*Nama*) karma. This karma decides the form of existence, species, in a particular realm and the structure, detailed structural features, outward appearance etc of the being. The concept is very general and refers to all kinds of forms including all animals, plants, humans, infernal beings and heavenly beings.
7. Status (quality) determining (*Gotra*) karma. This karma refers to quality of performance (conduct) in a given mode, including effects of inheritance (genetic?) one gets from the parents.
8. Vitality (or Will Power)-obstructing (*Antaraya*) karma. This karma produces obstruction in the expression of vitality of soul and causes hindrance in the soul action.

3. Duration of bond (*Sthiti bandh*). The karma remains bound to the karma body for certain duration of time. This duration is determined by passions active in the soul and it

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.

4. Intensity of bond (*Anubhaga 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. The intensity of bond is determined by the total amount and quality of passions present in the soul. The intensity of bond is the real power of karma. The other three properties shall be of marginal value if the intensity of bond is low for the intensity of experience by the soul shall be mild on rise of karma. This means that the passions are the controlling forces in the experiences made by the soul.

The karmas are divided in two groups' *ghati* and *aghati* depending on their influence on soul [6]. The former drastically alters and destroys the basic nature of the soul; the later does not do so. The karmas are also forces that support the bodies of the being and this gives another basis of defining karmas. The *aghati* karmas determine the biological structure of the organism and its operation and the *ghati* karmas determine the psychical performance of that being. So the two groups are

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

The psychical karmas may destroy the fundamental nature of soul fully or partially. It may be mentioned that the fundamental quality of soul is never fully obscured. If that were the case, the soul would lose its basic character and became as good as an inanimate object.

The effects of psychical karmas can be briefly summarized as follows [7].

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

3 Determine the level of intelligence, knowledge, wisdom, perception, will power, and determination

4 Determine faith, philosophical and spiritual qualities

5 Determine personal and social conduct and behavior

Biological karmas have a wide variety of functions ranging from the type of realm of birth to the minutest details of the body. These karmas can produce all possible types of bodies of all species, all possible variations in bodies of a given species, all different features like outer appearance, deficiencies, voice etc., autonomic and physiological functions, and structural quality of the body. The feeling producing karma may operate at mental or body level to produce mental or body oriented pleasure or pain. The age determining karmas have a temporal character and may be connected with *prana* body.

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

The eight main types of karma are further divided into sub-types; the total number of sub-types is 148 [8]. Each of the sub type of karma can vary in grades giving a large range of karmas which become the basis of differentiation between individuals and diverse kinds of living beings. The difference in karma makes each individual a unique personality that has no parallel in past present and future.

Rise of Karma

The bondage of karma and rise of karma is a continuous process. Some activity of mind, body and speech is generally taking place every moment meaning thereby that karma is active. The rise of karma takes place in two ways. (1) Rise of karma on maturity of the duration of bond period, and (2) rise of karma before the maturity period on the initiative of the soul [9]. The rise in the first case is called '*udaya*' or 'the rise'. The rise of the second type, called fruition or *vipaka*, due to *purusartha* relates to exercise of free will of the soul. In the first case of *udaya* the soul experiences the consequences of

the rise spontaneously without invitation. The second case is voluntary action of the soul and the experiences are made due to self initiative. All karmas cannot be aroused prematurely. It is only those karmas which have become capable of being aroused prematurely can be subjected to premature rising. The criterion for such capability is determined by the varieties of premature arising of karmic type, karmic duration, karmic intensity and karmic units.

Fruition and rise of karma is responsible for all worldly life and therefore its study is of great practical importance, particularly from scientific point of view. Life flourishes because of fruition of karma and to study life we must know why and how karmas get fruition.

Nimitta or auxiliary cause plays an important role in fruition of karma. Let us elaborate little more on the cause. A cause is that which affects the action, action does not take place without a cause. There are two types of causes for any action to take place [10].

1 The Main (*Upadan*) Cause. It is the cause that transforms into action. This is also called the substantive cause.

2 The Auxiliary or Efficient (*Nimitta*) Cause. It helps the action to take place, it motivates the main cause. During action the auxiliary cause does not transform into the main cause and is therefore not destroyed (it is like a catalyst). However the auxiliary cause influences the main cause.

Auxiliary causes are of two types;

(1) Karma is the main auxiliary cause

(2) *Nokarma* is the supportive auxiliary cause in rise of karma. This again is of two sub types [11].

a. Bonded *nokarma* e.g. fiery body and gross material body

b. Non-bonded *nokarma* – external objects like family members, contacts, wealth, property, society, geological, climatic and environmental conditions etc.

Jiva and karma have the relationship of being the main cause and the auxiliary cause mutually i.e. soul transforms by its own cause as well as by the effect of karma and karma changes by its own cause as well as due to activities of the soul.

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

Bondage of karma is important from spiritual point of view but fruition of karma is important from the scientific point of view. Fruition can take place on self - initiative

by the soul or on soul meeting an auxiliary cause, *nimitta*, which can be one or more than one at a time. *Nimitta* can be internal, the impurity of the soul itself, or an external object, living or non-living with which the *jiva* interacts. Fruition of karma is a continuous process; it may take place due to one or more causes, both internal and external. Also, one type or more than one types, generally up to all eight types of karma, experience fruition at a time.

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

Fruition of karma takes place in four ways (a) fruition in space (*ksetra-vipaki*), (b) fruition in *jiva* (*jiva-vipaki*), (c) fruition in particular realm of life (*bhava-vipaki*), and (d) fruition in body (*pudgala-vipaki*) [12].

Fruition in space: Truly speaking all fruition takes in space but some karma subtypes are specially placed in this category. The *Anupurvi nama* karmas are of this type, they get fruition during migration of soul from present life to next life. Presumably fruition of these karmas provides the necessary force for *jiva* to move from present location to the next destined location.

Fruition in Jiva: The *jiva-vipaki* karma subtypes fructify in the soul directly i.e. fruition first takes place in the *bhava*-karma and are simultaneously followed by fruition of *dravya* karma. *Jiva-vipaki* karmas are of 78 subtypes.

Fruition in a particular realm of existence: The age determining karma belongs to this category. These subtypes get fruition in the next birth.

Fruition in body: These karmas consist of subtypes of body forming karma; their fruition takes place directly in the body. This fruition determines the structural and functional aspects of the body. Gommatsara Karmakanda mentions 62 subtypes in this category. *Vedaniya* karma is both *jiva-vipaki* and *pudgala-vipaki* types.

The above division of karmas is of special significance. It shows that fruition of all *ghati* karma directly takes place in the soul and influences its natural powers and performance. Further, fruition of some other karma like status determining karma, feeling producing karma and some form producing karmas also directly affect the soul. The *pudgala-vipaki* form producing karma which get fruition directly in the body are very likely related to bio photon emission, as shown below, discovered by scientific studies, both of these are concerned with processes taking place in the body.

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

In the waking state the conscious mind controls the mental and physical activities and these activities are organized in a meaningful and purposeful way. This is achieved by choice and selection of *nimitta* both internal and external. It means that the conscious mind has regulatory function in fruition of karma; the fruition of karma is not entirely arbitrary. Of course, the *nikacita* karma has no control of the conscious mind and the *jiva* has to experience the fruits of their rise. *Upasaman* is an important method of controlling fruition of karma, by this way the *jiva* changes the choice of selection of *nimitta* and temporarily postpones the fruition of karmas which were otherwise due for fruition. It may be noted that fruition of karma and choice of selection of *nimitta* are mutually dependent, and one leads to the other; which one occurs first depends on the circumstances. Sometimes fruition of karma leads to choice of *nimitta* and sometimes it is the other way round. In any case the two are closely interrelated and mutually influence each other.

The following are the possible effects of rise of karma [13].

1. *Jnanavarniya* karma. The soul fails to know, in spite of curiosity, the subject of relevance. His sensual perception is veiled.

2. *Darsanavarniya* karma. The soul fails to become aware, in spite of being alert, of the subject in sight. Either his sensual perceptions are blocked or he goes in sleep state.
3. *Sata vedaniya* karma. The soul experiences pleasure in the form of words, sight, smell, taste or touch of liking or favourable mental, verbal or body conditions.
Asata vedaniya karma. The soul experiences pain. This could be as unpleasing words, sight, smell, taste or touch or adverse mental, verbal or body conditions.
4. *Mohaniya* karma. The soul experiences perverse state and fall in character. He could suffer from lack of righteousness, perverseness, or both, and attack of passions and quasi-passions.
5. *Ayusya* karma. The soul incarnates in a particular form. These forms could be as infernal beings, heavenly beings, animals or human beings.
6. *Subha nama* karma. The soul experiences higher physical and verbal conditions. He may have superior speech, looks, smell, taste, touch, movements, position, beauty, fame, physical strength, courage, valour, and melodious, impressive, effective and mentally pleasing voice.
Asubha nama karma. The soul experiences lower physical and verbal conditions. He may have inferior speech, looks, smell, taste, touch, movements, position, and loss of beauty, fame, physical strength, courage and valour, and harsh, unimpressive, ineffective and mentally displeasing voice.
7. High *gotra* karma. The soul experiences states of elevated class, family status, power, position, industrious working, scholarly achievements, gains and prosperity.
Low *gotra* karma. The soul experiences lower states of class, family status, power and position, loss of hard working nature, scholarly performance and prosperity, and suffer losses.
8. *Antaraya* karma. The manifestation of soul powers is obstructed. It obstructs acts of charity, gains, enjoyment, pleasure and spiritual initiatives.

Working of Karma

For any worldly activity subsidence-cum-annihilation (*ksayopasama*) of psychical karma and rise of biological karma is essential. The soul enjoys favourable conditions on subsidence-cum-annihilation of psychical karma and rise of auspicious biological karma and faces adverse conditions on rise of psychical karma and inauspicious biological karma. For any event in life proper combination of subsidence-cum-annihilation of all four psychical karma is required.

We explain the working of karma with the help of an example. Suppose you are enjoying music. At this moment biological karmas are on rise. The age determining

karma is on rise so you are alive to listen to music. The form producing karmas are on rise so your body is in proper working condition, ears are receiving sound and brain is transforming the sound signals into suitable input for you to understand the music. The rise of feeling producing karma is producing good feeling in you and rise of status determining karma is helping you to have a sense of good performance, a feeling of having access to good music. The physical karmas are in state of subsidence-cum-annihilation. The ocular and non-ocular awareness obscuring karmas are being annihilated so that you are aware of the music and annihilation of empirical and articulate knowledge obscuring karma enables you to cognize the music. The deluding karma may have either subsidence or annihilation, normally the former holds good. The wrong belief deluding karma is under subsidence so that you perceive the music as a source of sensual enjoyment. Your ego passion allows the soul to have a feeling of possessing this good music album. Your indulgence quasi-passion karma allows developing liking for the music. The enjoyment and re-enjoyment karmas have annihilation so that so that there is no obstruction in enjoyment. In this example the soul is the enjoyer and is the main (*upadan*) cause for the act. Karma body, fiery body and the physical body are the principal auxiliary cause as these help the soul to enjoy. The music system and favourable environment are other auxiliary causes that make listening to music possible.

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

Another important aspect of the doctrine of karma is that while the existing karma are annihilated or subsided new karmas of the similar type may bond. The soul in any activity is agitating and the karma body is vibrating. The vibrating karma body attracts karma *varganas* of the kind which are active and bonds with new karma due to active passions. On analyzing our experience we find that we pay maximum attention to our feelings whether we are feeling good or bad. Our next attention goes to our perception of the experience, our desires, our emotions, our liking and disliking and satisfaction of our desires (ego). Therefore the highest amount of karma we bond with is feeling producing karma [14]. Next higher in order is deluding karma. In practice seven types of karmas bond at a time, the age determining karma bonds only once in life time and has least proportion out of the eight karmas. The net gain of karma in the karma body may be positive or negative depending on the amount of karma being bond and that being annihilated. It is because of this that the soul is normally not able to get rid of karma in a normal way. For reducing the karma balance the soul has to stop inflow of karma. To achieve this, the soul must control his passions, which in the above example means giving up the feeling of ego and liking. For example the soul has to stop enjoying

music; he should consider music as any other sound and take no interest in it thinking that this is the cause of endless migration in the world. He has to develop a feeling of detachment to worldly pleasures which do look attractive for the time being but ultimately bring sorrow and misery in the long run. This amounts to renunciation which in fact is the way to achieve the state of permanent bliss, a state of inner realization.

The Living System

A living being commonly has three bodies – physical (*audarika*) body, fiery (*tajasa*) body and karma body. The physical body is visible but the other two bodies, fiery and karma bodies are invisible. The karma body contains karma as we now know. The fiery body comprised of fiery *vargana* is supposed to be electric body. The fiery body has two important functions to perform: (1) Management of the body systems, and (2) To support and provide control on the physical body[15]. The karma body and the fiery body never depart and both of them are always united with the soul. This union is maintained till the soul attains the state of emancipation. The liberation of the soul is, in fact getting freedom from the imprisonment by these two bodies. Kirlian photography has shown that a luminous body leaves the physical body at the time of death confirming the existence of some kind of subtle body.

A simple model of living system is shown in figure 1 [16]. The system consists of three bodies, the karma body, the fiery body and the physical body. The soul pervades the entire space of the body, it manifests in all the three bodies. Karma body is closest to soul and consciousness and powers of the soul are first manifested in it. Fiery body acts as a link between the karma body and the gross body, which converts these powers into physical actions and interacts with environment. Thus by means of this system of interfacing bodies the soul interacts with the environment and vice versa. The environmental effects are first communicated to gross body and they reach the soul through the fiery body and the karma body.

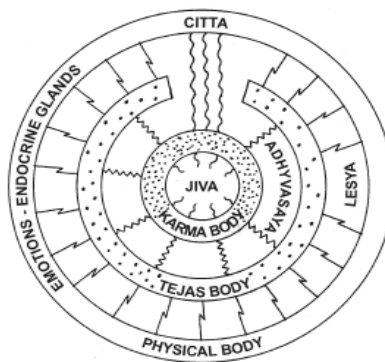


Figure 1 The Living system

The *bhava* karma comprises of psychical *bhava* karma and biological *bhava* karma. Some of the *bhava* karmas which are in fruition (or rise) are active at every instant. The active psychical *bhava* karmas are supposed to constitute the *bhava manah* or the psychical mind. The agitations or vibrations in the psychical mind due to passions are called *adhyavasaya*, which bear the characteristics of the karma active at that instant [17]. The vibrations in the soul due to rise of biological *bhava* karma are also named as *adhyavasaya* but these are of different kind. *Adhyavasaya* continuously changes with time and *nimitta* plays important role in this change as mentioned above. Good or bad *nimitta* produce good or bad *adhyavasaya* respectively. The *adhyavasaya* vibrations in the soul induce similar vibrations in the karma body as the principle of parallelism holds good. The events in the soul and karma body take place simultaneously. The rising psychical *adhyavasaya* and biological *adhyavasaya* must operate in different ways. The psychical *adhyavasaya* interact with the fiery body and produce another kind of vibrations called *lesya*. The biological *adhyavasaya* are supposed to interact directly with the body cells, most probably with DNA and its structural protein, and regulate (and control) the gene functions, the biochemical activities, autonomic functions and other body related functions. The *lesya* represent our *bhava* or emotions, thoughts and attitude. Some of the *adhyavasaya* bypass the fiery body and directly interact with the brain. This interaction produces physical imprint of our past memories and impressions in the brain, which is *chitta* in the physical form. The *adhyavasaya* themselves are subtle *citta* and comprise of the following four aspects of our personality (1) Non-righteousness or perversity (*mithyatva*) (2) Non-restraint (*avirati*), (3) Non-vigilance (*pramada*) and (4) Passions (*kasaya*). The non-righteousness distorts the 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, etc. The non-vigilance aspect of the *citta* develops attachment or delusion. These all are our internal creations and have no relationship with the physical body or brain. These characteristics originate from *adhyavasaya* or karma.

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

Lesya provide connection between the subtle body and the physical body [18]. They work in both directions. They pick up signals from the karma body and transmit

them to the mind and the physical body. On the other hand whatever is performed through activities of mind, speech and body is communicated by *lesya* to the karma body.

The *lesya* are of two kinds – *dravya* (physical) *lesya* and *bhava* (non-physical) *lesya*. The physical *lesya* are radiations and the *bhava lesya* is the perverted state of the soul. The physical *lesya* in the form of radiations have colors and are classified on that basis. There are six kinds of *lesya*. (1) *Krsna lesya* – Color is dull blackish (2) *Nila Lesya* – Color is dark blue (3) *Kapota lesya* – It has grey pigeon like color. (4) *Tejo Lesya* – Color is bright red. (5) *Padma Lesya* – Color is bright yellow. (6) *Sukla Lesya* – Whitish bright color. Each kind of *lesya* represents some specific qualities of the organism corresponding to the state of the soul or active *bhava* karma. The first three types are the malevolent *lesyas* and indicate negative qualities or emotions. The last three types are benevolent *lesyas* indicating positive qualities of the being.

Lesya change with time and only one *lesya* is present at any particular time. Human beings and animals can have all the six *lesya*. Hellish beings have only malevolent *lesya* and higher celestial beings have only benevolent *lesya*. *Lesya* are influenced by colors. Colors have a profound effect on our feelings and thoughts. Psychologists assess the characteristics of a person based on his liking for color.

In the human body system the *lesyas* are supposed to 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 influence and control our, emotions, thoughts, attitude, speech, conduct and behavior in the physical plane. Thus the active psychical karma through *lesya* and hormones determine our psychical personality and traits. The endocrine glands are seen to provide a system that establishes link between the subtle body and the physical body. These glands convert the information from the karma body, in radiation form, into chemicals which finally control the body and the brain.

We can speculate on the working of the body system now. The *karman vargana* attracted from cosmos by resonance action convert into karma by the bonding process in the karma body. Karma exists in this form for a certain period determined by the bonding conditions and on maturity is emitted as radiations known as *adhyavasaya*. These karma radiations interact with the fiery body to produce *lesya* radiations. As karmas are distinguished by frequency the *lesyas* also exist in a range of frequency. This justifies classification of *lesyas* by colour. These different frequency *lesyas* interact with DNA, which besides having chemical composition also has been found to possess vibration character and working as holographic computers. The fiery body is also formed

by *taijasa vargana* as a bio plasma body that emits radiations to perform the management and control functions, one form of this being as *lesya*.

From the foregoing we note the following important roles of karma.

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

Relationship between Karma (in fruition) and Body

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

1. Bio-photons [19, 20]: It has been found in laboratory experiments that all living systems emit a weak light current of some photons which provide energy for chemical reactions in cells and regulate the whole biochemistry and biology of life. The source of this light is said to be a coherent photon field whose source is not known with certainty. The bio photon emission is indicative of an endogenous, innate, electromagnetic field pervading the entire organism. Bio photon emission is thus seen as a crucial evidence of a physical basis of life. According to Jain philosophy *nama* karma is responsible for structure, design, development, maintenance and activities of the body. Thus a relationship between bio photon emission and *nama* karma and other non-obstructing karmas is speculated. These karmas may be connected with the functioning of DNA which is supposed to be the basis of life. It is possible that this connection is made through the fiery body so that the energy of this body is used in affecting the processes in the gross body.
2. Conscious mind: Psychologists believe in the existence of conscious mind which is different from the brain. Scientists are of the view that brain itself acts as conscious mind. The brain receives and sends signals to every part of the body and thereby controls the activities taking place in the body. In our model given above the conscious mind (*dravya manah*) is formed by fruition of obstructing karmas and is connected to brain for its functioning. Therefore it is envisaged

that obstructing Karmas play a great role in controlling the activities and functioning of the body system.

We now briefly present possible roles of different karmas in the body systems.

1. *Jnanavarniya* and *Darsanavarniya* Karma. These two types of karmas are responsible for cognition activity. As this activity is assigned to brain and nervous system in medical science, these two karmas are supposed to be related to functioning of the brain and the nervous system through the conscious mind.
2. *Mohaniya* Karma. Perception is mental actively in medical science. Therefore perception deluding karma determining our belief system should be related to functioning of the brain. Emotions are closely related to secretion of hormones by the endocrine glands. Hence the conduct deluding karma determining our desires and emotions must be related to functioning of the endocrine gland system. The pituitary and pineal glands and hypothalamus located in the brain are found to control the functioning of other glands in the body. So the perception deluding karma through its influence on the brain is also expected to affect our emotions and desires.
3. *Antaraya* Karma. Our willingness and/or resistance to perform an act is assumed to be governed by the conscious mind. *Antaraya* karma is related to mind states like disinterest, grief, worry etc. and unhealthy body conditions. The *antaraya* karma therefore is expected to influence the function of the brain.

Please it may be noted that the above four obstructing karmas operate through conscious mind. When these karmas are eliminated in the omniscient state the conscious mind becomes redundant. In this state the psychological mind and as also the unconscious mind cease to exist; the *dravya manah* or conscious mind physically exists but it is rendered non-functional as the *jiva* no longer needs it. The perception and cognition is made directly by *jiva*, and the conscious mind and the brain have no role in it.

4. *Vedaniya* Karma. Production of pain is seen to be related to the state of tissues in the body and experience of pleasure has some connection with secretion of hormones. The state of tissue is connected to local chemical activity and performance of genes. So it can be speculated that *vedaniya* karma influences functioning of the genes, local chemical activity and secretion of hormones by endocrine glands. As secretion of hormones also depends on the state of conscious mind *vedaniya* karma and conscious mind together must produce pain and pleasure that the *jiva* experiences.
5. *Nama* Karma. Biological science has shown that genes carry the code according to which the design, construction, structure, growth and development of the body takes place. *Nama* karma therefore provides the essential ingredient for

this function. Different subtypes of *nama* karma describe in detail how the architecture of body is decided, and the parts, organs and organ-systems are built to develop body structure in a systematic and pre determined way. This karma also decides the growth, maintenance and activities of the body.

6. *Gotra* Karma. The quality of performance of the body system is also ascribed to behaviour of genes. The *gotra* karma therefore must play an important role in the performance of genes. The way in which the gene code works and controls the anatomical and physiological functions, performance of body parts and functioning of the living system is therefore also dependent on *gotra* karma besides *nama* karma.
7. *Ayusya* Karma. The *nama* karma is believed to have a master code for design, construction and actions of all kinds of species found in *loka* (universe). The *ayusya* karma seems to tap a specific code from this pool and proceeds with design and construction of one particular form according to *ayusya* karma bond in the previous life. Another important aspect of life which is particularly emphasized in eastern philosophy is *prana*. Also, blood is supposed to be life line of a living system. Is *ayusya* karma is related to production and circulation of blood and role of *prana* in the body? *Pranayama* has been found to increase blood circulation in the body suggesting a relation between *prana* and blood supply. On death *prana* leaves the body and production of blood stops.

Besides creation of structure and maintenance of bodies the system also has arrangements for defense of the body against possible dangers from environment, bacteria, virus, and other harmful organisms and internal malfunctioning and disorders in the system. The body has inbuilt self-healing mechanisms to cure and protect itself from these dangers and survive against all odds to the best possible extent. The body is a wonderful system that creates structures, maintains and protects the system with minimum inputs in the most efficient and optimum manner and in very versatile way in the sense that it can cope up with highly diverse situations. The body has several levels of operation which are chosen according to the internal conditions, environment and available resources. The structure of the body depends on the development of consciousness and the activities of consciousness are a function of structure of the body, in particular the brain. This is because the soul and body are connected intimately and there are two way interactions. So versatile is the design of the human body that it is impossible for human mind to design and build even a small part of the system: the entire system is well beyond comprehension of human mind.

Connections between the Bodies

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

- a) Gross-gross body bond meaning that parts of the gross body bond together
- b) Gross-fiery body bond meaning that these two bodies bond together
- c) Gross-karma body bond meaning that these bodies have bonds between them
- d) Gross-fiery-karma body bond meaning that these three bodies are also bound together.

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

The karma body and *taijasa* body are made up of *karman vargana* and *taijasa vargana* respectively and are of electric nature, or some kind of electric fields. The two bodies therefore are supposed to have an affinity or some kind of electrical attraction. A third unit of conscious mind (*dravya manah*) made up of *mano vargana* comes in existence in five sense beings. This *vargana* is also of similar kind and hence the three units combine together to form a subtle combination unit. The three kinds of *varganas* perform different kinds of functions according to their specific properties but are spatially not separated since they occupy the same space as the space of the gross body and the soul. The working of the conscious mind is different from that of other two subtle bodies in the sense that it is dependent on the structure of the gross body. Mind works in conjunction with the brain and the nervous system and in the absence or malfunctioning of this system the mind in spite of having potential cannot deliver the output. This is not the case with karma body and *tejas* body as these are unaffected by the structure of the gross body.

Besides having mutual connections the three units are also connected to the gross body due to interaction and interchange of *varganas*. In the beginning of life cycle the *taijasa* body is the first to make contact with the fertilized egg that is the fertilized egg is infused with *prana* energy from the *taijasa* body because of the *ayusya* karma of the soul taking birth. The *nama* karma then decides the structure and further growth of the body. All the karmas are supposed to be transferred to the gene structure of the egg cell by the process called *paryapti*. The subtle energy of *taijasa* body known as *prana* is the essential ingredient for structure and functioning of the gross body and there is intimate connection between the *taijasa* body and the gross body. *Prana* flows to the gross body and it is distributed to other parts through *prana* channels known as *nadis*. In this manner the gross body is energized for its functioning. The karma body on the other hand is intimately connected to the soul but is also linked to the *taijasa* body. Thus the soul has primary connection with the karma body and secondary connection with the

taijasa body. The karma body is connected to the gross body through *taijasa* body and also through the conscious mind as shown below.

The conscious mind is a derivative of *ghati* karma and it functions in conjunction with the brain and the nervous system as mentioned above. So the conscious mind is intimately connected to the gross body on one hand and to the karma body on the other hand. Thus the *taijasa* body, conscious mind and the gross body are connected to karma body in various ways. Connection of these three units with the soul is made through the karma body.

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

At the time of death *ayusya* karma is completely exhausted and the connection between the *taijasa* body and the gross body is snapped. The brain stops working and loses connection with the conscious mind. The connection between the conscious mind and the *taijasa* body is also snapped as this needs working brain. So when the soul

leaves the body the conscious mind does not accompany it and only the karma body and the *taijasa* body transfer to the new body. Therefore, the conscious memories are not carried forward to new life. However the information in the karma body, the unconscious mind, is carried forward. In the absence of gross body the chakras do not exist in the transition period between the lives and these are formed again in the new body according to its structure.

It is interesting to know what happens when the soul transfers from one body to another in its life time, a feat that can be performed by some yogis having that kind of power. In this case the *ayusya* karma is in balance and the connection between the brain and the conscious mind is not snapped. Therefore the conscious mind is also transferred to the new body along with the karma and *taijasa* bodies. How the conscious mind works in the new body depends on its structure. Suppose a human soul transfers to another (dead) human body then a proper brain structure is available. The *taijasa* body and the karma body get connected to the new gross body and the conscious mind functions according to the existing brain structure. On the other hand if a human soul transfers to an animal body say a lion (dead) the karma body and the *taijasa* body get connected to the new gross body as before but the conscious mind suffers limitations of the brain structure available in the lion's body. Although the soul continues to feel existence of human form through the conscious mind the functioning of the mind is impaired. The soul now thinks as a human being (purely mental activity) but can only perform physical activities of a lion compatible with available body and brain structure. The behavior of this lion will of course be different from normal lions and will have many thinking attributes of human being.

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

Karma and Genes

Once Gandhara Gautama asked Lord Mahāvira: *kammaṇan bhante jīve no akkammaō vibhakti bhavan pariṇamaī*. There is dissimilarity in the whole world, some possess less knowledge and the other possesses more. What is the reason for this? Mahāvira replied, "*Karma* is the cause of this dissimilarity." If a biologist of today is asked this question, he will say that gene are responsible for all dissimilarities [21]. The characteristics of genes and chromosomes determine the human personality. According to genetics, every gene contains six million orders and as per doctrine of *karma* infinite instructions are written on each karma *pradesa* [22]. Thus the function of biological *karma* resembles the function of genes. Rather the concept of *karma* goes one step ahead in the sense that apart from transporting the hereditary influences over many

generations of both the parents it also takes into account the effect of individual performances in the previous births.

Every cell of a multi-cellular organism contains the same blue print but in different type of cells, e.g. skin cell, nerve cell, bone marrow cell, etc., genes operate in different ways according to the body requirement. These genes are supposed to be directed by the rising biological *karmas*. In every cell similar type of genes exist, but some genes remain inert and some are active during a certain time. This process is very complex. It is believed that in developed complex beings up to 2-15 per cent genes remain active at a time [23]. In reality the karma decides which genes are active and which are inactive. The control is exercised through hormones, vitamins, minerals, chemicals and immune system. It is believed that the genes are controlled by the environment around it, cell nutrition wrapped around the genes, and the temperature of the light. Thus, genes are said to be the deciding factors for the various characteristics of a living organism and these are controlled by some known or unknown causes which are in fact karmas of an individual.

According to the modern anatomy, all creatures have originated from the same building block of life [24]. It is only due to mutation of the genetic codes that different types of species—right from amoeba to man, take birth. According to Ācārya Mahāprajña "the theory of *samkramaṇa*," i.e. theory of transformation of karma, is somewhat similar to the theory of mutation of genes though they differ widely in scope.

Every human embryo contains 23 chromosomes of father and 23 chromosomes of mother. The biologists guess that due to the interaction of these all chromosomes-16, 77, 216 kinds of similarities are expected [25]. Today, through the genetic mapping, all the genes which control the various states of our traits have been discovered. We have also discovered all the sequences of genes set up and everyday new researches are revealing new knowledge about the genes.

A group of researchers led by Paul Thomason of the University of California of Los Angles has given clear evidence that intelligence is largely determined before birth [26]. Still the puzzle, regarding all the traits of human beings, has not been fully solved. On the other hand the Jaina *karma* theory determine not only the characteristics of the body of the organism but also its other characteristics like intelligence, happiness, sorrow, perception, age and performance.

It is certain that mental as well as intellectual merits of genes are necessarily affected by a man's pre-birth internal state, i.e. nature, and also by the after-birth outer environment such as air, temperature, light, moisture, nutrition, etc., i.e. nurture. If two identical twins are kept separately in different outer environmental conditions, their body structure, their personality and mental characteristics will greatly differ from each other despite the fact that both have the same genome structure and similar

development of the embryo in similar internal environment. These factors clearly indicate towards *karma*—the controlling factors and existence of soul [27].

One important thing is that the rise of *karma* takes place according to an auxiliary cause. Let the pain-causing *karma* rise at the same time in two different persons, if one person listens to religious sermons and devotional songs and the other one is kept in a closed room doing nothing then the rise of pain causing *karma* will cause more pain to the second person in comparison to the first person [28]. In another example if two children are born to a mother, one in some cold country and the other in some hot country, the former can comparatively be fair than the other child. If some person begins to live in a cold country, his complexion will change to fair. Thus, we see that the personality of an individual depends not only on *karma* but also on heredity, environment, and geographical location and ecological conditions i.e. no-karma.

Karmic Expression- an Analogical Analysis

Karma is a set of codes which design the state of a being. The soul imbibes the karma and the karma responds to the soul. There must be a process or method by which this physical karmic code expresses it? For example if a book has a recipe of tea written in it, that does not prepare the tea. What is the process of karmic expression for execution?

The challenging task of unveiling the tacit knowledge of the process of existential karmic particles becoming karmic expression is the attempt here. Existential reality which is a static force (in the state of *anudaya*/ non-fruit) becomes a dynamic force supported by a mediator usually. The dravya, kshetra, kaal, bhaav and bhav (DKKBB) are five components which aids in the karmic expression. DKKBB can be analogues to an enzyme which serves to bring about the whole chemical reaction, enzymes work as a mediator. The DKKBB though plays the role of an enzyme is not chemical but could be very dynamic like temperature, weather, geographical conditions, life style and more.

Karmic decoding

Karma is decoded to express. Decoding, in semiotics, is the process of interpreting a message sent by an addresser to an addressee. The complementary process – creating a message for transmission to an addressee – is called encoding.

Although the addresser may have a very clearly defined intention when encoding and wish to manipulate the audience into accepting the preferred meaning, the reality is not that of textual determinism. What is decoded does not follow inevitably from an interpretation of the message. Not infrequently, the addressees find different levels of

meaning. Umberto Eco called this mismatch between the intended meaning and interpreted meaning aberrant decoding.

In regards to karma, the encoded message decodes depending on the activity of a person (*nimitta*). The person's own psychological state can make a difference. This apparent relativity of communication between the karma and the bearer of the karma may result from the fact that they are of a different social class or because they have different training or ability, because they have different world views or ideologies, or because they are from different cultures. David Morley argues that the outcome of decoding will be influenced by pragmatic issues, i.e. whether:

- the addressee has the ability to comprehend the message in its entirety
 - The soul too when stressed out loses the opportunity to enjoy the *satavedaniya* karma i.e. happiness.
- the message is relevant to the addressee
 - Soul or consciousness is in the mode of receiving it like when one is fasting, the person is in the mode of receiving *asatavedaniya* karma.
- the addressee is enjoying the experience of receiving the message; and
 - The deluding karma when is intense, and consciousness being stupefied enjoys the delusion, karma is fully forceful.
- the addressee accepts or rejects the addresser's values
 - Consciousness rejects or sends a contradictory wave of energy when karma sends a message. Like when *mohaniya* karma pollutes the mind, the consciousness makes an effort to defy it by meditating.

Further, Umberto Eco [29] suggests a distinction between *closed* texts which predispose a dominant interpretation and more *open* texts which may have latent meanings or be encoded in a way that encourages the possibility of alternative interpretations.

This physical law fits well into the spiritual laws also. There are karmas which are unamendable and closed text which cannot be manipulated or amended; these are *nicachit* karma while that non-*nicachit* karma is kind of open texts which can be regulated by the addressee. The message decoded will make a difference depending on the addressee which is the soul or the body and the mediator i.e. DKKBB. The soul by its will power can defy the message or augment it. The fever to two people varies by the mode in which the message is received. One kind of takes it easy and stress free while the other is burdened and intensifies the experience. Here the claim is not that taking easy is a good act or not taking easy is negative. Here simple attempt is only to reflect

the difference of addressee. Hence the Jain theory of karma is not deterministic in approach but geared towards self-selection.

Further, the karmic language seems to be like Sanskrit and Latin which does not carry any syntax rather than like English as it is a coded message. The reasoning behind delegating it as coded language is its message pattern. Though karma is very structured the message expression is not like two plus two four. For example if one has 2+2 mangoes, it turns out to be four mangoes and if it is 2+2 balls, then four balls. Hence we see a pattern of four is common in these but the expression varies based on object which assists in the expression. Applying similar situation in karma theory if a person has to suffer *vedaniya* karma, the person can have thyroid or diabetes. The result depends on the suitability of the conveyance. This explicitly reveals the karmic expression goes by the way of availability; the availability is usually defined by DKKBB or even the support system of the other karma. Can it be un-coded as per quantum effect?

Karmic phenomenon of epistasis and pleiotropy

The karmic expression can be divided into two platforms-physical and psychical. Depending on the direct target the karma is titled as *ghati* and *aghati*. The *ghati* are those karma which are directly targeted to the soul hence are psychical in nature while the *aghati* are those which target at the physical level. Though this categorization kind of dissolves at times or gets blurry, yet helpful to apprehend the two categories of karma. Like the *jnanavarniya* karma impacts the cognitive ability which can also be visible at the physical level of impaired brain efficiency. Here, the brain efficiency is an indirect result or in other words is a mediator result. The *jnanavarinya* karma's key role is not brain impairment but rather cognitive impairment. To bring about this at times, the physical conditions are required accordingly which is assisted by the *nama* karma. Here we find that multiple karmas work together to make this happen ultimately. Hence epistasis process works here. Epistasis is a phenomenon about the effect of one gene being dependent on the presence of one or more 'modifier genes' (genetic background) [30]. A similar kind of function is observed in karma as well. Any karma to manifest in action or physical level will need the assistance of *nama* karma.

The *vedaniya* and *mohaniya* though distinct karma needs to work with *nama* karma like *vedaniya* karma leads to disease, the body is suffering from some illness. In another example, when one is angry and body is shaking, here the anger could be an expression of *mohaniya* karma while body is the seat of its expression and related to *nama* karma. Here we see the intertwined nexus of performance which is a phenomenon of Epistasis.

Pleiotropy [31] is another phenomenon we can find in science and philosophy; it describes the genetic effect of a single gene on multiple phenotypic traits. The underlying mechanism is that the gene codes for a product that is, for example, used by various cells, or has a signaling function on various targets. Similar functionality could be observed in karma as well. The *nama* karma has different types of roles undertaken, to regulate skin color, height, body size and more. Further if we analyze this phenomenon from a different perspective, *vedaniya* can manifest as a thyroid or heart disease, all depends on body readiness. The karma manifest at a location; if a person has pancreas tired of functioning one can be hit with diabetes, while thyroid if that is easily targeted. Or, it could be genetic message about the diseased state of the pancreas or thyroid which makes it happen. The genes work as a DKKBB here to regulate the expression of karma. Further, depending on the kind of epistasis support of *nama* karma, the *vedaniya* manifest. This analogy expresses not only the web connection of different karmas but also the idea that though karma can be simplistically similar it may express very differently hence it is not deterministic in nature.

Karmic expression

The interface of matter and soul is unknown but yet visible. Here is an attempt to present three theories to apprehend this invisible -visible functionality of karma. The possible postulates are:

1. Secret theory
2. Mediator theory- the karmic fruition is mediated by certain DKKBB (*nimitta*). They could be both internal and external.
 - a. External – a person is sick during cold weather
 - b. Internal – lack of immunity and hence diseased.
3. Epistemic transfer – transfer of message

The karmic energy is pulled up by the soul's effort. This karmic energy while ready to express, needs a receiver and a mode of communication or expression. A similar situation is faced by science when we make a claim that our genes govern us. There is a process of gene expressions. Genes express the message to the body or person, they being the receiver. The exchange between them is a crucial dialogue. The genes carry chemical language. Genes replicate to produce RNA. The RNA serves as a messenger /mRNA to produce certain kind of proteins. Many biological activities are carried out by proteins. The accurate synthesis of proteins thus is critical to the proper functioning of cells and organisms. Depending on the protein synthesis one can define one's state of being and health as well. Like dopamine is related to happiness.

Secret theory

When the process is unclear, it is delegated as secret. As Feynman's statement – physics just describes what we see, so quit trying to understand why things look the way they do and just describe what is there. In other words, physical science is a description of what we have observed and not “why” or the “how” [32]. Secret is a term used when we do not know the functionality, possibly when manifestation of energy is subtle and invisible. The unanswered question of how karma really brings about a diseased state or depression or any of these is beyond the realm of sensual world and hence there is a need to explore the subject from a different dimension.

Science with its quantum mechanics might prove a little help. The karmic particles have certain message coded within it. As we are dealing with karma which is a complex structure, the principle of uncertainty (entwined with quantum physics) does not relate with it. The karmic message is not uncertain in context of type of message and time of message i.e. when will it execute the message and what kind of message is certain, though the question of where might dependent on DKKBB.

Further, the quantum nature of atom which reflects its atomic and wave nature can help us analyze the nature of excitement and message transfer. Could it be possible to say that the karmic particles are in particle form during its dormant state and transforms into the wave nature when ready to express or decode its message, or just say karma is karma, like the author Travis S Taylor mention, light is light, reality is whatever reality is. Wave and particle form are not actual forms but properties of the light. One will observe, depending on what one is looking for. Wave and particle are mere mathematical tools [33].

It is like a karmic design-

As per science of the secret, When you have a new thought, you are setting up a new quantum state. With each thought a new qwiff (quantum wave function) is generated that begins interacting throughout the universe. Your new thought continues to interact with the universe and with other qwiffs in the universe that are similar to it until a new entangled and common qwiff “coheres” and becomes the next instant's reality. This is the essence and the heart of the Secret [34].

Could we describe, the karmic message is sent into the space which intensifies and manifest in a quantum manner? Here the mention of Acharya Mahaprajna exemplifies in his book, Mahavira's health scripture. He states that the kind of energy is generated within us, in accordance we pull the energy from outside. The asymmetry which actually lies between the inside and outside is balanced out soon. It is something like homeostasis, where we tend to reach the point of equilibrium set up by the karma, without questioning the set point. This inside energy designs such that our outer energy is pulled accordingly. As we take the energy from outside, we have accordingly the

health or disease status. Like when the *asata-vedaniya* karma generates its vibrations, the energy one pull from around synchronizes with it, hence diseased accordingly. Conclusively, when karma and environment are in asymmetry, the either influences the other. At times the environment triggers the karma when *udirana* takes place, at other situations the karma triggers the environment (in the body) bringing about a causal effect.

Mediated and non-mediated expression theory

There are two types of karmic expression, mediated and non-mediated. The mediated can be internal or external. Mediated is at specific platform being it body or mind or environment, mediated through genes, body or any conditions availed.

Non-mediated is in the virtual world. Non-medicated- karma does not need any intermediate source like for the name and fame karma. A person receives recognition on fruition of auspicious karma. It is not about karma expressing at physical level but it is virtual expression. As we see a message sent from here reaches the other end of the country, though sound is a physical energy yet it is subtle. Mystifying is the fact that karma travelling in space manifest in a specific way. The prime Minister of India receives a lot of appreciation and love. Here he is receiving the good karmic results, implementing the secret theory beyond mind. Karma has its own design.

The karmic energy generates a virtual energy by probably sending some photons or electromagnetic vibrations. The karmic energy generates a cosmic plan or cosmic design in the virtual world. We now live in the technological world where virtual interactions are much more lively and feasible. One can manifest, replicate, talk, smell in the other part of the world, karma can generate energy to reach any corner and any time as well. Here the atomic model can help us apprehend better.

The Bohr model of electron, electromagnetic energy renders a special help to present karmic functionality. In a specific atom, the lowest energy level an electron can occupy is called the ground state. The higher orbitals represent higher excitation states. The higher the excitation state, the more energy the electron contains. When an electron absorbs energy, it jumps to a higher orbital. An electron in an excited state can release energy and 'fall' to a lower state. When it does, the electron releases a photon of electromagnetic energy. The energy contained in that photon corresponds to the difference between the two states the electron moves between. When the electron returns to the ground state, it can no longer release energy, but can absorb quanta of energy and move up to excitation states (higher orbitals).

The idea of excitation, release of energy and fall off to lower state could be used as an analogy to explain karma. The karma having gone through the dormant state is like the

atom in a ground state. Once the karma is ready to release its message through different sources, the message is released in the form of specific energy pattern. Once the message is sent, it is executed. Followed by this the karmic particles are shed off to be no longer hooked to the soul. This dormancy, excitement and fall are basic nature of karmic complex molecules but not the atomic particles as described by science.

Epistemic transfer

Epistemic transfer is used here to depict idea of the message being transferred to an x entity which could be a person, object or anything to execute it. The message need not be direct in terms of target or the message.

Here is an illustration, a kind of interaction termed "semiotic interaction" (Hoffmeyer 1995): a well-described case is exhibited by caterpillars munching upon the leaves of corn seedlings (Hoffman 1992; Krampen 1992). Here the munching process evokes an interpreter to be formed in the damaged leaf cells in the form of a (unknown) molecular message that is carried around all the leaves. Healthy leaves understand the message as an instruction to produce a certain volatile substance (a terpenoid) which is then emitted to the air. Wind will carry the terpenoid away and eventually it will be absorbed by certain wasps where it may then eventually provoke the formation of an interpreter in the form of muscular contractions destined to bring the wasp to the emitter of the volatile substance. When the wasp arrives here it senses the presence of the caterpillar and its body is induced to perform the chain of movements necessary for injecting its eggs into it. Upon hatching the wasp larvae eventually eat and kill the caterpillar.

Seen from above what happens is that the wasp and the corn seedling has a common, if opposite, interest in the caterpillar and that they have found a productive way to cooperate in this interest by entering a shared dimension of the semiosphere (Hoffmeyer 1996; Hoffmeyer forthcoming). Most interestingly however, wasps are not attracted by the terpenoid the first time they come upon it but have to learn how to interpret the substance. Or to state this differently, a regularity of nature, i.e., the corn seedling's emission of a certain terpenoid when attacked by caterpillars has become a sign leading the wasp to the caterpillar. Semiotic interactions depend on a capacity for associative learning, which is typical to living system at whatever scale [35].

In this example we find the chain reaction bringing about the result. The message encoded when decodes to produces a chemical which reaches a destination like the wasp in the example. In case of the leaf, we are familiar with the idea of smell as it is within our range of sensual touch which is used to send a new message. But in case

of Karma which sends a quantum message might not belong to our range of apprehension. Hence we see cases of ebola happenings abruptly show up from nowhere and we define it with mutation. The mutation of science can be a karmic consequence of Religion.

The karmic message is transferred in a language not deciphered by common man, yet it is received by a being, like the *nama* karma related to appreciation and non-appreciation. A simple example is -- A very good person when found guilty of some act, there is a major group who chooses to go by this negative energy and responds admonishing this person. But few take a step back and kind of neutrally analyze it without being too judgmental. We see here that most of us are influenced by the karmic generated energy wave around but some stay secluded and secure without any influence. This reflects that the ability to go by or against the karmic energy trend is crucial and dependent on the person and environment.

Conclusions

Karmas are cause and also important part of mundane existence of soul. *Bhava* karmas are impurities of soul and *dravya* karmas constituted by *karman varjanas* form a subtle body. Karmas bond to the soul due to activities, *yoga*, and passions, *kasayas*, and impose restrictions on the manifestation of natural powers of the soul. Psychological (*ghati*) karmas and biological (*aghati*) karmas have specified roles in the functioning of the soul body. The body system functions due to rise or fruition of biological karmas and subsidence-cum-annihilation of psychological karma.

The body system consists of karma body, fiery body and gross body and the soul in impure state. Interaction between the three bodies takes place through radiations called *adhyavasaya* and *lesya*. The relationship between the three bodies, conscious mind and soul is discussed and it is shown that the whole system works as a unit and to analyze working of any one of the component consideration of its relationship with other body components is essential. Explanation of working of any one component, say gross body, without taking into account the other components of the system is incomplete. The eight main types of karma have specific roles in the body system.

The role of biological karma and genes is compared and it is shown that genes themselves, without karma, cannot provide complete explanation of the processes taking place in the body. It is inferred that karmas control the genes. The overall performance of the organism is determined not only by internal factors like karma and genes but also by external factors, no-karma, prevailing in the environment.

The question of karmic expression is implicit in the belief system but yet lot unveiled. There are many scientific innovations which can assist explore the karmic functionality in similar terms like the epistasis and pleiotropy which had been accepted

idea but yet not received a special name for it in Jain terminology, and hence science helps apprehend better. The three postulates presented: secret theory, mediated and non-mediated theory and epistemic transfer are attempts to help explore the karmic expression and its interaction with the being and the world around. They need not be complete or all fulfilling theories but mere tools for better comprehension of complex karmic philosophy.

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Suggested Research Problems

- 1.** Study of relationship between various types of karma and biological functions of the body and psychological performance of humans. This shall need study of Jain literature in respect of role of karmas, human biology and psychology.
- 2.** Study of relationship between functions of bio photons and role of biological karmas.
- 3.** Study comparison of functioning of cell and DNA, role of epigenetic effects and role of karmas in the body.