

Buddhism and Science

Collected Essays

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Buddhism and the Scientific Revolution

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It is a historical fact that the scientific revolution which took its rise in the seventeenth century in the West was largely responsible for upsetting the earlier religious conception of the universe. Not only did science controvert the specific dogmas of Western religion, but it seemed to have undermined the foundations as well as the fundamental concepts implicit in the religious outlook on things.

The new cosmology of Copernicus, Galileo and their successors altered the geocentric picture of the universe although it was pronounced to be "contrary to the Holy Scriptures." The new biology (the theory of evolution) upset the doctrines of the special creation and the fall of man. And the new psychology seemed to show that man's mind like his physical body worked on a pattern of causal law and that however deep one plumbed into its depths there was not discoverable in it an unchanging soul which governed its activities entirely.

But much more serious was the effect of the scientific outlook on the general religious attitude which involved a belief in a personal God, in purpose and in the objectivity of moral values. Science made its discoveries and progressed quite comfortably on the assumption of universal causation without the necessity for teleological explanations or divine intervention. It dealt with an amoral universe indifferent to the aspirations of men. As among men, moral values like economic values were subjective since they were dependent on the needs and desires of men, and an ethical humanism was the best that could be hoped for. Even such an ethics need not be universal, for, as anthropologists discovered, different societies seem to have followed different moral codes which suited them and ethical relativism was the scientific truth about the nature of moral values.

Of course, there are those who still cling to the dogmas in the face of science or believe in them in a non-literal sense. But the position remains very much the same although people are no longer optimistic (after two world wars and in the throes of a third) about the ability of science to usher in a brave new world of peace and plenty. It has also been granted that mechanistic explanations of the universe need not necessarily rule out teleological ones. Science too has given up the crude materialism of the eighteenth century and scientists no longer attempt to explain the universe on machine models, while some scientists have denied that strict determinism holds in the sphere of the atom. But all this is still a far cry from religion.

What place would Buddhism occupy in such a context? Are its dogmas and attitudes no better or no worse than those of any other religion? Some Western writers on religion seem to have assumed that this was so, but if one reads through the Buddhist texts, one begins to wonder whether the scientific revolution would have at all affected religion adversely if it had taken place in the context of early Buddhism.

I say this because I find that early Buddhism emphasises the importance of the scientific outlook in dealing with the problems of morality and religion. Its specific dogmas are said to be capable of verification. And its general account of the nature of man and the universe is one that accords with the findings of science rather than being at variance with them.

To take this last point first, we find for instance that the early Buddhist conception of the cosmos is in essence similar to the modern conception of the universe. In the Pali texts that

have come down to us we are literally told that hundreds and thousands of suns and moons, earths, and higher worlds, constitute the minor world system, that a hundred thousand times this is the middling world system, and a hundred thousand times the middling world system is the major world system. In modern terminology it would seem as if a minor world system (*cūlanikā-loka-dhātu*) is a galaxy of which we observe about a hundred million through our best telescopes. The Buddhist conception of time is equally immense.

There is, of course, no theory of biological evolution as such mentioned in the Buddhist texts, but man and society as well as worlds are pictured as changing and evolving in accordance with causal laws.

Then in psychology we find early Buddhism regarding man as a psycho-physical unit whose "psyche" is not a changeless soul but a dynamic continuum composed of a conscious mind as well as an unconscious in which is stored the residua of emotionally charged memories going back to childhood as well as into past lives. Such a mind is said to be impelled to act under the influence of three types of desires—the desire for sense-gratification (*kāma-taṇhā*), the desire for self-preservation (*bhava-taṇhā*) and the desire for destruction (*vibhava-taṇhā*). Except for the belief in rebirth, this conception of the mind sounds very modern, and one cannot also fail to observe the parallel between the threefold desire in Buddhism and the Freudian conceptions of the *eros*, *libido*, and *thanatos*.

I have brought out these similarities not with the intention of showing that Buddhism teaches modern science, but that the scientific revolution does not have the same adverse effect on Buddhism as it had on another religious traditions.

Now let us turn to the content of Buddhism as a theory about the nature and destiny of man. First of all it holds that the honest impartial search for truth even in matters moral and religious is no bar to one's spiritual progress. On more than one occasion the Buddha has admonished honest seekers after the truth in the following words: "You have raised a doubt in a situation in which you ought to be uncertain. Do not accept anything because it is rumoured so, because it is the traditional belief, because the majority hold to it, because it is found in the scriptures, because it is the product of metaphysical argument and speculation, or after a superficial investigation of facts, or because it conforms with one's inclinations, because it is authoritative or because of the prestige value of your teacher." Critical investigation and personal verification was to be the guide to true morality and religion. "If anyone were to speak ill of me, my doctrine and my order," says the Buddha, "do not bear any ill-will towards him, be upset or perturbed at heart, for if you were to be so it will only cause you harm. If on the other hand anyone were to speak well of me, my doctrine and my order, do not be overjoyed, thrilled or elated at heart, for if so it will only be in your way of forming a correct judgement as to whether the qualities praised in us are real and actually found". A scientific outlook was thus considered necessary not only for discovering the truly moral and religious life but even for the continual self-examination which such an outlook demands.

The field of moral and religious phenomena is, again, not a realm of mystery but one in which the law of cause and effect holds. The principle of causal determination, namely that A is the cause of B if "whenever an event A occurs an event B occurs, and B does not occur unless A has occurred" is laid down by the Buddha in these very terms, and he further states that he "speaks only of causes and of things which arise from causes." Thus all phenomena, including moral and spiritual experience (with the sole exception of Nibbāna which is not a conditioned phenomenon) are said to be conditioned by causal laws. Such laws are classified according to their sphere of operation as physical laws (*utu-niyāma*), biological laws (*bīja-niyāma*), psychological laws (*citta-niyāma*) and moral and spiritual laws (*dhamma-niyāma*).

Now there are three laws which are said to govern the life and destiny of the individual. They are the law of continuity which makes for the persistence of individuality (bhava), the law of moral retribution (*kamma*) whereby morally good acts tend to result in pleasant consequences for the individual and morally evil acts in unpleasant consequences, and finally, the law of causal genesis (*paṭiccasamuppāda*) which is intended to explain the above two laws.

The law of continuity, popularly known as rebirth, ensures the persistence of the dynamic unconscious of the individual with the death of the physical body. If this unconscious is not attuned to higher worlds by the moral and spiritual development of the individual, it is said generally to persist in the spirit-sphere (*petti-visaya*) as a discarnate spirit, and subsequently gets reborn as a human. Critics of Buddhism often suggest that this theory of rebirth is dogmatically accepted or taken for granted in Buddhism but a careful study of the texts would show that this is not the case.

Buddhism arose at a time when there was intense speculation on the problem of survival. There were also several schools of materialism, all of which denied survival altogether and there were the sceptics who merely doubted the possibility of survival. Even experiments such as the weighing of the body immediately before and after death were performed in order to discover any evidence of survival. One of the materialist theories mentioned and dismissed by the Buddha was that consciousness was a by-product of the material elements being mixed up in certain proportions to form the organic body—in the same way in which the red colour is produced by suitable mixtures of betel, areca-nut and lime (none of which is red). Several such materialistic theories, as well as a number of one-life-after-death-theories, some of which held that the soul was conscious after death, others that it was unconscious (but existing), and yet others that it was super-conscious after death, are examined and disposed of by the Buddha. The theory of rebirth is offered as one capable of being verified by developing the faculty of seeing our former births, a potentiality which is said to be within the reach of all of us.

Rebirth is therefore not a dogma to be accepted on faith but a hypothesis capable of being scientifically verified. The available evidence for rebirth today is roughly of two sorts.

There is the spontaneous evidence of numerous people from both East and West who have claimed to remember their past lives, in some cases of which the memories have been confirmed by further investigation (e.g., the case of Shanti Devi, *Illustrated Weekly of India*, December 15, 1935. The case of Nellie Horster, *Milwaukee Sentinel*, September 25, 1892). There is also the more reliable and more abundant evidence of psychiatrists and psychologists who have discovered that under hypnotic trance the subject's memories can be traced back not only to childhood but to prior earth lives as well, in some cases of which the facts have been verified (e.g., A. de Rochas, *Les Vies Successives*, Bibilothèque Charcomac, Paris; Ralph Shirley, *The Problem of Rebirth*, Rider & Co., London; Professor Theodore Flournoy, *Des Inde a la planete Mars*; Professor Charles E. Cory, "A Divided Self"; Article in *Journal of Abnormal Psychology*, Vol. XIV, 1919).

The law of moral retribution or kamma as taught in Buddhism has also been criticised on the grounds that it amounts to fatalism. This again is due to ignorance of the Buddhist teaching. Causation in Buddhism is carefully distinguished by the Buddha on the one hand from strict determinism and on the other from indeterminism. The Buddha argues that if everything was determined, then there would be no free will and no moral or spiritual life would be possible and we would be slaves of the past; and on the other hand, if everything was undetermined (*adhicca-samuppanna*) or fortuitous, then again the moral and spiritual life would not be possible, for the cultivation of moral and spiritual values would not result in

moral and spiritual growth. It is because the world is so constituted that everything is not strictly determined or completely undetermined that the religious life is possible and desirable, according to the Buddha.

In order to explain rebirth and kamma, some of the Upanishadic thinkers who accepted these doctrines had to recourse to the concept of *ātman* or a changeless soul. The individual continued to be the same because he had a permanent soul which was the agent of all the actions of the individual as well as the experiencer of their fruits. The Buddha was quick to see that such metaphysical entities explained nothing and that it was meaningless to assert or deny an unverifiable entity. He therefore rejected the concept of soul while maintaining the doctrine of the observable continuity of the individuality, and explained the above two laws of continuity and moral retribution in terms of all the verifiable phenomenal factors which determine the continued genesis and growth of the individual. This is too elaborate to be set out in detail. In brief, it describes how the individual is conditioned by his psychological past (going back to past lives which set the general tone of his character) and the genetic constitution of his body derived from his parents, and continues to act in and react with his environment accumulating the experiences of this life in his evolving consciousness (*saṃvattānika-viññāṇa*), which continues after the death of the body if the threefold desires in it be still active.

Personal and direct knowledge of the operation of these three laws constitutes the threefold knowledge (*tisso vijjā*) which the Buddha and his disciples claimed to have. The awareness of the fact that and the way in which one is being conditioned is said to result in one ceasing to be conditioned, a state which corresponds to the attainment of the unconditioned and supreme felicity of Nibbāna. This is salvation in Buddhism which is literally salvation from the bondage of finite conditioned existence.

Strictly, Nibbāna is said to be beyond description or conception, the reason given being that it is a state so radically different from the type of existent things which we can conceive of that no meaningful description or definition of it can be given in conceptual terms. It is said that to say that one “exists” in Nibbāna is wrong, for existence is a concept that applies to phenomenal things and has reference to space and time, for Nibbāna is “timeless, in that one cannot speak of it as being in the past, present or future,” is not located in space and is not causally conditioned unlike all phenomenal things: but it is also said to be equally wrong to say that one “does not exist” in Nibbāna since this implies a state of oblivion and annihilation. Nevertheless both positive as well as negative descriptions are given though they are not to be taken as exact definitions, as Nibbāna is—beyond the scope of logic.

Negatively, Nibbāna is the absence of all unhappiness, and all phenomenal existence is said to be infected with unhappiness; we are unhappy either because we experience mental or physical pain and have forebodings for the future, or because the pleasant experiences that we have are insecure and never lasting. This is to take a realistic view of life even in the face of the fact that as the Buddha says “human beings enjoy on the whole more pleasant experiences than unpleasant ones,” and therefore it would not be correct to call it pessimism since it has nothing to do with wishful thinking. Positively, Nibbāna is described as a state of “supreme felicity” (*paramaṃ sukhaṃ*).

The way of salvation is described as an eightfold path in which the first step is that of right understanding and living in accordance with the true philosophy of life, and as a result having right aspirations, right speech, right actions, right mode of living, and right mindfulness, culminating in the growth of religious joy and the spiritual and intuitive awareness of right meditation or contemplation. The full fruit of right contemplation, however, can be reaped by those giving up the active social life for the contemplative life.

This meditative life is characterized by the stages of personal mystical consciousness (*rūpa-jhāna*) and impersonal mystical consciousness (*arūpa-jhāna*) culminating in the attainment of Nibbāna. With the growth of his mind and spirit there are said to emerge certain faculties latent in him, such as telepathy and clairvoyance and the ability to see his past lives. These cognitive faculties, as explained earlier, make it possible for the individual to realise the conditioned state in which he is, and thereby to attain the Unconditioned. Considering the requirements of the path, the Way to Nibbāna is therefore described as the culmination of a person's moral development (*sīla*), intuitional or spiritual development (*samādhi*) as well as his intellectual or cognitive development (*paññā*). The Buddha was once asked "whether he hoped to save one-third of the world, one-half of the world or the whole world by offering this Way of Salvation," to which he replied that he did not claim to save one-third of humanity, but that just as a skilful doorkeeper guarding the only entrance to the palace knows that all those who seek the haven of this palace must enter by this door, even so all those in the past who were saved, who in the present are being saved and who in future will be saved, have entered, are entering and will enter by this door.

Such is the teaching of early Buddhism which is offered as a self-consistent scientific hypothesis touching the matters of religion and morality which each person can verify for himself. In fact, not being based on revelation, the fact that it has been verified by him and hundreds of his disciples and is capable of being verified by every earnest seeker is put forward as the criterion of its truth by the Buddha. The empirical and pragmatic test of science is, for the Buddha, the test of true religion. The faith that he requires is the trust that is required to put to the test a certain philosophy of life by devoting one's entire being to living it every moment of one's life. And its worth is to be realised by its fruits by each person for himself. Like the scientists working in other fields, the Buddhas or the Perfect Ones have merely discovered these truths which are there for all time and have preached them for the good of the world. Each one has to seek and work out his own salvation; no one can save another and the Perfect Ones do merely point the way.

It would be seen that such a religion is in accord with the temper and the findings of science, so that Buddhism is not likely to be at variance with science so long as scientists confine themselves to their methodology and their respective fields without making a dogma of materialism.

As for purpose, the Buddhist view is that the world as such has no purpose to accomplish though individuals in it may choose their own ends and thus make their lives purposeful, the end recommended by Buddhism being Nibbāna. The Buddha would argue that if the world had a purpose to be attained in a final consummation, then either salvation would be assured for all or some would be fore-doomed and damned for eternity; but according to the Buddha there is no necessity or inevitability in progress; no one is destined to attain Nibbāna unless he wishes to. But as for moral values Buddhism upholds their objectivity, for according to the Law of Kamma, a drunkard, for instance, unless he repents (i. e. changes his ways) tends to be reborn as a moron whatever the opinions or wishes of the drunkard or the members of his society may be.

The Relation of Buddhism to Modern Science

Robert F. Spencer M.A., Ph.D.

There can be no question that Buddhism is the one system, excepting perhaps science itself, which achieves an objective and detached view toward the nature and destiny of man. This

striking objectivity divorces the Buddhist system from the realm of religion and allies it at once with the kind of scientific search for truth which characterized India in the Gupta and other early periods of its civilization and which affords a major preoccupation to most of the intellectual world—both east and west—of today. Buddhism, this writer contends, is not properly a religion; it is a system for life and living in a world which is circumscribed with difficulty and beset with suffering. Buddhism is not a religion, if, in scientific terms, we define religion as the mystic experience, the psychic thrill. It is not a religion because it de-emphasizes faith in the unknown and unknowable and it rejects dogmatism. However much these latter features may obtrude themselves in Buddhist lands, no serious student can regard them as other than superfluous growths, digressions from the scientifically conceived Dharma of the founder. This paper holds that in the strictest sense, Buddhism as a system and scientific endeavour as a comparable system are one.

But there is also a difference: the Buddhist thinker is clear as to his aims; if he uses science and its methods, he does so with the realization that science is a means to an end and not an end in itself. In other words, the Buddhist sees in science reflections of principles expressed and reiterated by the Lord Buddha at a time when there was no absolute methodology of science as such. Since today the world is wedded to the methods of science, we have only to note how wholly compatible with science is the system founded in India over 2,500 years ago. Modern scientific achievement serves merely to lend added perspective to the concepts of impermanence, of the illusory quality, and of *anattā* which were put forth so long ago. As an end in itself, science may solve immediate problems; it feeds more people so that there are more people to feed; it prolongs life and finds more effective means of destroying life. Science as viewed today, is a method, no more, and to make a cult of it, to find in it the answer to problems and questions of the ultimate forms of human destiny is rank error. It is making a dogma of science where no religious emotion or attitude is ever intended. This indeed was the fallacy of some of the sectarian forms of ancient Hinduism: in seeking to explain the universe by means of an atomic theory, however correctly conceived, the Brahmins of India of the past stopped dead and found human salvation, if such it may be called, in science and sciencing. Nor is the contemporary world too different despite the fact that the scientific goal is material rather than spiritual. The method of science admits primarily the formulation of an hypothesis; the testing of that hypothesis, and the stating of new hypothesis, predicated on knowledge obtained by such experimentation. The Lord Buddha experimented with ideas, not with things—he employed the crucible of life in which to measure human experience and he came up with a detached and tested answer.

Science is characterized by its tough-mindedness. The search for truth is not always easy, nor indeed, always pleasant. It has been said that the truth may hurt. It does, but it remains truth for all that. Pristine Buddhism offers an attempt, a successful one, it may be added, to come to grips with truth in an objective way. To those of us who, now living, are seeking a few moments of respite, of surcease from worry, in short, what might be called happiness, the Buddha says in effect: “All right, just remember, it doesn’t last; it may be here today but it is never permanent.” Just as science seeks to define its answers, objectively, without emotion, so also does Buddhism hit squarely at the target and, free from emotional stress, informs us concisely what is what. We may not like it and we may have to toughen ourselves to take it, but it is proven.

An example of the kind of scientific “tough-mindedness” which the Buddhist has to take is seen in the concept of kamma. What indeed could be simpler and yet what could be more -scientifically conceived? If one chooses, one may take on faith, to be sure, the saṃsāra principle. Objectively, however, previous existences, however envisioned in time or space, remain a matter of complete indifference. What is significant is that “I” am not the same

individual that "I" was yesterday, a year ago, or even a moment ago. Ego has changed, physical form has changed, however imperceptibly. Moreover, the "I" of the individual, having volition, free will, can and does act. Acts, however, are pre-conditioned by foregoing acts. A deed of to-day begets its effects of tomorrow, effects of future action and thought. To the view of this writer, this is the karmic principle with meaning and application. It is scientific; there is nothing esoteric about it.

So much has been said regarding the relations between Buddhism and the natural sciences that it is scarcely worth belabouring the point further here. The nature of matter, the nature of physical reality, problems of space and time are all implicit in Buddhist teachings. This writer must confess that he cannot care less about such mystical relationships as are conceived as between mind and matter. His interests lie in the connections between Buddhism and the social sciences, that wide area which seeks to understand the relation between man and man, not that between atom and unpopulated universe.

In such social sciences as anthropology and sociology, an attempt is made to understand how men behave in groups and why they act as they do. A related aspect is seen in economics and in its handmaiden, political science. Still further, may be added, the discipline which seeks to evaluate the individual, psychology. In all of these fields, one thought becomes paramount: human beings act because of their conditioning; the anthropologist would say because of their cultural heritage. We come to realize that what one people regards as right, another may view as wholly wrong. The social sciences teach the relativism of human behaviour.

Granted that human behaviour be relative, it follows that there are no absolutes of good or evil. Indeed, good and evil, as concepts, are likewise wholly relative. As a trained social scientist, one who has information regarding the differing ways of the peoples of the world, the writer believes this. Only in Buddhism is some order restored from the resulting chaos. Note that the Buddha does not say: "Thou shalt not ..." He does say that it is a good idea to avoid certain kinds of behaviour and he issues a series of wholly positive injunctions on his followers. Regardless of background, regardless of belief, regardless of economic or political systems, Buddhism has application. It makes sense as nothing else can to restore balance to men. Not that it is even desirable to effect a balance from the Buddhist point of view. To realize the concept of *anicca* is unquestionably for all men enough.

But the Buddhist could assist his own goals by a realization of the objectivity of the social scientist. Here the scientist takes the view of detachment toward his fellow man. He does not seek amelioration. The Buddhist can and should do the same; by so doing, he may achieve by indirection solutions to the problem of human suffering. The Lord Buddha realized that the man who helped himself would inevitably help others. He comes concretely to grips with problems of society and personality. Psycho-analysis may in some measure be compared with enlightenment, but the enlightened man does not need to be told how to live with his fellows. The nature of enlightenment brings this inevitably about. The Buddhist can adopt the contemplative detachment of the scientist. In so doing, he makes himself a better Buddhist and follows infinitely more closely the basic precepts. Objectivity in human affairs remains his watchword.

Science and Buddhism

Upāsaka Wu Shu (Loo Yung Tsung)

New theories in physics reveal the following facts:

The simplest part of matter is, at present, supposed to consist of protons and electrons. Around the electrons there are lines of magnetic force. The influence of these lines is theoretically universal. This may be expressed in another way: the constituents of the universe interact on one another and are inseparable. Thus, the concept of the individual existence of any single object is based on illusion. This is the first fact.

In “reality” things do not exist in a 3-dimensional state, as the majority including some scientists believe. Rather, things exist in a 4-dimensional state where to the side of space is introduced time, an important element. Continuum is a new unit of measurement in reality: Even space and time are interdependent! This is the second fact.

From these facts one can see straightway that the properties of nature, reality, are definitely beyond our imagination.

In spite of these facts scientists and philosophers are still trying unabatedly to solve the problem of reality with their same old instrument: the power of imagination and reasoning.

It is certain that they will be disappointed. The only success possible to them is the putting of those conceptual properties of reality into mathematical expressions.

Let us consider the source of our knowledge. It can be shown that the knowledge obtained through the process of thinking or reasoning is relative and indirect. One can only think of space and time being independent and not interdependent. Thus one is unable to get rid of one's unreal 3-dimensional universe, that is, one's conflict with the properties of reality.

The writer believes that the 3-dimensional universe is actually the projection or projections of reality, the 4-dimensional state, viewed by different observers from different angles, and is analogous to a 2-dimensional plan or elevation which is a projection of a 3-dimensional building. Scientists and philosophers are only modifying the projections in order to minimize the error and get nearer to the profiles of reality. They are only designing but not constructing the building. It is obvious that no matter however full of details and however accurate their designs may be the building cannot become actual without construction.

It is equally obvious that to a seeker of truth the theories of scientists and philosophers are only helpful to a certain extent but are not at all vital. What is more important to him than all theories of science and philosophy is to construct the building of reality, with material and labour, so that he could live happily in this building and then see every part clearly.

If one should turn one's direction of observation a hundred and eighty degrees, that is, look back at the direct source of knowledge—consciousness—one would find a lot of data of an invaluable kind concerning reality. But the process of introspection is difficult to master. In order to minimize erroneous and false “intuition,” preparatory training, moral and mental, is essential.

Things are cognized in the process of experiencing them. Experience is preserved in the deepest part of our mind. The function of this part of the mind is so fine and subtle that it is

scarcely perceptible to ordinary people. Experience undergoes modification little by little from moment to moment. The principle of causality rules these modifications.

In all experience with oneself, the ego, as centre, and material and spiritual elements taken wrongly as individual objects, as environment, a 3-dimensional universe is suggested.

This false concept produces a centripetal tendency drawing one's attention to the self and individuality. It resembles a free-moving element with initial stress in a structure. Although there is no external stress yet the element itself is always under strain. The initial stress represents the force of kamma. The strain, the illusive life with suffering. Should this centripetal tendency be properly removed, one would readily be in a universe of 4 dimensions.

This is actually the Buddhist way of interpreting reality. It agrees with modern scientific theories and gives light to the truth seeker to attain true knowledge. The Buddha, the Sakyamuni, is the first saint in this world who was able to gain insight into the Truth. He termed the Real Universe, Nibbāna, the 4-dimensional state of reality. Nibbāna, though it has been explained in many ways, is itself beyond the reach of our speculation.

Using the same parable, one finds that the Teaching of the Buddha is a workable or practical design of reality, drawn on a transitory map. The details of moral and mental training have incomparable value. They are of greater importance than the philosophic side of the Teaching.

The Sakyamuni assures that every living being, and above all the human being, has the chance and a sufficiency of material to obtain Nibbāna. The way of attainment is through moral training and psychological reform.

The Principles of the Buddha lead one to the way of right living, the way that is without contradictions of thought, fallacies of reason and suffering of any kind. This very way may be called Genuine Living. By treading that way one truly lives and denies death.

The foregoing paragraphs may be summarized as follows:

1. Things exist in a state of relation to one another and not independently.
2. Things interact on one another and are changing at every instant.
3. 1 and 2 show that the state of reality is 4-dimensional and that its properties are beyond our imagination.
4. Scientific and philosophical theories give us only projections of reality.
5. The direct source of knowledge is experience. Subjective experience with the ego as centre of observation gives us a false conception of reality. The motive force which causes this seemingly irresistible tendency to misunderstand is called kamma in Buddhism.
6. The illusive perception of the universe and especially of a self that is independent causes suffering to every creature. The variation of suffering is governed by the law of cause and effect, and works naturally, as a matter of course. The belief in a God or any supernatural being who governs this world, all anthropomorphizing, is just a phantasm.
7. The way to get rid of kammical disturbance is the "Path to Nibbāna," which consists of moral training: observance of precepts, etc., and psychological training: concentration, meditation, contemplation, etc., as taught in Buddhism.

8. True knowledge, the aim of philosophy, and virtuous conduct, the aim of ethics, are merely two branches of the one tree of reality. Or they may be compared to the two wheels of the chariot that takes a man to Nibbāna.
9. To the truth seeker right knowledge is the microscope, training is the experiment, and the whole universe the perfect laboratory.
10. The teaching of the Buddha furnishes all that a seeker of truth needs to learn and to follow.

Atom and Anattā

Upāsaka Wu Shu (Loo Yung Tsung)

Everybody should agree in saying that science is the leading factor that creates modern civilization. The recent discovery of the release of nuclear energy brings mankind to a new age—the so-called Atomic Age. But unfortunately the first sign that served as an announcement of the opening of this new era was the explosion of a new lethal weapon called the atomic bomb. Men began to worry that they are living in an atomic age where total annihilation of the whole civilized races is actually possible. They generally cannot but think that men are going along the wrong track, and feel that it would be better to give up the deadly energy and enjoy a peaceful though simpler life like their ancestors. But history does not allow events to go backwards. As Mr. Arthur H. Compton, an authoritative American scientist, said, in *One World or None*, “No group of men had the power to prevent the coming of the atomic age.” So the only right thing for men to do is to be aware of the serious position where mankind now stands and adjust their thinking and their mode of living in such a way so that they may make the best possible use of this new force that has been put into their hands. As a matter of fact there is nothing wrong with the bomb; what’s wrong is with man himself. Furthermore, the truth revealed as to the inside nature of the atom has undoubtedly invaluable influence not only upon the field of science itself but upon all other branches of knowledge: psychology, philosophy and even theology. It is the aim of this talk to introduce the important facts and new conceptions disclosed by the scientists of today and to compare these analogically with the fundamental principles of reality unveiled and preached by Sakyamuni, the Buddha, some two thousand five hundred years ago.

In 1808 John Dalton propounded the atomic theory. He believed that an element actually consisted of separate invisible and indivisible atoms. He thought of atoms as things having the properties of a billiard ball. In the later part of that century great scientists like Michael Faraday, James Maxwell and Lord Kelvin began their work in the development of electrical science. The electric nature of an atom was partly disclosed. In 1913 Niels Bohr of Copenhagen produced a theory stating that an atom consisted of two parts, a small heavy nucleus surrounded by a large empty region in which electrons move somewhat like planets about the sun. Around the electrons there are lines of magnetic force; the influence of these lines is theoretically universal. Faraday symbolized an atom as a starfish with a small body and comparatively long limbs which entangle things the limbs contact. This might be put thus: the constituents of the material universe interact with one another and are really inseparable. This concept of the atom has important philosophical significance.

Things do not exist individually. The existence of a single object is therefore nothing more than a mental illusion. The universe is simply a process, a system of interconnected activities in which nothing moves independently of the rest and where all is in ceaseless motion. This

is exactly the same in principle, though different in words, as the Buddha's preaching of "Anicca," which means the impermanent or transient nature of things.

Until the release of nuclear energy men still had a shady belief in the existence of ninety-four elements, whose atoms were visualized to be indestructible. Yet as early as 1905 Scientist Albert Einstein had already foreseen the fact that mass and energy were convertible, and he gave the neat equation: $E = mc^2$, where E = energy, c = the velocity of light, m = mass. It is apparent from the equation that a small piece of matter, if converted entirely into energy, would give an enormous amount of energy. And this equation has been verified to be principally correct by the atomic bombs which exploded over New Mexico, Hiroshima, Nagasaki, and near Bikini Atoll in the Pacific. Thus matter or the atom can be described as a highly concentrated form of energy. The reaction which occurs in an exploding atomic bomb can be expressed in the following:

$U-235 + \text{neutron} = I + Y + N \text{ neutrons}$ (U = uranium, I = iodine, Y = yttrium, N = a number); thus an Uranium atom breaks up and transforms into atoms of Iodine and Yttrium.

The atom, the original meaning of which is "indivisible," had been finally proven to be divisible. But in ordinary chemistry the conventional theory of the atom still holds good for most practical purposes. Paradoxically it might be put in the following way: An atom is not (really) an atom; it is called an atom for the sake of convenience. One might notice the startling resemblance here of science with Buddhism if one ever had read the Diamond Sutta in which it is said: "When the Tathāgata speaks of universes he does not mean really universes; he calls them universes only nominally."

Let us now turn to a field to which scientists pay comparatively little attention, that is, to our mental faculties. Though the psychic functions are much more complicated and subtle than physical phenomena, yet every sentient being has enough instruments, and material of his own, if he only cares to observe and to do his experiment on himself. Our mental or psychic faculties can be divided into two fields: those which function within the field of consciousness, and those beyond the field of consciousness. Different psychologists give different terms and definitions to the latter, some call it sub-consciousness, while others call it unconsciousness, yet they generally agree to mean that part of our psychic activities which is beyond the perception and control of our conscious mind. As to the content of this field of sub-consciousness or unconsciousness, psychologists suggest various terms, such as: primitive inherited impulse and desire, original nature, impulse, drive, urge, instinct, etc. As a matter of fact science in this particular branch is still in its infancy.

It is a strange fact that the field of sub-consciousness, which is in a large part obscure to the men of the atomic age, can be found clearly and repeatedly in various Buddhist writings. In these writings not only is the theory of mind given but also the physical and mental trainings are shown: for getting hold of the seemingly uncontrollable impulses and desires, for uprooting them entirely, and for attaining to the state called Enlightenment where one experiences things as they really are and finally proves the principle of Anatta which means that there is nothing called a personal ego.

It is not possible to mention here with any detail the Buddhist philosophy and training of mind but it might be of interest to you perhaps if I explain briefly the philosophy of the Dharmalakshana school (the consciousness-only or perception-only school). According to the philosophy of this school, the constituents of the universe are divided into eight faculties (or eight consciousnesses). The first five are the five sensual faculties i.e., the faculty to see, to hear, to smell, to taste, and to feel. The sixth faculty is the most active one. It consists of

practically all the mental functions within the field of consciousness. The seventh faculty is the instinctive grasp or attachment of ego. And the eighth one is the most important of all. It is sometimes termed the "reservoir faculty"¹, where the tendencies and energies of all our previous actions and experiences are kept. The seventh and eighth faculties function continuously as the centre of the psychic system no matter whether a man is in the state of awareness or of sleep or is even in the state we commonly call death. When all the above-mentioned six faculties cease to function the force of the seventh faculty or attachment of ego is tremendous; it is like the nuclear binding energy of an atom. It causes the arising of the superficial layer, indifferent forms, in the instinctive desire to live, to propagate, to possess, etc.

As a matter of fact the ego-instinct originates and directs almost all the superficial functions such as volition, emotion, etc., and even affects our system of reasoning. It distorts our conscious mind and hence creates the illusory picture of the individual existence of "I," "Being," "Things," etc., thus overshadowing the real nature of impermanence and egolessness. Since all the faculties of the conscious mind are more or less affected by the blind attachment of the ego, it might be said, figuratively, that the field of subconsciousness is the nucleus in which the ego-attachment is the binding force. The other mental faculties move around it like the electrons revolving round the nucleus of an atom. The arrangement of electrons in the orbits of an atom determines its chemical properties, so do the conscious faculties like volition, emotion, intellect, etc., of a certain individual determine his personality or character.

It is worthwhile to mention especially the intellectual power of a human being. It has the power of reasoning, understanding and generalizing all the events occurring in experience; thus through this faculty men are able to transmit and interchange their ideas and thoughts, just as the electrons in the outermost orbit make possible the flow of electric current. Another important feature of the intellect is that it is the least affected by the influence of the ego-instinct. On the contrary, through reasoning and contemplation it even possesses the power of self-realizing the truth of egolessness. It is actually by means of this delicate faculty that the detachment of the ego, figuratively speaking the breaking of a psychic atom, is possible.

Induced, perhaps, by the newly disclosed scientific ideas and theories, a scientist and philosopher like William James declared that consciousness was only a function, and one like Bertrand Russell said that such a term as "mental" does not belong to a single entity in its own right (that is, the imaginary ego), but only to a system of entities. The revival of egolessness foreshadows the possible recovery of their faith in reality, which is built upon a rational philosophy closely related to modern science.

But to understand the emptiness of the ego is one thing; to practice, to realise and to live an egoless life is quite another. Einstein visualized the probable release of nuclear energy but the actual bomb came into existence some forty years later. There were people like Sakyamuni and his arahat-followers, though with aim quite different from the scientists, who declared their attainment to the state of full enlightenment and annihilation of the ego; yet compared with billions of sentient beings they are just as rare as the self-radiating elements uranium, radium, actinium, and thorium on this earth. It is also interesting to notice that in the Buddhist teaching, everywhere, the principle of the so-called "Middle Path" or "Middle Way" can be seen. This principle essentially teaches one to refrain from going to extremes in both physical and mental practices. And it is believed that this principle effectively leads one to penetration and enlightenment. In the process of penetrating into the

¹ *Ālaya-vijñāna*—a Mahayana concept (Ed.).

nature of an atom, scientists found that an atom consisted of a complex system of negatively charged electrons widely spaced around a positively charged nucleus. Charged particles (such as protons, electrons, or alpha particles) and electromagnetic radiations (such as gamma rays) lose energy and thus slow down in passing through that field. They discovered finally a new particle which they called the neutron, having no electric charge, able to penetrate through the orbits and go its way unchecked until it makes a "head on" collision with an atomic nucleus.

Though atomic science and Buddhism seem to be entirely different yet they are really tackling the same problem of energy and release of energy by breaking highly concentrated form of energy called the atom in one case, and the ego in the other. And their direction is the same, namely, "inward": Therefore we should not be astonished by the close resemblance between the two. The energy released through the breaking of an ego is not so evident as in the atomic bomb yet the Buddha's highest wisdom and infinite compassion are very much like the light and heat released from the natural source of atomic energy of the sun.

Briefly I have mentioned two of the three fundamental principles of Buddhism, namely *anicca* (impermanence) and *anattā* (egolessness). The other important principle is called *dukkha* (suffering) or the consequence of an egoistic life. These three principles are so important that they are actually considered as the testing-stone of Buddhism. Any theory or philosophy which is completely in accordance with these three principles is justified to be called Buddhist; and anything not in accordance with the three is not Buddhist. From this fact the rational character of Buddhism can be easily felt.

Science and the Common Understanding

An Extract

J. Robert Oppenheimer (New York 1954)

"If we ask, for instance, whether the position of the electron remains the same, we must say 'no'; if we ask whether the electron's position changes with time, we must say 'no'; if we ask whether the electron is at rest, we must say 'no'; if we ask whether it is in motion, we must say 'no.' The Buddha has given such answers when interrogated as to the conditions of a man's self after his death; but they are not familiar answers for the tradition of seventeenth and eighteenth century science."

Editor's Note:

The statement of the Buddha mentioned by Oppenheimer, is frequently met with in the Buddhist scriptures, for instance in the following passage from the 72nd discourse of the Majjhima-Nikāya (Middle Length Discourses):

"To think that 'the Perfect One² exists after death'; that 'the Perfect One does not exist after death'; that 'the Perfect One both exists and does not exist after death'; that 'the Perfect One neither exists nor does not exist after death'—these, Vaccha, are the assumptions of speculative views; it is a jungle of views, a wilderness of views, a juggling of views, a writhing of views, a fetter of views; it is coupled with misery, distress, despair and agony; it

² These statements apply not only to the concept of a perfect one (*tathāgata*, i.e. a Buddha) and a saint (*arahat*), but, according to the commentaries, also to the concept of a being (*satta*) in general.

does not conduce to turning away, to dispassion, cessation, quiescence, direct knowledge, awakening, nor to Nibbāna. Perceiving this as a peril, Vaccha, I did not approach any of these speculative views.

“As to the assumption of theories, Vaccha, the Perfect One has discarded it. But this has been seen by the Perfect One: ‘Such is corporeality, such is the arising of corporeality, such is the disappearing of corporeality; such is feeling ...such is perception... such are mental formations... such is consciousness, such is the arising of consciousness, such is the disappearing of consciousness.’ Therefore I say that the Perfect One is free without clinging from all imaginings, all confusions, all assertive tendencies concerning ‘I’ and ‘mine.’”

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