CHAPTER IV

The Comparison of The Concept of Man and Universe in

The Pañca –Nikāya and Modern Science

IV.1 Buddhism and matters of Genetics and Productive Cloning

Buddhism has a certain number of doctrinal beliefs normally differing from those in the theistic tradition, making Buddhism respond to genetic research in a certain way. The way Buddhism responds to genetic research could be characterized as a kind of humanistic view. This kind of view is mainly based on human wisdom and rational investigation of the problem. The concept of personhood plays a significant role in modern bioethical debate as a number of the biomedical problems are concerned with the question of what should be counted as a person. Buddhism is viewed as a religion that rejects the existence of the self. This sometimes leads to the belief that there is no concept of personhood in Buddhist teaching. As understood by Buddhism, there are two meanings of personhood. One is the substantial meaning, and another is the non-substantial one. The Hindu theory of personhood can be cited as an example of the first meaning. For Hinduism, the self (atman) is the essence of human life. The definition of personhood in Hinduism is based on this self.
Buddhism states that human life is composed of the five aggregates – namely, materiality, feeling, perception, mental formation, and consciousness – and these aggregates are not substances. But the rejection of the self does not mean that there is no concept of personhood in Buddhist teaching. Personhood according to Buddhism is still possible even though there is no self in human life.

Buddhism defines personhood in terms of psychological facts. For example, somewhere in Buddhist texts the Buddha says that if someone tries to kill you and you feel that you dislike the action of that man, the same action done by you is also disliked by other people. Buddhism believes that all human beings share a set of psychological properties such as self-love, hatred of death, and desire for a good future. These psychological facts are something to be respected by other persons. Killing is wrong in Buddhist teaching because it violates self-love. Other moral tenets in Buddhism can be also understood in this light.

The concept of personhood in Buddhism can be better understood if it is related to the contents of morality taught by Buddhism. The Five Precepts constitute the basic moral code of Buddhism. They state that killing, stealing, sexual misconduct, lying and taking intoxicants is wrong. The first four precepts involve other persons, while the last one involves
oneself. In the first four precepts, two things are mentioned: the person's life and the person's belongings. Killing is concerned with a person's life, and we see from the above that killing is wrong because it violates the psychological reality of self-love. Stealing, sexual misconduct with another's beloved and lying are wrong because they violate a person's belongings. It should be noted that when we say that killing is wrong, Buddhism does not think that it is wrong because it violates the self of another person. The transcendental self is something beyond our observation, but psychological facts are totally observable. So using these facts as the grounds of personhood is more reliable. The last statement of the Five Precepts is involved with oneself. Taking intoxicants is wrong because it violates self-love. The person who takes intoxicants does not love himself, Buddhism argues.

It should be noted that the concept of personhood in Buddhist teaching is in some sense closely connected with the concept of human life as the composition of the five aggregates. The connection between these two concepts can be illustrated as follows. First of all, the five aggregates function as the foundation of personhood. The dead man cannot be a person because he possesses only the body, which is just one component of the whole five parts. The man in a comatose state is regarded by Buddhism as a person because he possesses all five aggregates, even though he is not
conscious. Buddhism believes that the five aggregates under some conditions may not function, but they exist. When we sleep and do not dream at all, it could be said that the mind and its components (mind and feeling, perception and mental formation) temporarily do not function. So killing a sleeping man is wrong because the man still has all five aggregates. This line of argument is applied to the case of person in a coma or in any deeply unconscious state. Euthanasia given to a person in such a state is viewed by Buddhism as no different from killing a conscious person.

Normally the theory of the soul claims that personhood occurs when the soul enters the body. In the Buddhist texts there are some passages indicating the same idea. The Buddha says that a person arises when three conditions appear: the mother and father have sexual intercourse, the mother possesses a good biological state, and the mind is present. This statement mentions two components of human life. The first is the biological (or material) process, and the second is the non-material one. What is called ‘mind’ in Buddhism means something containing properties of energy rather than substance, like the soul. So the Buddhist image of ‘mind’ could be likened to the image of electricity. The conscious principle seeking rebirth descends into the womb and finds ‘a halt’ in the ‘bodily matter’ (rupa),
thereby sparking a ‘new’ life.¹ According to Buddhism, mere biological fertilization is not enough to give rise to a new life. Modern Buddhist scholars seem to believe that when the egg and the sperm have united, if the mind does not enter as another condition the process of fertilization can never start. In the case of natural abortion, these scholars explain that it occurs because of the departure of the mind from the ongoing fertilization process.

The Buddha did not give an explicit statement about when personhood starts, but indirect sources seem to suggest that according to Buddhism personhood starts at the first moment of fertilization. It is recorded in the monastic rules that a monk once performed an abortion on a girl; the Buddha judged his action seriously wrong and that brought him a monastic crime of the highest sort. A monk committing this kind of wrongful deed must be expelled from the monastic community. The Buddha considered the embryo to be a person like an adult, so the monk who killed the embryo through abortion was judged by Buddhist monastic rules as having committed a crime equal in gravity to killing an adult. In the commentary on the rule stated above, it is stated clearly that killing a human being means destroying human life from the first moment of fertilization to

¹ The embryological passage can be found in Mahanidana sutta, Dighanikaya no.15,cp. T.W. and C.A.F. Rhys Davids, Dialogues of the Buddha, Part II, London 1951,60 (D.II.62).
human life outside the womb. So, even though the Buddha himself did not
give a clear-cut pronouncement about when personhood occurs, the
Buddhist tradition, especially the Theravada tradition, clearly states that
personhood starts when the process of fertilization takes place. The strict
position, prevalent in classic texts\(^2\) as well as in modern commentaries, is
expressed, for example, in Perea’s Buddhist interpretation of the “Universal
Declaration of Human Rights”: “It is the Buddhist view that the right to life
commences at the very first embryonic stage of a being, since maitri or love,
according to the Mettasutta\(^3\) should be extended even to the embryo or one
seeking birth- sambhavesi\(^4\)”.\(^5\)

In modern genetic research, sometimes questions concerning a
possible violation of personhood arise. The use of stem cells from the
embryo for medical purposes can be cited as an example. The major
objection to the use of embryonic stem cells is that such use is no different
from killing one person and using the body of that person to cure the body of
another person. Buddhism believes that things in nature have some essential
properties and these properties will determine the results of what we have

\(^2\) The classical description can be found e.g. Mahatanhasamkhaya sutta, Majjhimanikaya, no.38 (M.I. 265f),
cp.Haldar 1977, 27. I will refrain here from interpreting the Buddhist classical sources on the beginning of
human life which will be done elsewhere.

\(^3\) Sn. V. 143-152

\(^4\) Sn. V. 147

\(^5\) This passage, nevertheless, is ambiguous, as Buddhaghosa declares in his commentary: Either embryo
pushing to get into existence, or un-released humans, ‘worldly’ humans, who will be reborn could be
depicted here.
done. Actions performed by human beings are one kind of natural phenomena. Human actions in themselves contain certain moral properties. Killing regardless of conditions is a violation of personhood, so killing is a bad thing in itself to some extent.

The Buddha says that what he teaches are natural phenomena. The dhamma, which refers to the teaching of the Buddha, is understood by Buddhists as natural things and natural laws. For non-Buddhists, the best way to understand Buddhist teaching is to view it as they view natural sciences such as physics, chemistry, and biology. Buddhism teaches that the universe is naturally given, and the Buddha himself clearly declares that he is not interested in exploring the origin and the end of the universe. What he wishes to explore is the universe as it appears. Some scientists who support human cloning state that human cloning should not be viewed as unnatural because there is a kind of human cloning permitted by nature: the case of identical twins. According to these scientists, human cloning performed by scientists can be viewed as the making of identical twins. What is different is merely that natural identical twins are of the same age, while artificial identical twins are of different ages. Looked at from this point, human cloning is not immoral because it is natural in the sense that it follows the law of nature as found in the case of natural identical twins.
In Buddhism, morality can be separated from the concept of being natural because according to Buddhist teaching it seems impossible to say that such and such a phenomenon is unnatural. Buddhism proposes that the moral goodness or badness attributable to any action depends solely on the moral properties. Actually, Buddhism does not think that there is anything unnatural. Buddhism believes in the Five Laws of Nature: namely, the physical law (utuniyama), the biological law (bijaniyama), the law of action (kammaniyama), the law of mind (cittaniyama), and the law of dhamma (dhammaniyama) and thinks that there is nothing which is beyond these laws of nature. Buddhism considers man and nature to be a single system. That is, Buddhism accepts that nature has its own long history and that man in his present form has a much shorter history compared with nature. However, there is some potentiality in man which cannot be found in nature: namely, the potentiality of consciousness and intelligence (or wisdom, if that is the more preferred term). Through consciousness, man learns to solve certain problems which may take a very long time to solve by natural processes, or which may be impossible for nature to solve by itself. When we break our arm, surgery is done to heal the broken arm. This surgery is done by man, but it does not join the broken arm. Nature instead plays the role behind the process of joining the broken bone. So, it can be said that in the joining of
the broken arm two things are equally needed – man and nature. Following this line of thought, Buddhism does not posit a separation between man and nature. The notion that we can trust only natural phenomena is viewed by Buddhism as extreme. Buddhism likewise views as extreme the idea that man can dominate nature or do anything unconditionally.

In Buddhist terms, “nature” refers to the patterns of causes and conditions that reflect the karma of sentient beings. In terms of respect for life, which is the foundation of all Buddhist practice, nature can also be understood as the sum total of ecosystems that support life; it is the essential condition for preserving living beings from harm. Humans, animals, and other sentient beings are dependent upon a wholesome environment for a healthy life. Harming that environment causes those sentient beings to suffer, and, ultimately, to die prematurely. Harming life energy itself, even on the level of microorganisms, can have deleterious effects on more complex organisms because of the interconnectedness of all life.

Harm in Buddhist teaching can be divided into two main categories: harm to oneself, and harm to others. Harm to oneself means the action is intentionally performed by a person and that the action harms him in one of two ways. It harms him in terms of physicality, or it harms him in terms of
dignity. Taking intoxicants is prohibited by the Fifth Precept in Buddhism on the grounds that taking such substances does physical harm to oneself. Selling body organs such as kidneys could be viewed as harm in terms of dignity. The person who does such a thing, for whatever reason, could be viewed as not respecting his own status as a human being. He treats his life as if it were a nonhuman product that can be sold. This interpretation makes it possible to state that the sale of human organs constitutes a harm with regard to one's dignity. The second kind of harm, harm to others, can be of two meanings as well. Normally, in a free society, some personally harmful actions may be tolerated by the laws of that society. Drinking beer, for example, is harmful to one's own person; but this kind of action is tolerated by the law in Buddhist countries because it is accepted that only serious harmful actions should not be tolerated by the law. Using drugs is prohibited by law in Buddhist countries because it is believed that the harm resulting from drug use is much more serious than that which results from drinking beer. So, it can be said that according to Buddhist morality personal freedom does not cover personally serious harmful actions, in terms either of physical damage or of damage to one's human dignity. Harm to others is more obviously seen as wrong by nature, whether it relates to physical damage or to damage to human dignity. However, as the intention behind an action
plays a significant role in the Buddhist system of moral judgment, investigating harm to others cannot be separated from consideration of the intention of the doer.

Applying the harm principle to the issue of human cloning, it seems that the first question is: can human cloning be interpreted in terms of harm? It is clear that the cloning of human beings in some cases could be questioned whether or not it is personal issue. For example, a man clones himself to use the embryonic stem cells. In such a case, can we say that it is really a personal matter, implying that the harm principle to be used for this case is the harm to oneself only? According to Buddhism, a clone is a person from the first moment of fertilization, so it is very difficult, if not impossible to locate human cloning within the area of personal activity. It seems obvious that the harm in the case of human cloning is the harm to others. However, this does not mean that any case of human cloning is viewed by Buddhism as harm to others. Buddhism merely says that any harm caused by human cloning must be regarded as harm to others. Simply speaking, Buddhism does not accept that human cloning can be understood in terms of personal activity. Therapeutic human cloning and the use of embryonic stem cells could be considered in terms of harm to the life of the embryo. Can we accept such harm for the benefit of us or not? Yet, Hwang’s definition of
‘therapeutic cloning’ is quite unusual. It has commonly been defined as the direct opposite to ‘reproductive cloning’ – the latter characterized as the attempt to create a new being, or, more generally, a new independent from of life. Astonishingly, in his quotation above Hwang seems to take the position that ‘therapeutic cloning’ should not be condemned because it is just another ‘appearance’ of a life cycle, i.e., a new phase of a cyclic life series. Can this statement, which equates ‘therapeutic cloning’ with the beginning of a new life form, be reconciled with Buddhist thought? And it is consistent with the current use of the two terms ‘therapeutic’ and ‘reproductive’ cloning? Apart from the critique of the concept ‘therapeutic cloning’- it should be more adequately termed ‘cloning for biomedical research’. Not surprising, therefore, Hwang himself also admits that his experiments cannot be separated from the initial procedure of cloning human beings. “yes, this technique cannot be separated from reproductive cloning,” Hwang said in an interview, and he added, that every country should prevent any reproductive cloning experimentation with this technology. The case of so-called ‘therapeutic cloning’ differs significantly from cloning-to-produce-children as regards the criterion of intention; the

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6 Traditionally, the continuity of the life-death-life…cycle is conditioned by karma, and, first and foremost, a sorrowful experience of endless circulation (samsara) - so starting a new life may not necessarily be a positive act.

7 Interview-transcript of the Australian Broadcasting Corporation (ABC). Michael Vincent (reporting), Friday 13, 2004, see http://www.abc.net.au/am/content/2004/s1044228.tm
first steps of all cloning procedures are, indeed, the same. Because in ‘cloning-for-research’ there is no direct advantage in bringing to life a new being, but rather it involves taking life with rather an uncertain effect on others, some Buddhists tend towards a strict application of first precept, that is, to abstain from killing altogether.\footnote{\textquotedblleft Whatever monk should intentionally, with his own hand, deprive a human or one that has human form of life, supply him a knife, search for an assassin for him, instigate him to death, or praise the nature of death…, this monk is parajika, expelled\textquotedblright{} (Prebish, 1996, 51f). This precept to abstain from killing is part of the “Pratimoksha”, the central ‘rule’ of what should be morally binding. It is one of the initial four; if a violation is confessed, immediate expulsion from the Buddhist monastic community should take place. But lay Buddhists must also abstain from killing.}

Taking one's life for the benefit of another is not necessarily evil in Buddhist perspective. We have the soldier acting as the guardian of the country. The death of a soldier for his country suggests that in some cases the sacrifice of one's life for the benefit of one's country or the majority of people in one's country may be necessary. In Buddhist literature, a life donation is sometimes found. Bodhisattva sometimes donates his life for the benefit of another and such doing is deemed good. At least, Buddhist doctrine permits the taking of life under certain circumstances. However, donation is a concept in personal ethics. Donation must come from consent and wisdom. We do not know whether embryo is willing or not. This is the most difficult problem to overcome. Maybe the idea of enforced donation could be a way out of this difficulty. Enforced donation is self-contradictory
in Buddhist personal ethics, but it could be possible in the social ethics of Buddhism.

Buddhist ethics is analytical ethics. It may be found that in some cases the cloning of human beings or other kinds of human genetic research does not harm anyone. The problem is: when we talk about the concept of harm from the Buddhist perspective, does such harm involve only the person, or can it be extended to society? This question is important because some arguments against cloning and other human genetic research suggest that though we possibly cannot find any obvious victim of harm in terms of individuals, it can be said that society is harmed by allowing such activities. Even though drinking intoxicants can be viewed as personal freedom, we should remark that if most members of society are those who persistently exercise such a habit, our society must be weak. In this case, intoxicants cannot be viewed in terms of freedom only. It can be related to the moral structure of society as well. Human cloning and other human genetic research considered in this light could be viewed as harmful to society, even in a case where we think that everyone involved is happy and no one is harmed at all. Buddhism agrees that human society is not just a place where people gather and do only what benefit themselves; on the contrary, society has a spirit, and this is nothing but the common ideal to meet certain moral
standards. We are not just living, but we are living a good life as noble humans. Social necessity is a notion Buddhist ethics tolerates in some cases. Buddhism teaches that killing is an evil; but Buddhism never teaches against having an army. Reasonable capital punishment is sometimes interpreted by Buddhist thinkers as a social necessity, implying that it should be tolerated or deemed legal in a Buddhist community. If in some cases we can rationally prove that cloning or other human genetic research is a social necessity. Analysis of the context and surrounding data will help us to classify the various categories of human cloning, and other human genetic research, of which some categories may meet the conditions tolerated by Buddhist ethics. At this point, we will find that human cloning and related genetic research are an open-ended subject in the Buddhist community, meaning that some doors are open for the further exploration of these activities in Buddhist society.

In the Buddhist community, the ethics of Buddhism is considered in two dimensions: individual and social. The ethics taught by the Buddha is in the first place intended for personal use. Buddhist ethics in this respect considers human lives as individual units; each of them facing some common problems, and every individual bears responsibility for solving these problems by him- or herself. So, what is good and what is bad within
this dimension of Buddhist ethics are personal matters in the sense that if something is considered good, its goodness is explained with reference solely to its effect on the individual. When people request the Five Precepts, the request form states that these precepts are to be adopted by each person individually. So, it is understood among Buddhists that goodness or badness in one's life is a personal matter. Each person must monitor his or her own life. It is clear that Buddhist personal ethics is based on the law of kamma taught by the Buddha. To judge whether the response to a given moral question is wrong or not according to personal ethics is not difficult. Human cloning according to personal ethics is not immoral insofar as it is undertaken for reproductive purposes. Buddhism adheres to a moral principle that what conduces to the harm and suffering of oneself and others is unwholesome. By the same token, that which conduces to the benefit and happiness of oneself and others is wholesome. Destroying life or prohibiting birth can be considered as harmful, while prolonging life or giving birth is beneficial. Reproductive cloning could be judged as not immoral in this sense. By contrast, stem cell research could be interpreted as harmful, since the embryo is destroyed. This is not to suggest that according to Buddhist personal ethics reproductive human cloning is totally right and stem cell
research totally wrong. It just means that we can interpret the issues in both
directions.

According to Buddhist social ethics, on the other hand, stem cell
research could be viewed differently from what we have seen in the
Buddhist personal ethics. In reliable reproductive cloning no one is harmed,
so it is not against either the personal or the social morality of Buddhism. It
is only therapeutic cloning, the cloning for medical use in which the clone
(including the clone generated solely from a woman's egg) is destroyed, that
could be problematic. Modern ethical dilemmas are usually concerned with
the conflict of interest between two persons or two groups of persons. In the
issue of abortion, the two parties involved are a mother and a child. The
mother's interest is protected if an abortion is permitted, while the child's
interest is protected if an abortion is prohibited. Likewise, in therapeutic
human cloning and embryonic stem cell research, there are two persons or
two groups of persons involved. In terms of rights, the patient's right to
health is protected if therapeutic cloning and stem cell research are allowed.
But in carrying out such practices, the clone's or embryo's right to life is
violated. The hard task to be undertaken by any ethical school or ethical
theory, including Buddhist ethics, is to decide, between the two sides in the
conflict of right or interest, whose right or interest should be protected and
on what grounds. At this point, we find that the ethics at the heart of the
issue is social ethics, and socially ethical dilemmas are more difficult to
solve compared with personally ethical dilemmas because in personal ethics
only a single person is involved. It is much easier to find a solution to a
collision affecting solely one's own life. When a man is deciding whether or
not he should clone himself to have a clone for purposes of medical healing,
the principles of wholesome and unwholesome deeds given by Buddhism
seem sufficient to provide him with a solution. Religious ethics normally
endorses the altruistic way in moral decisions. So, the devout Buddhists are
those who prefer not to clone themselves, for the reason that death is not
dreadful compared with the sin committed in cloning an embryo for medical
use. But when society tries to judge the claim of some of its members that
they have the ultimate right over their own bodies, and thus the right to clone
themselves for medical use, finding a solution is not easy. Whose rights
should be protected between the patient and the clone? Between the benefit
of the greater number of people and the violation of the embryo's rights,
which should be chosen? How Buddhist social ethics deals with such a
dilemma is not easy to answer even for those who are well-versed in
Buddhist doctrines.
IV.2. Dependent Origination and Theory of Relativity

The Buddhist concept of dependent origination is a vision in which sentient beings are fully integrated in the co-arising of all things. The most important effort is to free ourselves from delusions and attachments and widen our circle of compassion to embrace all living creatures and the nature. The modern scientists believe that there are a number of philosophical concepts of modern science embedded in Buddhism which needs careful exploration. The time has come to examine the original Buddhist doctrines carefully and sort out the sparkling components of modern science concealed in them. The renowned scientist Albert Einstein also upheld the concepts of Buddhism and expressed his own views in the light of modern science.

Modern physics bears the impact of Albert Einstein more than that of any other physicist. His contributions to atomic physics and study of the photoelectric effect had earned him the Noble Prize. His theory of relativity with its profound modifications of the notions of space, time and gravitation had fundamentally changed and deepened our understanding of the physical and philosophical conception of the universe. Apart from his scientific ingenuity, Einstein’s courageous struggle for human rights, social justice and international peace had secured him a unique place in modern history of the
world. He had also epitomized his philosophy of religion by stating that “science without religion is lame and religion without science is blind”. According to Einstein, religions are not only compatible with science, but also they are promoted by science. The fundamental tenet of his concept of “cosmic religion” is that science enhances religion. Religion is nurtured by the feeling of wonder and astonishment that accompany the discovery of the laws of nature and awareness of harmony that rules the universe.⁹

In this context, it is important to remember that though Buddhism did not have any rigorous methodology for studying the physical world, but the Buddhist scholars and contemplatives had developed views on matters related to the universe and its contents. This was based on pure logical and rational thinking and no experimental model was applied to prove or disprove any of these observations. These phenomena were discussed in detail in the early Buddhism, the *Abhidhamma Pitaka*, the *Visuddhimagga*, the Pali commentaries, *Mahāvibhāṣā-śāstra*, the *Kālacakra Tantra* and in the literature on Buddhist epistemology.¹⁰

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Buddhist Doctrine of Dependent Origination

The progression of causes and conditions is the reality which applies to all things, from the natural environment, which is an external, physical condition, to the events of human society, ethical principles, life events and the happiness and suffering which manifest in our own minds. These systems of causal relationship are part of the one natural truth. Our happiness within this natural system depends on having some knowledge of how it works and practicing correctly within it, through addressing problems on the personal, social, and environmental levels. Given that all things are interconnected, and all are affecting each other, success in dealing with the world lies in creating harmony within it.

The sciences which have evolved with human civilization, and which are influencing our lives so profoundly today, are said to be based on reason and rationality. Their storehouse of knowledge has been amassed through interacting with these natural laws of conditionality. But the human search for knowledge in modern scientific fields has three notable features: Firstly, the search for knowledge in these sciences, and the application of that knowledge, is separated into distinct categories. Each branch of science is distinct from the others. Secondly, human beings in this present civilization are of the belief that the law of conditionality applies only to the
physical world, not to the mental world, or to abstract values such as ethics. This can be seen even in the study of psychology, which tends to look at the cause and effect process only in relation to physical phenomena. Thirdly, the application of scientific knowledge (of the laws of conditionality) is applied solely to serve self interests. Our relationship with the natural environment, for instance, is centered around trying to derive as much resources from it as we can with little or no regard for the consequences.

Underneath it all, we tend to interpret such concepts as happiness, freedom, rights, liberty, and peace in ways that preserve self interests and encroach on others. Even when controlling other people comes to be seen as a blameworthy act, this aggressive tendency is then turned in other directions, such as the natural environment. Now that we are beginning to realize that it is impossible to really control other people or other things, the only meaning left in life is to preserve self interests and protect territorial rights. Living as we do with this faulty knowledge and these mistaken beliefs, the natural environment is thrown out of skew, society is in turmoil, and human life, both physically and mentally, is disoriented. The world seems to be full of conflict and suffering.

All facets of the natural order -- the physical world and the human world, the world of conditions (dhamma) and the world of actions (kamma),
the material world and the mental world -- are connected and interrelated, they cannot be separated. Disorder and aberration in one sector will affect other sectors. If we want to live in peace, we must learn how to live in harmony with all spheres of the natural environment, both the internal and the external, the individual and the social, the physical and the mental, the material and the immaterial.

To create true happiness it is of utmost importance that we not only reflect on the interrelationship of all things in the natural order, but also see ourselves clearly as one system of causal relationships within that natural order, becoming aware first of the internal mental factors, then those in our life experiences, in society, and ultimately in the world around us. This is why, all the systems of causal relationship based on the law "because there is this, that arises; when this ceases that ceases," the teachings of Buddhism begin with, and stress throughout, the factors involved in the creation of suffering in individual awareness -- "because there is ignorance, there are volitional formations." Once this system of causal relationship is understood on the inner level, we are then in a position to see the connections between these inner factors and the causal relationships in society and the natural environment.

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11 S. Vol. II.p.28.
The doctrine of dependent origination is the key insight of the entire teachings of the Buddha, which is also equated with the Dhamma. Buddhism had regarded it as, ‘One who sees dependent origination sees the Dhamma; one who sees the Dhamma sees dependent origination’\textsuperscript{12}. Dependent origination means that all phenomena arise as the result of conditions and cease when those conditions change. The general theory of dependent origination, taught by the Buddha, is as follows: “When this exists, that comes to be; with the arising of this, that arises. When this does not exist, that does not come to be; with the cessation of this, that ceases.”\textsuperscript{13} So nothing exists as a static, isolated entity.\textsuperscript{14}

Everything arises and ceases depending on causes and conditions which themselves arise due to causes and conditions. There is no ultimate ground or primordial cause, but a network of causes and conditions. This discards the view of the presence of a metaphysical selfhood, permanent and fixed entity like “Creator God” or a substance underlying the constant change, which is life. It is the delusion or ignorance of dependent origination which keeps people confused and attach to views and actions which result in suffering. Dependent origination is the true nature of reality regardless of

\textsuperscript{12} M. Vol. I PP,236-237I. M. I. 191
\textsuperscript{13} Ibid
whether there is anyone who realizes it or not. Just as the law of gravity is true irrespective of anyone’s opinions about it and it was present even before it was scientifically proved by Isaac Newton. Similarly, the dependent origination is the way things are and the Buddha had simply realized it and confirmed it to others.15

**Einstein’s Theories on Relativity**

Historians call the year 1905 as the “annus mirabilis” or “miracle year”, because in that year the renowned scientist Albert Einstein published four remarkable scientific papers addressing fundamental problems about the nature of energy, matter, motion, time and space. He was awarded the noble prize in the year 1921 for his outstanding contributions to the Theoretical Physics and especially for his discovery of the “Law of the Photoelectric Effect”. Some of his theories which could be viewed in the light of Buddhist doctrine of Dependent origination are as follows:

- In June 1905, Einstein proposed his concept of special relativity. Einstein's March paper treated light as particles, but special relativity estimated light as a continuous field of waves. So, Einstein observed light both as wave and particle.

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• Later in 1905 came an extension of special relativity in which Einstein proved that energy and matter are linked in the most famous relationship in physics: $E=mc^2$. (The energy content of a body is equal to the mass of the body times the speed of light in vacuum squared). This equation predicted an evolution of energy roughly a million times more efficient than that obtained by ordinary physiochemical means. This led to the theory of the conservation of energy, in the form of the first law of thermodynamics, which stated that the total amount of energy in any isolated system always remains constant. Although it can only be changed from one form to another, this energy cannot be created or destroyed.

• During 1915, Einstein completed the General Theory of Relativity and showed that matter and energy actually mold the shape of space and the flow of time. What we feel as the 'force' of gravity is simply the sensation of following the shortest path we can through curved, four-dimensional space-time. It was a radical vision where space was no longer considered to be the box to enclose the universe. Instead, space and time along with matter and energy are all locked together in the most intimate embrace.
Similarities between the Buddhist Doctrine of Dependent Origination and Views of Einstein

The Buddhist concept of dependent origination is a vision in which sentient beings are not determined by forces beyond their control. They are rather fully integrated in the co-arising of all things. Human beings are able to take responsibilities and create better conditions for themselves and others by becoming aware of the way things arise in mutual dependence.

The most important effort is to free ourselves from delusions and attachments and widen our circle of compassion to embrace all living creatures and the nature. The renowned scientist Albert Einstein also upheld these concepts of Buddhism and expressed his own views in the light of modern science. Some of the philosophical concepts which are common to both Buddhism and Einstein are discussed here in details.

The concept that universe was created by a “Creator God”, had haunted the minds of human beings since many generations. The Buddha had transcended the theory of a “Creator God” with the help of his explanations on the concept of impermanence in his Doctrine of Dependent Origination. Like the Buddha, when we review this concept of a “Creator God” in the light of modern science, some of the obvious questions that arise in our minds are - Who is this creator god, who had created this “Creator
God” and how did he come into existence? Albert Einstein had also never accepted the principle of a “Creator God”. He had clearly expressed his views as, “I cannot conceive of a God who rewards and punishes his creatures, or has a will of the kind that we experience in ourselves. Neither can I nor would I want to conceive of an individual that survives his physical death; let feeble souls, from fear or absurd egoism, cherish such thoughts”.16

Buddhism considered events as space-time representations of a continuous dynamic flux. Nothing is considered to be static and permanent, but everything is in a state of constant change in our universe of experience. However, there is no single enduring changing entity, but there exist a series of momentary changes. The Buddha was often regarded as “Tathagata” which means “one who comes and goes thus”. The Buddha gave this famous doctrine of momentariness (ksanikavada) in terms of “here and now”.17 The Quantum field theory also considers physical phenomena as transient manifestations of an underlying fundamental unity. Following this concept of dynamic flux, Einstein had also demonstrated the spontaneous and random movements of atoms, called Brownian motion.18 Einstein’s

relativistic equation $E=mc^2$ implies that mass can be transformed into other forms of energy. In high energy collision of elementary particles. Their masses can be destroyed and the energy contained in their masses can be transformed into kinetic energy and distributed among the other particles. Conversely when elementary particles are made to collide with very high velocities their kinetic energies can be transformed to form masses of new particles. This enables the physicist to measure the masses of particles in corresponding energy units. It appears that the existence of matter and its interaction cannot be separated and the quantum picture is one of ceaseless interactions. The dynamic flux is not restricted to the micro-world alone. The astro-world appears to be in the same state of flux if one considers any cosmological model.

Time became important in relation to the thermodynamics and Einstein’s theory of relativity. Observing the irreversibility or asymmetry between the past and future, it has been argued that time is uni-directional and is also associated with the experience of “psychological time”. Einstein himself had felt the uni-directionality of time and considered the concept of time to be an illusion. In Einstein’s theory of relativity, time (with space) becomes relative and contingent both on speed and gravity. The faster one
travels or the closer one is to an object with a very strong gravitational pull, time elapses more slowly.\textsuperscript{19}

Buddhism recognize that time can be experienced as moving faster or slower in certain situations. What others might experience as only an instant, could be experienced by a person meditating as a much longer period of time. From the Buddhist perspective, when one actually analyzes time; it is found to not really exist. Thus, time is a “conventional truth” (paññatti) and a verbal or conceptual designation which is imputed onto experiences of a past, present, and future. It is called “conventional” because it is only established nominally on the basis of words and thoughts. If we actually try to point to an instant of time, the moment that we try to pinpoint has already passed and a future moment has now become the “present.” In this way, we cannot technically speak of any fixed, locatable present as it always vanishes upon close examination. The present only exists in dependence upon the concepts of past and future. So, we observe that the Buddhist concept of “psychological time” is similar to Einstein’s perception that time is illusory.

Time is also considered an \textit{imputed entity} in a yet more scholastic and technical context. This is because it is identified on the basis of

\textsuperscript{19} Einstein, A., 1931. The world as I see it. \textit{Forum and Century: Living Philosophies} 84: 193-4.
something that is other than itself. We cannot point at the “time” in reality, but rather perceived it through designations on things that are not time, like the clock which is a substantial entity. Therefore, time fits in a third class of phenomenon technically referred to as “non-associated composite phenomena.” Here, the term “non-associated” means that it is neither physical nor mental and “composite” means that time is dependent on other factors and is impermanent.

Apart from these concepts of time, the Buddhist schools had also identified the shortest possible divisions of time that is required to perform an act and the shortest division of time in general. An example of the shortest possible divisions of time is the time it takes to blink our eye, which is called a moment. The shortest division of time is considered to be 1/60th (or even 1/365th, depending on the source) the duration of a finger snap, a number which one Buddhist scholar has calculated roughly as one millisecond.

Another major area of discussion for Buddhists, physicists, and cosmologists is the nature of empty space and cosmogony. The concept of Time and Space in relation to Buddhism are the two varieties of paññatti. They are two conceptual constructs without any corresponding objective reality. In Milindapañha, the only two things which are considered to be
independent of kamma or of causes or of season are namely Nibbāna and space. But it carefully avoids the use of the term “unconditioned” (asaṅkhata) and relates space as neither conditioned nor unconditioned. The Theravādins include the space element concept in the objective field of mental objects (dhammāyatana) which means that it is not visible but can be cognized only as an object of mind-consciousness.\textsuperscript{20}

In the Sarvāstivāda Abhidhamma, the counterpart of space element is referred to as ākāśa-dhātu. The space element is either light (āloka) or darkness (tamas) and therefore it is included in the objective sense-field of the visible (rupāyatana). Besides this, the Sarvāstivādins recognize another kind of space which is called ākāśa and not ākāśa dhātu. It is defined not as space bound by matter, but as that which provides room for the movement of matter (yatra rūpasya gati). It does not obstruct matter, which freely exists therein. It is also not obstructed by matter, for it cannot be dislodged by matter. Thus, what the Sarvāstivādins call unconditioned space is the space considered absolutely real and as serving as a receptacle for the existence and movement of material phenomena.\textsuperscript{21}

\textsuperscript{20} Karunadasa, Y. 2009. \textit{Time and Space}. Hong Kong: The Centre of Buddhist Studies. The University of Hong Kong.

In the Madhyamaka system Nagarjuna had explained the Buddhist Doctrine of Dependent Origination in the light of “Sunyata” which means “void or emptiness”. The space in universe is also intimately connected to this Buddhist concept of śūnyatā or emptiness. Just as nothing can exist without space, so too can nothing exist without emptiness. Because all phenomena are empty of a static, independent and permanent existence, they can come into existence, change their forms and pass on. We should realize the “absolute truth” behind the concept of “emptiness” as absence of self-entity and attachment and accept the fact that interdependence is the nature of reality.

In physics, there are highly developed mathematical theories which suggest the empty space of a vacuum actually contains an infinite amount of energy. It is speculated that this energy has a role in the evolution in the universe. While this is still an area of controversy and mystery within theoretical physics, it makes for a rough parallel to the Buddhist concept of empty-particles and the universe arising out of space. However, the whole process of cosmo-genesis according to Buddhism is catalyzed by the actions of living beings or Kamma.

In Buddhist literature, the cosmos are explained to be oscillating or continuously forming, enduring for a time, and then undergoing a final
period of destruction. In the metaphysical realm; Buddhism strongly maintains an emphasis on reasoning based on the principles of impermanence and causality. Though the perception of co-existence of multiple solar systems was present during early Buddhism, but it became more popular with the development of the Mahayana tradition of Buddhism. In Mahayana tradition, it is believed that there are hundred thousand galaxies in the entire universe and each galaxy is holding at least one Buddha at a given point of time. If we separate out the deification part of the Buddha concept here, we can find that there was a notion of multiple galaxies in ancient India and the possible reason of their creation was well-explained by the Buddhist Doctrine of Dependent Origination.22

Einstein's general relativity theory predicts that strong gravitational fields will bend the path of nearby light rays. A very large mass like that of an entire galaxy with an enormous gravitational field can bend light rays from Quasars which are the most distant illuminated objects in the universe. Thus, it can act as a gravitational lens. Other scientists had also confirmed this “Beaming Effect” of “Gravitational Lens” by observing the increase in red-shift in visual spectrum of light in the presence of a number of galaxies directly hit by a distant beam from Quasars. However, the presence of more

than one solar system in the universe is now confirmed by mapping the orbital path of the planet Pluto, the last planet in our solar system. It is found that this planet revolves around the sun of some other unknown solar system. The relativity showed that in spite of the different frames of reference to which the observer belongs and consequently its corresponding observational results one can study these relations one can agree on what one calls the laws of nature. Certain ‘physical quantities’ which appear same to both the observers moving relative to each other with uniform velocity are the invariants. The mathematical relationship on which both observers agree are the laws of nature. It seems appropriate to call these relationships the laws which are valid from different view points. Taking into consideration all experimental date known up to the present time. Hence we see that the principle programe of special relativity was to formulate the laws of nature independently of any special co-ordinate system. All inertial frames should be subject to the same laws of physics uniformly.

The Buddha on the other hand formulated his law of karma which executed itself on all living creatures irrespective of their individual conditions. No special consideration or privilege was to be meted out to anyone. To a great extent Indian philosophy was obsessed by the notion of

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the ‘absolute’. It could be considered the correlate of the concept of substance in early western philosophy. I think that Buddhists did a great deal to modify this concept. The buddhist denies the existence of all ‘Absolutes’, but he does not deny the existence of the external or internal world. For him the world is an aggregate of conditions or relation which are themselves not self-existent but interdependent. Lord Buddha himself said to Anathapindika, “If by the Absolute is meant something out of relations to all known things, its existence cannot be established by any reasoning”. Of course this is a controversial point and many scholars accuse Nagarjuna of putting forth the concept of absolute in the guise of ‘Sunyata’. On the other hand Einstein showed that absolute space and absolute time have been shown to be myths. We must replace these old ideas by more observational concepts. The state of the observer profoundly influences this observed antity and, therefore, various observers get widely different results in their measurements of length, mass and time.

Albert Einstein was very much influenced by the Buddhist doctrines related to the concepts of absence of any Creator God, absence of any soul or self (anatta), Dependent Origination (paticcasamuppada), impermanence (anicca) and the emphasis on practicing compassion with moral-driven, volitional activities (kamma). He had also mentioned that he never believed
in the existence of a personal God. If something is in him that could be regarded as “religious”, was the unbounded admiration for the structure of the world so far as science could reveal it.

According to his opinion, the religion of the future will be a “cosmic religion”. It should transcend personal God and avoid dogma and theology. Covering both the natural and the spiritual, it should be based on a religious sense arising from the experience of all things natural and spiritual as a meaningful unity. Buddhism answers this description. Buddhism has the characteristics of what would be expected in a cosmic religion for the future: It transcends a personal God, avoids dogmas and theology; it covers both the natural and spiritual; and it is based on a religious sense aspiring from the experience of all things, natural and spiritual, as a meaningful unity. So, “if there is any religion that would cope with modern scientific needs it would be Buddhism”.24

We have taken an overview of a fraction on what Buddhists and scientists had discussed about the contents and processes of the physical world. We had not included, in our discussion, the Indian and Buddhist science of astronomy, which was an area where the ancient Indians had a high degree of expertise. We should keep in mind that modern science did

not emerge all of a sudden from nowhere. The process of evolution of modern science was slow and the basic elementary philosophical and logical concepts were already present in our religious practices. The modern scientists believe that there are a number of philosophical concepts of modern science embedded in Buddhism which needs careful exploration.

Now, in an era of revolutionary scientific progress, the time has come for us to keep aside the entire glorification and deification part of Buddhism and examine the original doctrines carefully to sort out the sparkling components of modern science hidden in them. If we achieve this successfully, we could relate the Buddha as “social scientist”, who had worked for the benefit of mankind. This effort would also induce fresh impetus to our innovative way of understanding the conventional ideas and transform our religious concepts into a more dynamic and realistic structure in order to make them more acceptable to the new generation.

**IV.3. No-self Theory and Quantum Theory**

It is now increasingly becoming clear to those who reach the most important position of modern science that what science has been discovering a new had been known to the Buddha over 2,500 years ago. Thus, the teachings of the Buddha, founded on the basis of the true reality of nature, have been recognized to be valid at all times and under all conditions. It is
clear that Buddhism is getting accepted, the world over, as the way of life of intelligent people in the third millennium. In this chapters, The concept of man and universe compared between No-self, emptiness, interdependence in the the Pañca-Nikāya and Modern scientific theory such as Quantum.

Quantum means 'discrete amount' or 'portion'. Max Planck discovered in 1900 that you could not find less than a certain minimum amount of anything. This minimum amount is now called the Planck unit. Quantum Physics is the science of things so small that the quantum nature of reality has an effect.

In Buddhist tradition, the Theory of No-self states that all things or occurrences are dependent upon one another. Nothing in the universe is an independent entity. Quantum mechanics, on the other hand, challenges some of the original theories of physics. The most controversial finding of the quantum physics era is that light is both a particle and a wave. Both Buddhism and quantum mechanics illustrate that the universe is not what he or she perceives it to be with their five senses, and that everything is connected in some way. The comparison between Buddhist thought and quantum mechanics is especially convincing because it has the power to motivate those driven by faith and fact. The Theory of No-self appeals to those who are driven by spirituality, while science provides an experimental
basis for proving reality is not always as it appears to be. Both schools of thought, however, recognize the utter importance of putting everything in perspective.

Quantum theory requires a participatory universe, which means that somehow phenomena which appear to be external and independent of the minds of sentient beings cannot be so. In the beginning there were only probabilities. The universe could only come into existence if someone observed it. … The universe exists because we are aware of it.  

Quantum physics clearly shows that we are involved, or are participators, in the existence of the universe. Indeed Wheeler also wrote that:

…no phenomenon is a phenomenon until it is an observed phenomenon.  

And he did not mean by this that some already existing entity is not experienced as a phenomenon until observed, he meant that the observation has a creative role in the existence of the apparent entity revealed by the phenomenon. None has its proper existence, but only an existence in relation to another object acting as a reference point. They are couple properties

25 Rosenblum, Bruce and Kuttner, Fred (2006) p

which cannot be attributed to either of the members of the couple taken separately.

In other words the actual ‘physical’ properties of any apparently independent ‘material’ object are not purely determined by the nature of the object itself but also depend upon its relationship and interconnection with other objects. However, there is another, perhaps more fundamental, aspect to the Buddhist insight into the emptiness of phenomena which is that all phenomena are inextricably and intimately connected to, and even created by, the minds of observers.

All appearances, from indivisible particles to vast forms, are mind.\(^{27}\)

Common sense, of course, would indicate that such a notion, that what \textit{appears} to be an independent ‘material’ reality is actually of the nature of mind or consciousness, must be misguided, and in the ‘classical’, or pre-quantum, era of Western science such a notion would have appeared outlandish. However, with the advent of the quantum revolution the notion that the ultimate nature of the physical world is mind-substance, or Mindnature, has become increasingly inescapable.
This was the conclusion of many of the ‘founding fathers’ of quantum mechanics. Erwin Schrödinger, the discoverer of the fundamental quantum equation, for instance, came to the conclusion that:

Mind has erected the objective outside world … out of its own stuff.²⁸

And Max Planck, the physicist who inadvertently initiated the quantum revolution, came to a similar conclusion:

All matter originates and exists only by virtue of a force… We must assume behind this force the existence of a conscious and intelligent Mind. This Mind is the matrix of all matter.²⁹

More recently, in an article in the New Scientist (23rd June 2007) Michael Brooks, commenting on quantum entanglement experiments carried out by teams led by Markus Aspelmeyer of the Austrian Academy of Sciences and Anton Zeilinger of the University of Vienna, tells us that the conclusion reached by the physicists involved is that:

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²⁸ Schrödinger, E. (1944) p121.

²⁹ Das Wesen der Materie” (The Nature of Matter), speech at Florence, Italy, 1944 (from Archiv zur Geschichte der Max-Planck-Gesellschaft, Abt. Va, Rep. 11 Planck, Nr. 1797)
… we now have to face the possibility that there is nothing inherently real about the properties of an object that we measure. In other words measuring those properties is what brings them into existence.\textsuperscript{30}

This conclusion agrees with the fundamental insight of the Madhyamaka, or the Buddhist Middle Way analysis, that all phenomena lack ‘inherent existence’ or, to use Buddhist technical terminology, all phenomenon lack \textit{svabhava} (‘own-nature’ or ‘inherent existence’). Thus Vedral, in his recent book \textit{Decoding Reality}, has concluded that:

Quantum physics is indeed very much in agreement with Buddhist emptiness or No-self.\textsuperscript{31} Emptiness or No-self is, in one aspect, the Buddhist concept of a fundamental non-substantial ‘empty’ ground of potentiality which gives rise to the multitudinous productions within dualistic experience through the operation of an internal primordial activity of cognition. Within Dzogchen (the ‘Great Completeness’ teachings) for instance the ultimate nature of reality is characterised as being a fundamental ground comprised of ‘emptiness and cognition inseparable’, or ‘empty cognizance’.\textsuperscript{32} And this

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\textsuperscript{30} Michael Brooks: ‘The Second Quantum Revolution,’ New Scientist 23\textsuperscript{rd} June 2007
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\textsuperscript{31} Vedral, Vlatko (2010) p200
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\textsuperscript{32} Schmidt, Marcia Binder (Editor) (2002) p29
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is the kind of vision of the process of reality which Vedral considers is
necessitated by the evidence of quantum theory:

The Universe starts empty but potentially with a huge amount of
information. The first key event is the first act of symmetry breaking…

The results of quantum experiments indicates quite clearly that
quantum reality consists of a field of non-substantial (using the term
‘substantial’ here to indicate materiality) potentiality which is triggered into
experiential manifestation through the operation of the cognitive activity of
consciousness. This perspective is indicated in the most recent quantum
proposal that quantum reality is ‘epiontic’, as quantum physicist Wojciech
H. Zurek has indicated:

…quantum states, by their very nature share an epistemological and
ontological role – are simultaneously a description of the state, and the
‘dream stuff is made of.’ One might say that they are *epiontic*. These two
aspects may seem contradictory, but at least in the quantum setting, there is a
union of these two functions. This cogent insight makes clear that, at the
quantum level, being and knowing, perception and reality, epistemology and

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33 Vedral, Vlatko (2010) p211
‘Quantum Darwinism and envariance.’
ontology, are inextricably entangled. The ‘epiontic’ nature of the fundamental quantum ground, therefore, indicates that in some manner perception creates the ontological fabric of reality. The ‘first act of symmetry breaking’, then, is an act of primordial consciousness.

In fact Buddhist philosophers have known about the dream-like nature of the universe for at least two thousand years:

…When we see houses and fields in dreams, we think of them as being external objects that are not created by the mind, even though they are nothing other than projections of our mind. All that we see when we are awake is also nothing other than a creation of the mind.35

And the Buddhist metaphysical perspective of the Chittamatra, or Mind-Only, philosophy actually gives an indication of the kind of quantum-perceptual mechanism that might be operating at the quantum level in order to create the extraordinary universal dream of the material world and its inhabitants: The entire world was created through latent karmic imprints. When these imprints developed and increased, they formed the earth, the

35 Thrangu Rinpoche, Kenchen (2001) p16
stones, and the seas. Everything was created through the development or propagation of these latent karmic potentials.\textsuperscript{36}

According to the Buddhist worldview all actions performed by all unenlightened beings, including seemingly neutral perceptions, cause repercussions. Karma-vipaka, action and resultant effect, action and feedback, is the universal process of cause and effect which operates on all levels of reality, including the appearance of a material world. This means that there is a dimension of the operation of karma which is involved in the manifestation of what we perceive as an external ‘material’ reality:

\ldots since beginningless time we have been perceiving sights, sounds, smells, tastes and bodily sensations and these perceptions have been creating imprints or latencies in the ground consciousness. Habituation of having experienced a certain visual form will create latency for that very form. Eventually, that latency will manifest from the ground consciousness as a visual form again, but it will be perceived as external to ourselves.\textsuperscript{37}

In other words all the entities and objects of the ‘classical’ world emerge from the potentiality of the quantum realm in a similar fashion to the

\textsuperscript{36} Thrangu Rinpoche, Kenchen (2001) p28

\textsuperscript{37} Thrangu Rinpoche, Kenchen (2001) p34-35
way that rainbow appear. They are brought into experienced reality through an interaction of a deep level of consciousness and a quantum realm of potentiality.

The rainbow analogy is also employed within Buddhist exegesis:

By virtue of its all-penetrating freedom this Awareness that has no centre or circumference, no inside or outside, is innocent of all partiality and knows no blocks or barriers. This all-penetrating intrinsic Awareness is a vast expanse of space. All experience of samsara and nirvana arises in it like rainbows in the sky. In all its diverse manifestation it is but a play of mind.38

An example which is often used to illustrate the three natures is that of a mirage. The three natures may be likened respectively to (a) the mistaken belief that water exists in a mirage; (b) the appearance itself of the mirage, dependent on atmospheric causes and conditions and the presence of the observer, and (c) the empty nature of the mirage, inasmuch as it is completely dependent on causes and conditions, including the observer. The belief that water exists in the mirage is completely false and is similar to the imaginary, or illusory, nature. The causes and conditions which give rise to

38 Dowman, Keith – Flight of the Garuda
the appearance of the mirage are similar to the dependent nature. The empty character of the mirage, inasmuch as it is dependent and conditioned and exists nowhere except in the mistaken mind of the observer, is similar to the thoroughly-established-nature. The belief in the mind of the observer that there is water in the distance corresponds to the imputational nature.

This analysis can be likened to the quantum situation. The realm of quantum potentiality which includes the observing consciousness or consciousnesses, provides the interdependent ground of potentiality which constitutes the other-powered nature and, because there is a tendency within the process of reality for the inner nature of this ground to misperceive itself, a realm of seemingly independent and inherently existent phenomenon manifests within an illusory field of duality.

It is important to comprehend the fact that the ‘three natures’ analysis describes a deep process of reality functioning at a level of mind corresponding to the quantum level. The Mind-Only analysis asserts that the play of the dualistic world of appearance emerges from a deep nondual realm because of an internal function of cognition which misperceives itself as being divided. The dualistic world is the illusory domain of the ultimately non-existent imputational or imaginary nature, which is the domain of
experienced duality of apprehender-apprehended, subject-object. The relationship between the conventional arena of the experienced ‘material’ world, which seems to emerge through the apparent transition from the quantum state to the ‘classical’ state, which is called the ‘collapse of the quantum wavefunction’, can be likened to the ‘superimposition’ of the imputational nature onto the field of other-powered potentiality. In this analogy the sun, raindrops and observer correspond to the other-powered realm of interdependent phenomena and the appearance of a seemingly external rainbow corresponds to the imputational nature. The Mind-Only perspective uses the term ‘imputational’ to indicate not just a surface conceptual imputation but a directly experienced sensory imputation such as the rainbow example. The rainbow does not exist at all as an independent phenomenon, it is therefore ‘imaginary’, This corresponds exactly to the quantum situation because, although all the phenomena of the everyday world clearly are overwhelmingly convincing as being independent of mind and self-existent phenomena, quantum theory tells us this is not so at all. Furthermore quantum theory tells us that all phenomena are like this; they are ‘illusions’ generated out of the quantum realm of potentiality by the operation of mind.
People, in general, tend to get caught up in their own lives to the point that they neglect to analyze the fact that reality itself transcends both time and space. The evils that exist in the world today are not independent entities. They are entirely dependent upon misconceptions that stem from the human instinct to separate itself. Perhaps this calls for an attempt to adjust one's mode of thinking. Whether science or spirituality is what motivates he or she to change, both ideologies call for an imminent re-examination of self.

The fundamental problem in quantum physics can be illuminated by a candle. As a candle emits a single photon (a particle of light), a scientist can determine with extraordinary precision its probability of being in any one place. A probability ‘wavefunction’ is said to emanate from the source, and the photon can be anywhere allowed by that wavefunction. The details are computed by the celebrated Schrödinger equation. The problem comes when you observe the photon, and discover where it actually is. At this moment, the wavefunction ‘collapses’ from a cloud around the candle to a single point. This has led to a large number of metaphysical speculations. How does the wavefunction ‘know’ it is being looked at? How can quantum mechanics be formulated without recourse to the idea of the conscious observer, outside the system, initiating that collapse? This is the
problem. They would see that their universe is purely subjective. Nothing is objective. Everything is relative to the observer: space, time, truth. From an Archimedean perspective (outside the ‘multiverse’), you can see what you like in the universe. It makes no sense to single out one person, one universe, one set of physical laws or constants.

The fundamental particles such as electrons and photons do not have any obvious causes. Either they always have been there or else they come into existence as the result of random quantum events. Neither do they have anything in the way of observable parts (otherwise they wouldn't be fundamental). So when we examine an electron or photon, we are looking at a phenomenon in which the two grosser ways of existing are relatively inapparent. As the two grosser levels are not clamouring for our attention, Kadampa metaphysics would predict that the very subtle level of dependent relationship (in dependence of imputation by mind) should manifest itself. It is important to emphasise that the mathematical equations of quantum physics do not describe actual existence - they describe potential for existence. Working out the equations of quantum mechanics for a system composed of fundamental particles produces a range of potential locations, values and attributes of the particles which evolve and change with time. But for any system only one of these potential states can become real, and - this
is the revolutionary finding of quantum physics - what forces the range of
the potentials to assume one value is the act of observation. Matter and
energy are not in themselves phenomena, and do not become phenomena
until they interact with the mind. These experimental aspects of sunyata are
described in quantum phenomena.

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the potentials to assume one value is the act of observation. Matter and
energy are not in themselves phenomena, and do not become phenomena
until they are observed. The following experiments give some feel for the
interaction of mind with matter at the fundamental level of existence.

All of the quantum phenomena that we have explored in this
overview display a behavioural profile which is completely at odds with any
kind of notion that anybody ever had concerning independently existing,
objective matter. However, we have seen occasions when the employment
of the term ‘matter’ actually undermines the insights of quantum theory by introducing an inappropriate ‘classical’ flavour into the fluid, evanescent appearance of quantum reality. We have also seen that seminal experiments clearly indicate that quantum elements have modes of interacting and modes of being which are completely at variance with classical matter.

The comparison between Buddhist thought and quantum mechanics is especially convincing because it has the power to motivate those driven by faith and fact. The Theory of Emptiness appeals to those who are driven by spirituality, while science provides an experimental basis for proving reality is not always as it appears to be. Both schools of thought, however, recognize the utter importance of putting everything in perspective. If on the Quantum level, matter is revealed to be less solid and definable than it appears, then it seems that science is coming closer to the Buddhist contemplative insights of No-self and interdependence.

In the Buddhist view, the self is nothing more or less than the dynamic aggregation of a bundle of interrelated causal processes. This aggregation was variously analyzed, most simply into its basic psycho-physiological polarity (naama-ruupa), and that in turn was further analyzed into the five parallel processes of physiological form (ruupa), karmic formations (sa.mskaara), cognition (sa.mjña), feeling (vedanaa) and
discriminative perception (vijñāana). Of the various constituent processes making up the self, the karmic "formations" or predispositions are of the greatest ethical interest. These were identified the latent or unconscious tendencies (biija or vaasanaa) laid down as patterns of habituation through the performance of action (karman), actions not just of the body, but of speech and mind as well. Arising thus from previous activity, this karmic conditioning in turn shapes future actions, and these conditioning forces or energy patterns are not only multiple but of varying direction and intensity. We are, in this view, quite literally the (ever changing) sum of our habits. Or we might imagine the self as an extremely complex vector problem, the sort of mathematical exercise where one must identify both the direction and the velocity of different forces operating on an object in order to determine its trajectory from that point forward. In the Buddhist conception of the self, the particular ethical tendency or force of each of the currents of karmic conditioning is playing itself out, influencing and being influenced by each of the others. The self is thus a complicated and ongoing interactive process, the immediate configuration of which determines the overall trajectory of the being, a trajectory that is constantly being altered as each moment brings a new equation of interacting conditionings—some newly created through current activity, others carrying over as the continuing influence of previous
actions. But does this conception of the self allow any degree of choice or creativity? Obviously one’s response in any given situation must be strongly shaped, indeed determined, by those very patterns of habituation that are the sum of one’s identity. Where is there opportunity for any new input, for any new departure seeking to break out the well-worn ruts of previous habituation?

Prior to reaching the goal of enlightenment, the range of possibilities available to a given individual in any given moment is significantly restricted or determined—this is precisely point of the Buddhist conception of liberation. Enlightenment is not just freedom from suffering; it is freedom to act in a creative, compassionate manner, unlimited by the constraints of prior delusion in the form of conditioned reactivity linked to a false and overly self-referential conception of personal identity. But just as the rejection of the atman threatened to undermine karmic efficacy, this non-substantial and dynamic conception of the self seems to allow no opportunity for transformation once the karmic patterns have been established. Once the ruts are set, how is one to break out? Here we encounter another axiomatic assumption of Buddhism, one so fundamental and unquestioned that it is made explicit only in response to later criticism from outside the tradition. The potential for enlightenment is seen as itself
part of the karmic conditioning of all beings. Within the *sa.mskara*s that constitute one’s identity are also certain tendencies conducive of liberation and enlightenment, not just those that tend towards perpetuating the bondage of greed, hatred and delusion. Indeed among these ethically and soterically positive conditionings is the possibility of volitional choice itself (*cetanaa*), a karmic formation that emerges in all beings quite naturally once sentience or consciousness is sufficiently developed to sustain that particular degree of self-conscious awareness. These positive conditionings or "wholesome roots" (*kuusalaani muulaani*) as they were known in the early tradition are subsequently referred to in the Mahayana as one’s Buddha Nature or as the "embryo" of enlightenment (*tathaagata-garbha*). We can thus see that the Buddhist understanding of basic human nature is thus profoundly optimistic, even as it stresses just how deeply rooted the inclinations of ignorance and craving tend to be. While a volutaristic effort is indeed necessary before the potential for enlightenment is actually realized, beings have *by nature* both the impetus and the latent "roots" that will eventual yield the flower of liberation.

While these latent positive tendencies do constitute the *potential* for enlightenment, and while they are considered part of the karmically conditioned endowment of all beings, they must nonetheless be actively
cultivated. They must become fully developed before the enlightenment will actually be realized. And this process of cultivation and development is itself part of the on-going process of conditioning and re-conditioning that constitutes the "individual." Some various formulations of the *praxis* the early Buddhists advocated for realizing the goal of enlightenment or liberation. For now it will suffice to point out that this *praxis* is perhaps best understood as a process of cultivating those specific karmic patterns that manifest as a particular set of virtues both cognitive and affective, areteic qualities such as wisdom and compassion associated with the enactment of enlightened awareness. Buddhist soteriology thus manifests many features of an Aristotelian virtue ethic, but with one significant difference.\(^{39}\) Since the basic nature of the self is dynamic rather than substantially fixed or given, the *telos* towards which the Buddhist develops, indeed the *logos* which he or she eventually realizes is something that must be cultivated or developed. And this process of development extends beyond one’s immediate existence as a human self. Unlike the substantialist notion of personal identity deriving from both the Judeo-Christian and Greek roots of Western thought, the Buddhist self is seeking to realize a set of virtues that are not understood as

innately given human qualities. They are qualities potential in our very sentience, yet they are neither given nor human. They are "trans-human" potentialities and in actualizing them one must go beyond the very "humanness" of one’s sense of identity. Human beings are thus "half-baked beings" as it were beings who have made significant progress in cultivating and refining their basic sentience into progressively higher degrees of awareness, yet beings that have some way to go nonetheless. Through this praxis of cultivating the perfections of the enlightened being, the Arhat or Buddha, the human Buddhist is moving well beyond what it is simply to be human, just as he or she began that process well short of what it is to be human. There is a clear ontological continuity from human to Buddha, indeed from banana slug to Buddha—certainly no discontinuity of the degree that distinguishes the Creator from the created. It is in this sense Buddhahood is seen as "trans-human," as a manner of being that takes one well beyond the status of "human being."  

We must now explore yet another closely related assumption, the notion that the potential for enlightenment is characteristic not just of

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40 The Buddha makes it quite clear that he is not to be considered a human being (or any other samsaric life-form) in his encounter with the Brahmin Do.na recorded at A 2.37f.
humans, but of all sentient beings, the view that the eighth-century Buddhist poet Shantideva expresses with the poignant assertion that:

Even though who are, were gnats, mosquitoes, wasps, and worms, have reached the highest Awakening, hard to reach, through the strength of their exertion.\textsuperscript{41}

This assertion of a cosmic "principle of self-transcendence" as the contemporary Buddhist philosopher Sangharakshita has termed it is one that might well be challenged, to be sure, yet it is one that has remained axiomatic throughout the history of Buddhism.\textsuperscript{42} Once we see that Buddhahood is the teleological goal, not just of human existence, but of all sentient existence, we begin to see that the "human self" must be viewed in a much broader perspective. Not only must it be seen as dynamic and developmental; it is by its very nature a being—or rather a \textit{becoming}\textemdash that is thus fundamentally trans-human. And it is only when seen in this broader context that the radical difference between Buddhist and Western views of the self begins to fully emerge.


What quantum theory says is that fundamental particles are empty of inherent existence and exist in an undefined state of potentialities. They have no inherent existence from their own side and do not become 'real' until a mind interacts with them and gives them meaning. Whenever and wherever there is no mind there is no meaning and no reality. This is a similar conclusion to the Buddhist teachings on No-self and interdependence. As the Buddha taught, individual things neither exist, nor do not exist. The three signs of being, the characteristics common to all life, are impermanence, suffering, and an absence of a self.