

Albert Einstein

On Religion and Science

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1930-1948

Religion and Science

In this file:

Religion and Science, *New York Times Magazine*, November 9, 1930

Science and Religion I, Address: Princeton Theological Seminary, May 19, 1939

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Religion and Science

*The following article by Albert Einstein appeared in the **New York Times Magazine** on November 9, 1930 pp 1-4. It has been reprinted in **Ideas and Opinions**, Crown Publishers, Inc. 1954, pp 36 - 40. It also appears in Einstein's book **The World as I See It**, Philosophical Library, New York, 1949, pp. 24 - 28.*

Everything that the human race has done and thought is concerned with the satisfaction of deeply felt needs and the assuagement of pain. One has to keep this constantly in mind if one wishes to understand spiritual movements and their development. Feeling and longing are the motive force behind all human endeavor and human creation, in however exalted a guise the latter may present themselves to us. Now what are the feelings and needs that have led men to religious thought and belief in the widest sense of the words? A little consideration will suffice to show us that the most varying

emotions preside over the birth of religious thought and experience. With primitive man it is above all fear that evokes religious notions - fear of hunger, wild beasts, sickness, death. Since at this stage of existence understanding of causal connections is usually poorly developed, the human mind creates illusory beings more or less analogous to itself on whose wills and actions these fearful happenings depend. Thus one tries to secure the favor of these beings by carrying out actions and offering sacrifices which, according to the tradition handed down from generation to generation, propitiate them or make them well disposed toward a mortal. In this sense I am speaking of a religion of fear. This, though not created, is in an important degree stabilized by the formation of a special priestly caste which sets itself up as a mediator between the people and the beings they fear, and erects a hegemony on this basis. In many cases a leader or ruler or a privileged class whose position rests on other factors combines priestly functions with its secular authority in

order to make the latter more secure; or the political rulers and the priestly caste make common cause in their own interests.

The social impulses are another source of the crystallization of religion. Fathers and mothers and the leaders of larger human communities are mortal and fallible. The desire for guidance, love, and support prompts men to form the social or moral conception of God. This is the God of Providence, who protects, disposes, rewards, and punishes; the God who, according to the limits of the believer's outlook, loves and cherishes the life of the tribe or of the human race, or even of life itself; the comforter in sorrow and unsatisfied longing; he who preserves the souls of the dead. This is the social or moral conception of God.

The Jewish scriptures admirably illustrate the development from the religion of fear to moral religion, a development continued in the New Testament. The religions of all civilized peoples, especially the peoples of the Orient, are primarily moral religions. The development from a religion of fear to moral religion is a

great step in peoples' lives. And yet, that primitive religions are based entirely on fear and the religions of civilized peoples purely on morality is a prejudice against which we must be on our guard. The truth is that all religions are a varying blend of both types, with this differentiation: that on the higher levels of social life the religion of morality predominates.

Common to all these types is the anthropomorphic character of their conception of God. In general, only individuals of exceptional endowments, and exceptionally high-minded communities, rise to any considerable extent above this level. But there is a third stage of religious experience which belongs to all of them, even though it is rarely found in a pure form: I shall call it cosmic religious feeling. It is very difficult to elucidate this feeling to anyone who is entirely without it, especially as there is no anthropomorphic conception of God corresponding to it.

The individual feels the futility of human desires and aims and the sublimity and marvelous order which reveal themselves both

in nature and in the world of thought. Individual existence impresses him as a sort of prison and he wants to experience the universe as a single significant whole. The beginnings of cosmic religious feeling already appear at an early stage of development, e.g., in many of the Psalms of David and in some of the Prophets. Buddhism, as we have learned especially from the wonderful writings of Schopenhauer, contains a much stronger element of this.

The religious geniuses of all ages have been distinguished by this kind of religious feeling, which knows no dogma and no God conceived in man's image; so that there can be no church whose central teachings are based on it. Hence it is precisely among the heretics of every age that we find men who were filled with this highest kind of religious feeling and were in many cases regarded by their contemporaries as atheists, sometimes also as saints. Looked at in this light, men like Democritus, Francis of Assisi, and Spinoza are closely akin to one another.

How can cosmic religious feeling be communicated from one person to another, if it can give rise to no definite notion of a God and no theology? In my view, it is the most important function of art and science to awaken this feeling and keep it alive in those who are receptive to it.

We thus arrive at a conception of the relation of science to religion very different from the usual one. When one views the matter historically, one is inclined to look upon science and religion as irreconcilable antagonists, and for a very obvious reason. The man who is thoroughly convinced of the universal operation of the law of causation cannot for a moment entertain the idea of a being who interferes in the course of events - provided, of course, that he takes the hypothesis of causality really seriously. He has no use for the religion of fear and equally little for social or moral religion. A God who rewards and punishes is inconceivable to him for the simple reason that a man's actions are determined by necessity, external and internal, so that in

God's eyes he cannot be responsible, any more than an inanimate object is responsible for the motions it undergoes. Science has therefore been charged with undermining morality, but the charge is unjust. A man's ethical behavior should be based effectually on sympathy, education, and social ties and needs; no religious basis is necessary. Man would indeed be in a poor way if he had to be restrained by fear of punishment and hopes of reward after death.

It is therefore easy to see why the churches have always fought science and persecuted its devotees. On the other hand, I maintain that the cosmic religious feeling is the strongest and noblest motive for scientific research. Only those who realize the immense efforts and, above all, the devotion without which pioneer work in theoretical science cannot be achieved are able to grasp the strength of the emotion out of which alone such work, remote as it is from the immediate realities of life, can issue. What a deep conviction of the rationality of the universe and what a yearning to understand,

were it but a feeble reflection of the mind revealed in this world, Kepler and Newton must have had to enable them to spend years of solitary labor in disentangling the principles of celestial mechanics! Those whose acquaintance with scientific research is derived chiefly from its practical results easily develop a completely false notion of the mentality of the men who, surrounded by a skeptical world, have shown the way to kindred spirits scattered wide through the world and through the centuries. Only one who has devoted his life to similar ends can have a vivid realization of what has inspired these men and given them the strength to remain true to their purpose in spite of countless failures. It is cosmic religious feeling that gives a man such strength. A contemporary has said, not unjustly, that in this materialistic age of ours the serious scientific workers are the only profoundly religious people.

Science and Religion

This article appears in Einstein's Ideas and Opinions, pp.41 - 49. The first section is taken from an address at Princeton Theological Seminary, May 19, 1939. It was published in Out of My Later Years, New York: Philosophical Library, 1950. The second section is from Science, Philosophy and Religion, A Symposium, published by the Conference on Science, Philosophy and Religion in Their Relation to the Democratic Way of Life, Inc., New York, 1941.

1.

During the last century, and part of the one before, it was widely held that there was an unreconcilable conflict between knowledge and belief. The opinion prevailed among advanced minds that it was time that belief should be replaced increasingly by knowledge; belief that did not itself rest on knowledge was superstition, and as such had to be opposed. According to this conception, the sole function of education was to open the way to thinking and knowing, and the school, as the outstanding organ for the people's education, must serve that end exclusively.

One will probably find but rarely, if at all, the rationalistic standpoint expressed in such crass form; for any sensible man would see at once how one-sided is such a statement of the position. But it is just as well to state a thesis starkly and nakedly, if one wants to clear up one's mind as to its nature.

It is true that convictions can best be supported with experience and clear thinking.

On this point one must agree unreservedly with the extreme rationalist. The weak point of his conception is, however, this, that those convictions which are necessary and determinant for our conduct and judgments cannot be found solely along this solid scientific way.

For the scientific method can teach us nothing else beyond how facts are related to, and conditioned by, each other. The aspiration toward such objective knowledge belongs to the highest of which man is capable, and you will certainly not suspect me of wishing to belittle the achievements and the heroic efforts of man in this sphere. Yet it is equally clear that knowledge of what is does not open the door directly to what should be. One can have the clearest and most complete knowledge of what is, and yet not be able to deduct from that what should be the goal of our human aspirations. Objective knowledge provides us with powerful instruments for the achievements of certain ends, but the ultimate goal itself and the longing to reach it must

come from another source. And it is hardly necessary to argue for the view that our existence and our activity acquire meaning only by the setting up of such a goal and of corresponding values. The knowledge of truth as such is wonderful, but it is so little capable of acting as a guide that it cannot prove even the justification and the value of the aspiration toward that very knowledge of truth. Here we face, therefore, the limits of the purely rational conception of our existence.

But it must not be assumed that intelligent thinking can play no part in the formation of the goal and of ethical judgments. When someone realizes that for the achievement of an end certain means would be useful, the means itself becomes thereby an end. Intelligence makes clear to us the interrelation of means and ends. But mere thinking cannot give us a sense of the ultimate and fundamental ends. To make clear these fundamental ends and valuations, and to set them fast in the emotional life of the individual, seems to me precisely the most important

function which religion has to perform in the social life of man. And if one asks whence derives the authority of such fundamental ends, since they cannot be stated and justified merely by reason, one can only answer: they exist in a healthy society as powerful traditions, which act upon the conduct and aspirations and judgments of the individuals; they are there, that is, as something living, without its being necessary to find justification for their existence. They come into being not through demonstration but through revelation, through the medium of powerful personalities. One must not attempt to justify them, but rather to sense their nature simply and clearly.

The highest principles for our aspirations and judgments are given to us in the Jewish-Christian religious tradition. It is a very high goal which, with our weak powers, we can reach only very inadequately, but which gives a sure foundation to our aspirations and valuations. If one were to take that goal out of its religious form and look merely at its purely human side, one might state it perhaps thus:

free and responsible development of the individual, so that he may place his powers freely and gladly in the service of all mankind.

There is no room in this for the divinization of a nation, of a class, let alone of an individual. Are we not all children of one father, as it is said in religious language? Indeed, even the divinization of humanity, as an abstract totality, would not be in the spirit of that ideal. It is only to the individual that a soul is given. And the high destiny of the individual is to serve rather than to rule, or to impose himself in any other way.

If one looks at the substance rather than at the form, then one can take these words as expressing also the fundamental democratic position. The true democrat can worship his nation as little as can the man who is religious, in our sense of the term.

What, then, in all this, is the function of education and of the school? They should help the young person to grow up in such a spirit that these fundamental principles should be to

him as the air which he breathes. Teaching alone cannot do that.

If one holds these high principles clearly before one's eyes, and compares them with the life and spirit of our times, then it appears glaringly that civilized mankind finds itself at present in grave danger, In the totalitarian states it is the rulers themselves who strive actually to destroy that spirit of humanity. In less threatened parts it is nationalism and intolerance, as well as the oppression of the individuals by economic means, which threaten to choke these most precious traditions.

A realization of how great is the danger is spreading, however, among thinking people, and there is much search for means with which to meet the danger--means in the field of national and international politics, of legislation, or organization in general. Such efforts are, no doubt, greatly needed. Yet the ancients knew something- which we seem to have forgotten. All means prove but a blunt instrument, if they have not behind them a living spirit. But if the longing for the

achievement of the goal is powerfully alive within us, then shall we not lack the strength to find the means for reaching the goal and for translating it into deeds.

It would not be difficult to come to an agreement as to what we understand by science. Science is the century-old endeavor to bring together by means of systematic thought the perceptible phenomena of this world into as thoroughgoing an association as possible. To put it boldly, it is the attempt at the posterior reconstruction of existence by the process of conceptualization. But when asking myself what religion is I cannot think of the answer so easily. And even after finding an answer which may satisfy me at this particular moment, I still remain convinced that I can never under any circumstances bring together, even to a slight extent, the thoughts of all those who have given this question serious consideration.

At first, then, instead of asking what religion is I should prefer to ask what characterizes the aspirations of a person who gives me the impression of being religious: a person who is religiously enlightened appears to me to be one who has, to the best of his ability, liberated

himself from the fetters of his selfish desires and is preoccupied with thoughts, feelings, and aspirations to which he clings because of their superpersonal value. It seems to me that what is important is the force of this superpersonal content and the depth of the conviction concerning its overpowering meaningfulness, regardless of whether any attempt is made to unite this content with a divine Being, for otherwise it would not be possible to count Buddha and Spinoza as religious personalities. Accordingly, a religious person is devout in the sense that he has no doubt of the significance and loftiness of those superpersonal objects and goals which neither require nor are capable of rational foundation. They exist with the same necessity and matter-of-factness as he himself. In this sense religion is the age-old endeavor of mankind to become clearly and completely conscious of these values and goals and constantly to strengthen and extend their effect. If one conceives of religion and science according to these definitions then a conflict between them appears impossible. For science

can only ascertain what is, but not what should be, and outside of its domain value judgments of all kinds remain necessary. Religion, on the other hand, deals only with evaluations of human thought and action: it cannot justifiably speak of facts and relationships between facts. According to this interpretation the well-known conflicts between religion and science in the past must all be ascribed to a misapprehension of the situation which has been described.

For example, a conflict arises when a religious community insists on the absolute truthfulness of all statements recorded in the Bible. This means an intervention on the part of religion into the sphere of science; this is where the struggle of the Church against the doctrines of Galileo and Darwin belongs. On the other hand, representatives of science have often made an attempt to arrive at fundamental judgments with respect to values and ends on the basis of scientific method, and in this way have set themselves in opposition to religion. These conflicts have all sprung from fatal errors.

Now, even though the realms of religion and science in themselves are clearly marked off from each other, nevertheless there exist between the two strong reciprocal relationships and dependencies. Though religion may be that which determines the goal, it has, nevertheless, learned from science, in the broadest sense, what means will contribute to the attainment of the goals it has set up. But science can only be created by those who are thoroughly imbued with the aspiration toward truth and understanding. This source of feeling, however, springs from the sphere of religion. To this there also belongs the faith in the possibility that the regulations valid for the world of existence are rational, that is, comprehensible to reason. I cannot conceive of a genuine scientist without that profound faith. The situation may be expressed by an image: science without religion is lame, religion without science is blind.

Though I have asserted above that in truth a legitimate conflict between religion and science cannot exist, I must nevertheless qualify this

assertion once again on an essential point, with reference to the actual content of historical religions. This qualification has to do with the concept of God. During the youthful period of mankind's spiritual evolution human fantasy created gods in man's own image, who, by the operations of their will were supposed to determine, or at any rate to influence, the phenomenal world. Man sought to alter the disposition of these gods in his own favor by means of magic and prayer. The idea of God in the religions taught at present is a sublimation of that old concept of the gods. Its anthropomorphic character is shown, for instance, by the fact that men appeal to the Divine Being in prayers and plead for the fulfillment of their wishes.

Nobody, certainly, will deny that the idea of the existence of an omnipotent, just, and omnibeneficent personal God is able to accord man solace, help, and guidance; also, by virtue of its simplicity it is accessible to the most undeveloped mind. But, on the other hand, there are decisive weaknesses attached to this

idea in itself, which have been painfully felt since the beginning of history. That is, if this being is omnipotent, then every occurrence, including every human action, every human thought, and every human feeling and aspiration is also His work; how is it possible to think of holding men responsible for their deeds and thoughts before such an almighty Being? In giving out punishment and rewards He would to a certain extent be passing judgment on Himself. How can this be combined with the goodness and righteousness ascribed to Him?

The main source of the present-day conflicts between the spheres of religion and of science lies in this concept of a personal God. It is the aim of science to establish general rules which determine the reciprocal connection of objects and events in time and space. For these rules, or laws of nature, absolutely general validity is required--not proven. It is mainly a program, and faith in the possibility of its accomplishment in principle is only founded on partial successes. But hardly anyone could be

found who would deny these partial successes and ascribe them to human self-deception. The fact that on the basis of such laws we are able to predict the temporal behavior of phenomena in certain domains with great precision and certainty is deeply embedded in the consciousness of the modern man, even though he may have grasped very little of the contents of those laws. He need only consider that planetary courses within the solar system may be calculated in advance with great exactitude on the basis of a limited number of simple laws. In a similar way, though not with the same precision, it is possible to calculate in advance the mode of operation of an electric motor, a transmission system, or of a wireless apparatus, even when dealing with a novel development.

To be sure, when the number of factors coming into play in a phenomenological complex is too large, scientific method in most cases fails us. One need only think of the weather, in which case prediction even for a few days ahead is impossible. Nevertheless no

one doubts that we are confronted with a causal connection whose causal components are in the main known to us. Occurrences in this domain are beyond the reach of exact prediction because of the variety of factors in operation, not because of any lack of order in nature.

We have penetrated far less deeply into the regularities obtaining within the realm of living things, but deeply enough nevertheless to sense at least the rule of fixed necessity. One need only think of the systematic order in heredity, and in the effect of poisons, as for instance alcohol, on the behavior of organic beings. What is still lacking here is a grasp of connections of profound generality, but not a knowledge of order in itself.

The more a man is imbued with the ordered regularity of all events the firmer becomes his conviction that there is no room left by the side of this ordered regularity for causes of a different nature. For him neither the rule of human nor the rule of divine will exists as an independent cause of natural events. To be

sure, the doctrine of a personal God interfering with natural events could never be refuted, in the real sense, by science, for this doctrine can always take refuge in those domains in which scientific knowledge has not yet been able to set foot.

But I am persuaded that such behavior on the part of the representatives of religion would not only be unworthy but also fatal. For a doctrine which is able to maintain itself not in clear light but only in the dark, will of necessity lose its effect on mankind, with incalculable harm to human progress. In their struggle for the ethical good, teachers of religion must have the stature to give up the doctrine of a personal God, that is, give up that source of fear and hope which in the past placed such vast power in the hands of priests. In their labors they will have to avail themselves of those forces which are capable of cultivating the Good, the True, and the Beautiful in humanity itself. This is, to be sure, a more difficult but an incomparably more worthy task. (This thought is convincingly presented in

Herbert Samuel's book, *Belief and Action*.) After religious teachers accomplish the refining process indicated they will surely recognize with joy that true religion has been ennobled and made more profound by scientific knowledge.

If it is one of the goals of religion to liberate mankind as far as possible from the bondage of egocentric cravings, desires, and fears, scientific reasoning can aid religion in yet another sense. Although it is true that it is the goal of science to discover rules which permit the association and foretelling of facts, this is not its only aim. It also seeks to reduce the connections discovered to the smallest possible number of mutually independent conceptual elements. It is in this striving after the rational unification of the manifold that it encounters its greatest successes, even though it is precisely this attempt which causes it to run the greatest risk of falling a prey to illusions. But whoever has undergone the intense experience of successful advances made in this domain is moved by profound reverence for the

rationality made manifest in existence. By way of the understanding he achieves a far-reaching emancipation from the shackles of personal hopes and desires, and thereby attains that humble attitude of mind toward the grandeur of reason incarnate in existence, and which, in its profoundest depths, is inaccessible to man. This attitude, however, appears to me to be religious, in the highest sense of the word. And so it seems to me that science not only purifies the religious impulse of the dross of its anthropomorphism but also contributes to a religious spiritualization of our understanding of life.

The further the spiritual evolution of mankind advances, the more certain it seems to me that the path to genuine religiosity does not lie through the fear of life, and the fear of death, and blind faith, but through striving after rational knowledge. In this sense I believe that the priest must become a teacher if he wishes to do justice to his lofty educational mission.

Religion and Science: Irreconcilable?

A response to a greeting sent by the Liberal Ministers' Club of New York City. Published in The Christian Register, June, 1948. Published in Ideas and Opinions, Crown Publishers, Inc., New York, 1954.

Does there truly exist an insuperable contradiction between religion and science? Can religion be superseded by science? The answers to these questions have, for centuries, given rise to considerable dispute and, indeed, bitter fighting. Yet, in my own mind there can be no doubt that in both cases a dispassionate consideration can only lead to a negative answer. What complicates the solution, however, is the fact that while most people readily agree on what is meant by "science," they are likely to differ on the meaning of "religion."

As to science, we may well define it for our purpose as "methodical thinking directed toward finding regulative connections between our sensual experiences." Science, in the

immediate, produces knowledge and, indirectly, means of action. It leads to methodical action if definite goals are set up in advance. For the function of setting up goals and passing statements of value transcends its domain. While it is true that science, to the extent of its grasp of causative connections, may reach important conclusions as to the compatibility and incompatibility of goals and evaluations, the independent and fundamental definitions regarding goals and values remain beyond science's reach.

As regards religion, on the other hand, one is generally agreed that it deals with goals and evaluations and, in general, with the emotional foundation of human thinking and acting, as far as these are not predetermined by the inalterable hereditary disposition of the human species. Religion is concerned with man's attitude toward nature at large, with the establishing of ideals for the individual and communal life, and with mutual human relationship. These ideals religion attempts to attain by exerting an educational influence on

tradition and through the development and promulgation of certain easily accessible thoughts and narratives (epics and myths) which are apt to influence evaluation and action along the lines of the accepted ideals.

It is this mythical, or rather this symbolic, content of the religious traditions which is likely to come into conflict with science. This occurs whenever this religious stock of ideas contains dogmatically fixed statements on subjects which belong in the domain of science. Thus, it is of vital importance for the preservation of true religion that such conflicts be avoided when they arise from subjects which, in fact, are not really essential for the pursuance of the religious aims.

When we consider the various existing religions as to their essential substance, that is, divested of their myths, they do not seem to me to differ as basically from each other as the proponents of the "relativistic" or conventional theory wish us to believe. And this is by no means surprising. For the moral attitudes of a people that is supported by religion need

always aim at preserving and promoting the sanity and vitality of the community and its individuals, since otherwise this community is bound to perish. A people that were to honor falsehood, defamation, fraud, and murder would be unable, indeed, to subsist for very long.

When confronted with a specific case, however, it is no easy task to determine clearly what is desirable and what should be eschewed, just as we find it difficult to decide what exactly it is that makes good painting or good music. It is something that may be felt intuitively more easily than rationally comprehended. Likewise, the great moral teachers of humanity were, in a way, artistic geniuses in the art of living. In addition to the most elementary precepts directly motivated by the preservation of life and the sparing of unnecessary suffering, there are others to which, although they are apparently not quite commensurable to the basic precepts, we nevertheless attach considerable importance. Should truth, for instance, be sought

unconditionally even where its attainment and its accessibility to all would entail heavy sacrifices in toil and happiness? There are many such questions which, from a rational vantage point, cannot easily be answered or cannot be answered at all. Yet, I do not think that the so-called "relativistic" viewpoint is correct, not even when dealing with the more subtle moral decisions.

When considering the actual living conditions of presentday civilized humanity from the standpoint of even the most elementary religious commands, one is bound to experience a feeling of deep and painful disappointment at what one sees. For while religion prescribes brotherly love in the relations among the individuals and groups, the actual spectacle more resembles a battlefield than an orchestra. Everywhere, in economic as well as in political life, the guiding principle is one of ruthless striving for success at the expense of one's fellow. men. This competitive spirit prevails even in school and, destroying all feelings of human fraternity and cooperation,

conceives of achievement not as derived from the love for productive and thoughtful work, but as springing from personal ambition and fear of rejection.

There are pessimists who hold that such a state of affairs is necessarily inherent in human nature; it is those who propound such views that are the enemies of true religion, for they imply thereby that religious teachings are utopian ideals and unsuited to afford guidance in human affairs. The study of the social patterns in certain so-called primitive cultures, however, seems to have made it sufficiently evident that such a defeatist view is wholly unwarranted. Whoever is concerned with this problem, a crucial one in the study of religion as such, is advised to read the description of the Pueblo Indians in Ruth Benedict's book, *Patterns of Culture*. Under the hardest living conditions, this tribe has apparently accomplished the difficult task of delivering its people from the scourge of competitive spirit and of fostering in it a temperate, cooperative

conduct of life, free of external pressure and without any curtailment of happiness.

The interpretation of religion, as here advanced, implies a dependence of science on the religious attitude, a relation which, in our predominantly materialistic age, is only too easily overlooked. While it is true that scientific results are entirely independent from religious or moral considerations, those individuals to whom we owe the great creative achievements of science were all of them imbued with the truly religious conviction that this universe of ours is something perfect and susceptible to the rational striving for knowledge. If this conviction had not been a strongly emotional one and if those searching for knowledge had not been inspired by Spinoza's *Amor Dei Intellectualis*, they would hardly have been capable of that untiring devotion which alone enables man to attain his greatest achievements.

*The following excerpts are taken from **Albert Einstein: The Human Side.***

Einstein on Prayer

A child in the sixth grade in a Sunday School in New York City, with the encouragement of her teacher, wrote to Einstein in Princeton on 19 January 1936 asking him whether scientists pray, and if so what they pray for. Einstein replied as follows on 24 January 1936:

I have tried to respond to your question as simply as I could. Here is my answer.

Scientific research is based on the idea that everything that takes place is determined by laws of nature, and therefore this holds for the actions of people. For this reason, a research scientist will hardly be inclined to believe that events could be influenced by a prayer, i.e. by a wish addressed to a supernatural Being.

However, it must be admitted that our actual knowledge of these laws is only imperfect and fragmentary, so that, actually, the belief in the

existence of basic all-embracing laws in Nature also rests on a sort of faith. All the same this faith has been largely justified so far by the success of scientific research.

But, on the other hand, every one who is seriously involved in the pursuit of science becomes convinced that a spirit is manifest in the laws of the Universe -- a spirit vastly superior to that of man, and one in the face of which we with our modest powers must feel humble. In this way the pursuit of science leads to a religious feeling of a special sort, which is indeed quite different from the religiosity of someone more naive.

It is worth mentioning that this letter was written a decade after the advent of Heisenberg's principle of indeterminacy and the probabilistic interpretation of quantum mechanics with its denial of strict determinism.

Einstein on Purpose in Nature

In 1954 or 1955 Einstein received a letter citing a statement of his and a seemingly contradictory statement by a noted evolutionist concerning the place of intelligence in the Universe. Here is a translation of the German draft of a reply. It is not known whether a reply was actually sent:

The misunderstanding here is due to a faulty translation of a German text, in particular the use of the word "mystical." I have never imputed to Nature a purpose or a goal, or anything that could be understood as anthropomorphic.

What I see in Nature is a magnificent structure that we can comprehend only very imperfectly, and that must fill a thinking person with a feeling of "humility." This is a genuinely religious feeling that has nothing to do with mysticism.

Einstein on the Meaning of Life

The next excerpt is a letter written by Einstein in response to a 19-year-old Rutgers University student, who had written to Einstein of his despair at seeing no visible purpose to life and no help from religion.

In responding to this poignant cry for help, Einstein offered no easy solace, and this very fact must have heartened the student and lightened the lonely burden of his doubts. Here is Einstein's response. It was written in English and sent from Princeton on 3 December 1950, within days of receiving the letter:

I was impressed by the earnestness of your struggle to find a purpose for the life of the individual and of mankind as a whole. In my opinion there can be no reasonable answer if the question is put this way. If we speak of the purpose and goal of an action we mean simply the question: which kind of desire should we fulfill by the action or its consequences or which undesired consequences should be prevented? We can, of course, also speak in a

clear way of the goal of an action from the standpoint of a community to which the individual belongs. In such cases the goal of the action has also to do at least indirectly with fulfillment of desires of the individuals which constitute a society.

If you ask for the purpose or goal of society as a whole or of an individual taken as a whole the question loses its meaning. This is, of course, even more so if you ask the purpose or meaning of nature in general. For in those cases it seems quite arbitrary if not unreasonable to assume somebody whose desires are connected with the happenings.

Nevertheless we all feel that it is indeed very reasonable and important to ask ourselves how we should try to conduct our lives. The answer is, in my opinion: satisfaction of the desires and needs of all, as far as this can be achieved, and achievement of harmony and beauty in the human relationships. This presupposes a good deal of conscious thought and of self-education. It is undeniable that the enlightened Greeks and the old Oriental sages had

achieved a higher level in this all-important field than what is alive in our schools and universities.

Einstein on the Soul

On 17 July 1953 a woman who was a licensed Baptist pastor sent Einstein in Princeton a warmly appreciative evangelical letter. Quoting several passages from the scriptures, she asked him whether he had considered the relationship of his immortal soul to its Creator, and asked whether he felt assurance of everlasting life with God after death. It is not known whether a reply was sent, but the letter is in the Einstein Archives, and on it, in Einstein's hand writing, is the following sentence, written in English:

I do not believe in immortality of the individual, and I consider ethics to be an exclusively human concern with no superhuman authority behind it.

In Berlin in February 1921 Einstein received from a woman in Vienna a letter imploring him to tell her if he had formed an opinion as to whether the soul exists and with it personal, individual development after death. There were other questions of a similar sort. On 5 February

1921 Einstein answered at some length. Here in part is what he said:

The mystical trend of our time, which shows itself particularly in the rampant growth of the so-called Theosophy and Spiritualism, is for me no more than a symptom of weakness and confusion.

Since our inner experiences consist of reproductions and combinations of sensory impressions, the concept of a soul without a body seems to me to be empty and devoid of meaning.

Einstein on a Personal God

On 22 March 1954 a self-made man sent Einstein in Princeton a long handwritten letter-four closely packed pages in English. The correspondent despaired that there were so few people like Einstein who had the courage to speak out, and he wondered if it would not be best to return the world to the animals. Saying "I presume you would like to know who I am," he went on to tell in detail how he had come from Italy to the United States at the age of nine, arriving in bitter cold weather, as a result of which his sisters died while he barely survived; how after six months of schooling he went to work at age ten; how at age seventeen he went to Evening School; and so on, so that now he had a regular job as an experimental machinist, had a spare-time business of his own, and had some patents to his credit. He declared himself an atheist. He said that real education came from reading books. He cited an article about Einstein's religious beliefs and expressed doubts as to the article's accuracy. He was irreverent about various aspects of

formal religion, speaking about the millions of people who prayed to God in many languages, and remarking that God must have an enormous clerical staff to keep track of all their sins. And he ended with a long discussion of the social and political systems of Italy and the United States that it would take too long to describe here. He also enclosed a check for Einstein to give to charity.

On 24 March 1954 Einstein answered in English as follows:

I get hundreds and hundreds of letters but seldom one so interesting as yours. I believe that your opinions about our society are quite reasonable.

It was, of course, a lie what you read about my religious convictions, a lie which is being systematically repeated. I do not believe in a personal God and I have never denied this but have expressed it clearly. If something is in me which can be called religious then it is the unbounded admiration for the structure of the world so far as our science can reveal it.

I have no possibility to bring the money you sent me to the appropriate receiver. I return it therefore in recognition of your good heart and intention. Your letter shows me also that wisdom is not a product of schooling but of the lifelong attempt to acquire it.

There is in the Einstein Archives a letter dated 5 August 1927 from a banker in Colorado to Einstein in Berlin. Since it begins "Several months ago I wrote you as follows," one may assume that Einstein had not yet answered. The banker remarked that most scientists and the like had given up the idea of God as a bearded, benevolent father figure surrounded by angels, although many sincere people worship and revere such a God. The question of God had arisen in the course of a discussion in a literary group, and some of the members decided to ask eminent men to send their views in a form that would be suitable for publication. He added that some twenty-four Nobel Prize winners had already responded, and he hoped that Einstein would too. On the

letter, Einstein wrote the following in German. It may or may not have been sent:

I cannot conceive of a personal God who would directly influence the actions of individuals, or would directly sit in judgment on creatures of his own creation. I cannot do this in spite of the fact that mechanistic causality has, to a certain extent, been placed in doubt by modern science.

My religiosity consists in a humble admiration of the infinitely superior spirit that reveals itself in the little that we, with our weak and transitory understanding, can comprehend of reality. Morality is of the highest importance- but for us, not for God.

A Chicago Rabbi, preparing a lecture on "The Religious Implications of the Theory of Relativity," wrote to Einstein in Princeton on 20 December 1939 to ask some questions on the topic. Einstein replied as follows:

I do not believe that the basic ideas of the theory of relativity can lay claim to a relationship with the religious sphere that is

different from that of scientific knowledge in general. I see this connection in the fact that profound interrelationships in the objective world can Ije comprehended through simple logical concepts. To be sure, in the theory of relativity this is the case in particularly full measure.

The religious feeling engendered by experiencing the logical comprehensibility of profound interrelations is of a somewhat different sort from the feeling that one usually calls religious. It is more a feeling of awe at the scheme that is manifested in the material universe. It does not lead us to take the step of fashioning a god-like being in our own image—a personage who makes demands of us and who takes an interest in us as individuals. There is in this neither a will nor a goal, nor a must, but only sheer being. For this reason, people of our type see in morality a purely human matter, albeit the most important in the human sphere.

Conversation on Religion and Antisemitism

*From **The Private Albert Einstein** by Peter A. Bucky with Allen G. Weakland, Andrews and McMeel, Kansas City, 1992, pp 85-87. This book contains the record of various conversations between Bucky and Einstein over a thirty year period.*

BUCKY:

It's ironic that your name has been synonymous with science in the twentieth century, and yet there has always been a lot of controversy surrounding you in relation to religious questions. How do you account for this unusual circumstance, since science and religion are usually thought to be at odds?

EINSTEIN:

Well, I do not think that it is necessarily the case that science and religion are natural opposites. In fact, I think that there is a very close connection between the two. Further, I

think that science without religion is lame and, conversely, that religion without science is blind. Both are important and should work hand-in-hand. It seems to me that whoever doesn't wonder about the truth in religion and in science might as well be dead.

BUCKY:

So then, you consider yourself to be a religious man?

EINSTEIN:

I believe in mystery and, frankly, I sometimes face this mystery with great fear. In other words, I think that there are many things in the universe that we cannot perceive or penetrate and that also we experience some of the most beautiful things in life in only a very primitive form. Only in relation to these mysteries do I consider myself to be a religious man. But I sense these things deeply. What I cannot understand is how there could possibly be a God who would reward or punish his subjects or who could induce us to develop our will in our daily life.

BUCKY:

You don't believe in God, then?

EINSTEIN:

Ah, this is what I mean about religion and science going hand-in-hand! Each has a place, but each must be relegated to its sphere. Let's assume that we are dealing with a theoretical physicist or scientist who is very well-acquainted with the different laws of the universe, such as how the planets orbit the sun and how the satellites in turn orbit around their respective planets. Now, this man who has studied and understands these different laws—how could he possibly believe in one God who would be capable of disturbing the paths of these great orbiting masses?

No, the natural laws of science have not only been worked out theoretically but have been proven also in practice. I cannot then believe in this concept of an anthropomorphic God who has the powers of interfering with these natural laws. As I said before, the most beautiful and most profound religious emotion

that we can experience is the sensation of the mystical. And this mysticality is the power of all true science. If there is any such concept as a God, it is a subtle spirit, not an image of a man that so many have fixed in their minds. In essence, my religion consists of a humble admiration for this illimitable superior spirit that reveals itself in the slight details that we are able to perceive with our frail and feeble minds .

BUCKY:

Do you think perhaps that most people need religion to keep them in check, so to speak?

EINSTEIN:

No, clearly not. I do not believe that a man should be restrained in his daily actions by being afraid of punishment after death or that he should do things only because in this way he will be rewarded after he dies. This does not make sense. The proper guidance during the life of a man should be the weight that he puts upon ethics and the amount of consideration that he has for others. Education has a

great role to play in this respect. Religion should have nothing to do with a fear of living or a fear of death, but should instead be a striving after rational knowledge.

BUCKY:

And yet, with all of these thoughts, you are still identified strongly in the public mind as definitely Jewish and this certainly is a very traditional religion.

EINSTEIN:

Actually, my first religious training of any kind was in the Catholic catechism. A fluke, of course, only because the primary school that I first went to was a Catholic one. I was, as a matter of fact, the only Jewish child in the school. This actually worked to my advantage, since it made it easier for me to isolate myself from the rest of the class and find that comfort in solitude that I so cherished.

BUCKY:

But don't you find any discrepancy between your previous somewhat anti-religious

statements and your willingness to be identified publicly as a Jew?

EINSTEIN:

Not necessarily. Actually it is a very difficult thing to even define a Jew. The closest that I can come to describing it is to ask you to visualize a snail. A snail that you see at the ocean consists of the body that is snuggled inside of the house which it always carries around with it. But let's picture what would happen if we lifted the shell off of the snail. Would we not still describe the unprotected body as a snail? In just the same way, a Jew who sheds his faith along the way, or who even picks up a different one, is still a Jew.

BUCKY:

You were the focus of much attack on the part of the Nazis in Germany because of your Jewishness. What explanation have you come up with for why the Jews have been hated so much throughout history?

EINSTEIN:

It seems obvious to me that Jews make an ideal scapegoat for any country experiencing social, economic, or political difficulties. The reason for this is twofold. First of all, there is hardly a country in the world that does not have a Jewish segment in the population. And secondly, wherever Jews reside, they are a minority of the population, and a small minority at that, so that they are not powerful enough to defend themselves against a mass attack. It is very easy for governments to divert attention from their own mistakes by blaming Jews for this or that political theory, such as communism or socialism.

For instance, after the First World War, many Germans accused the Jews first of starting the war and then of losing it. This is nothing new, of course. Throughout history, Jews have been accused of all sorts of treachery, such as poisoning water wells or murdering children as religious sacrifices. Much of this can be attributed to jealousy, because, despite the fact that Jewish people have always been thinly populated in various countries, they have

always had a disproportionate number of outstanding public figures.

End

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