

Part I. 50 Nobel Laureates Who Believe in GOD: Nobel Scientists (2)

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ABSTRACT

This article covers well-documented quotations from the following thirteen (13) Nobel scientists: Abdus Salam, Antony Hewish, Joseph H. Taylor, Jr., Alexis Carrel, John Eccles, Joseph Murray, Ernst Chain, George Wald, Ronald Ross, Derek Barton, Christian Anfinsen, Walter Kohn, and Richard Smalley.

Key Words: GOD, Nobel laureates, Nobel Scientists, belief, science, religion.

(15) ABDUS SALAM – NOBEL LAUREATE IN PHYSICS

Nobel Prize: Abdus Salam (1926-1996) was awarded the 1979 Nobel Prize in Physics for his work in electroweak theory, which explains the unity of the weak nuclear force and electromagnetism; this theory is the latest stage in the effort to provide a unified description of the four fundamental forces of nature.

Nationality: Pakistani

Education: Ph.D. in mathematics and physics, Cambridge University, 1952

Occupation: Professor of Theoretical Physics at London University and Punjab University (Pakistan); Director of the International Centre for Theoretical Physics in Trieste (Italy) since 1964

1. Abdus Salam concludes his address *'Poor as a Nation'* with the words: "Our society is afflicted with menaces like mountains. Try to remove them from your surroundings with patience. God will have mercy on you one day. Do not be afraid if your endeavours don't bear fruit, but keep on doing your job and God will indeed bless your efforts." (Salam 1990).

2. In an interview for the *New Scientist* (August 26, 1976) Abdus Salam says: "Every human being needs religion, as Jung has so firmly argued; this deeper religious feeling is one of the primary urges of mankind." (Salam 1976).

3. In physics, Prof. Salam has mostly been involved with the problem of symmetries; he explains his interest in the following way: "That may come from my Islamic heritage; for that is the way we consider the universe created by God, with ideas of beauty and symmetry and harmony, with regularity and without chaos. We are trying to discover what the Lord thought; of course we miserably fail most of the time, but sometimes there is great satisfaction in seeing a little bit of the truth." (Salam 1976; *New Scientist*).

4. In his article *Science and Religion* Prof. Salam wrote: "Einstein was born into an Abrahamic faith; in his own view, he was deeply religious. Now this sense of wonder leads most scientists to a Superior Being – der Alte, the Old One, as Einstein affectionately called the Deity – a Superior Intelligence, the Lord of all Creation and Natural Law." (Salam, as cited in Lai and Kidwai 1989, 285).

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(16) ANTONY HEWISH – NOBEL LAUREATE IN PHYSICS

Nobel Prize: Antony Hewish (born 1924) received the 1974 Nobel Prize in Physics for his discovery of pulsars.

Nationality: British

Education: Ph.D. in physics, Cambridge University, 1952

Occupation: Professor of radio astronomy at the Cavendish Laboratory, Cambridge University (1971 – present)

1. To the question, “What do you think about the existence of God?” Prof. Hewish replied: “I believe in God. It makes no sense to me to assume that the Universe and our existence is just a cosmic accident, that life emerged due to random physical processes in an environment which simply happened to have the right properties. As a Christian I begin to comprehend what life is all about through belief in a Creator, some of whose nature was revealed by a man born about 2000 years ago.” (Hewish 2002a).

2. To the inquiry, “What do you think should be the relationship between science and religion? Why do you think so?” Prof. Hewish gave the following answer: “I think both science and religion are necessary to understand our relation to the Universe. In principle, Science tells us how everything works, although there are many unsolved problems and I guess there always will be. But science raises questions that it can never answer. Why did the big bang eventually lead to conscious beings who question the purpose of life and the existence of the Universe? This is where religion is necessary.” (Hewish 2002a).

3. To the question, “What is your opinion on the nature of God? Do you think that God is a rational Creator (Designer)?” Prof. Hewish gave the following answer: “God certainly seems to be a rational Creator. That the entire terrestrial world is made from electrons, protons and neutrons and that a vacuum is filled with virtual particles demands incredible rationality.” (Hewish 2002b).

4. And to the inquiry, “What should be the place of religion in our modern materialistic world?” Antony Hewish replied: “Religion has a most important role in pointing out that there is more to life than selfish materialism.” (Hewish 2002b).

5. “God is a concept, which I need to cohere my total experience. Christianity comes nearest to the formal expression of this for me. You’ve got to have something other than just scientific laws. More science is not going to answer all the questions that we ask.” (Hewish, as cited in *Candid Science IV: Conversations with Famous Physicists* by Istvan Hargittai, London, Imperial College Press, 2004, 637).

* Jocelyn Bell Burnell was an important part of the team of astronomers who discovered pulsars in 1967, for which Antony Hewish and Martin Ryle were awarded the 1974 Nobel Prize in Physics. Jocelyn Bell Burnell is a deeply religious Quaker and Professor of Physics.

(17) JOSEPH H. TAYLOR, Jr. – NOBEL LAUREATE IN PHYSICS

Nobel Prize: Joseph H. Taylor, Jr. (born 1941) received the 1993 Nobel Prize in Physics for the discovery of the first known binary pulsar, and for his work, which supported the Big Bang theory of the creation of the Universe.

Nationality: American

Education: Ph.D. in astronomy, Harvard University, 1968

Occupation: Professor of physics at the University of Massachusetts, Amherst (1969-1981) and Princeton University (1986 – present)

1. "A scientific discovery is also a religious discovery. There is no conflict between science and religion. Our knowledge of God is made larger with every discovery we make about the world." (Taylor, as cited in Brown 2002).

2. To the question, "Would you care to tell me about your relationship to religion?" Prof. Taylor replied: "We are active in the Religious Society of Friends, that is, the Quakers and it's been an important part of our lives, more so for my wife and me than for our children. My wife and I spend time with our faith group; it's a way for us to make connections with our philosophical views on life, why we are on the Earth, and what we can do for others." "The Quakers are a group of Christians who believe that there can be direct communication between an individual and the Spirit, which we may call God. By contemplation and deep inward looking one can effectively commune with this Spirit and to learn things about oneself and about the way one should conduct oneself on Earth." "The group believes that war is not the way to settle differences and that peaceful ways are more likely to be lasting. Quakers have refused fighting wars but have been willing to serve their nations in other capacities." "We believe that there is something of God in every person and therefore human life is sacrosanct and one needs to look for the depth of spiritual presence in others, even in others with whom you disagree." (Taylor, as cited in *Candid Science IV: Conversations with Famous Physicists* by Istvan Hargittai, London, Imperial College Press, 2004, 665-666).

(18) ALEXIS CARREL – NOBEL LAUREATE IN MEDICINE AND PHYSIOLOGY

Nobel Prize: Alexis Carrel (1873–1944) won the 1912 Nobel Prize in Medicine and Physiology "for his work on vascular suturing and the transplantation of blood-vessels and organs." Carrel single-handedly created the method for transplanting organs from one human body to the other. He is the founder of modern transplantology.

Nationality: French; later American resident

Education: M.D., University of Lyons, France, 1900

Occupation: Researcher at the University of Chicago and the Rockefeller Institute for Medical Research, NY; Professor at the University of Lyons, France

1. In his book *Reflections on Life* (New York: Hawthorn Books, 1952) Alexis Carrel wrote: "Jesus knows our world. He does not disdain us like the God of Aristotle. We can speak to Him and He answers us. Although He is a person like ourselves, He is God and transcends all things." (Carrel 1952, Chap. 6, Part 7).

2. "Why are we here? Where do we come from? What are we? Is it absurd to believe in the survival of the soul? Only religion proposes a complete solution to the human problem. Christianity, above all has given a clear-cut answer to the demands of the human soul." (Carrel 1952, Chap. 6, Part 5).

3. "The need of God expresses itself in prayer. Prayer is a cry of distress; a demand for help; a hymn of love. Prayer gives us strength to bear cares and anxieties, to hope when there is no logical motive for hope, to remain steadfast in the midst of catastrophes." (Carrel 1952, Chap. 6, Part 7).

4. In *Reflections on Life*, Prof. Carrel expressed his attitude towards Christianity thus: "We are loved by an immaterial and all-powerful Being. This Being is accessible to our prayers. We must love Him above all creatures. And we ourselves must also love one another. A new era had begun. The only cement strong enough to bind men together had been found. Nevertheless, humanity chose to ignore the importance of this new principle in the organization of its collective life. It is far from having understood that only mutual love could save it from division, ruin and chaos. Nor has it realized that no scientific discovery was so fraught with significance as the revelation of the law of

love by Jesus the Crucified. For this law is, in fact, that of the survival of human societies.” (Carrel 1952, Chap. 3, Part 6).

5. “Christianity offers men the very highest of moralities. It presents to them a God who can be adored because He is within our reach and Whom we ought to love.” (Carrel 1952, Chap. 9, Part 4).

6. “I want to be like smoke in the wind at God’s disposal.” (Carrel, as cited in Newton 1989).

7. “It is, of course, a waste of time to talk to children of theology and duty. But we should follow Kant’s advice and present God to them very early indeed as an invisible father who watches over them and to whom they can address prayers. The true mode of honoring God consists in fulfilling His will.” (Carrel 1952, Chap. 8, Part 3).

8. “The words of Jesus penetrate deeply into the reality of life. They ignore philosophy; they break all the conventions; they are so astonishing, that, even to this day, we find them hard to understand. To him who obeys the law of the jungle, the command to love his neighbor as himself seems absurd.” (Carrel 1952, Chap. 6, Part 7 “The Need of God”).

9. “Nevertheless, Jesus knows our world. Wherever we are at any moment of day or night, Jesus is at our disposition. We can reach Him simply by turning toward Him our desire and our love. It is an easily observable fact that, even in the society created by science and technology, this need of God has persisted.” (Carrel 1952, Chap. 6, Part 7 “The Need of God”). “Millikan, Eddington, and Jeans believe, like Newton, that the cosmos is the product of a Creative Intelligence.” (Carrel 1952, Chap. 6, Part 6).

10. “For modern man, the only rule of conduct is his own good pleasure. Everyone is enclosed in his own egoism like the crab in its shell and, again like the crab, seeks to devour his neighbor.” (Carrel 1952, Chap. 1, Part 1).

11. “It is sheer pride to believe oneself capable of correcting nature, for nature is the work of God. To command nature, we must obey her.” (Carrel 1952, Chap. 2, Part 6).

12. “Our civilization has, in truth, forgotten that it is born of the blood of Christ; it has also forgotten God. But it still understands the beauty of the Gospel narratives and of the Sermon on the Mount. It is still moved by those words of pity and love which bring peace, and sometimes even joy, to the broken, the afflicted, the sick and the dying.” (Carrel 1952, Chap. 3, Part 6).

13. “Christian morality is incomparably more powerful than lay morality. Thus man will never enthusiastically obey the laws of rational conduct unless he considers the laws of life as the commands of a personal God. Unfortunately, most modern men are incapable of acting for the love of their neighbors, of their country or of God, for the only thing they love is themselves.” (Carrel 1952, Chap. 6, Part 2).

See also Alexis Carrel’s books:

- *Prayer*, New York, Morehouse-Gorham, 1948
- *The Voyage to Lourdes*, New York, Harper, 1950
- *Man, the Unknown*, New York, Harper, 1935

(19) JOHN ECCLES – NOBEL LAUREATE IN MEDICINE AND PHYSIOLOGY

Nobel Prize: Sir John Eccles (1903–1997) received the 1963 Nobel Prize in Medicine and Physiology for establishing the relationship between inhibition of nerve cells and repolarization of a cell's membrane. Eccles' other significant contributions were primarily in the area of brain research. Eccles is one of the greatest neurophysiologists of the XXth century; he is one of the founders of modern electrophysiology.

Nationality: Australian; later British and American resident

Education: M.A. and Ph.D., Oxford University, 1929

Occupation: Professor of Physiology at Oxford University, Australian National University (Canberra), State University of NY, etc.

1. In his article "Modern Biology and the Turn to Belief in God" that he wrote for the book, *The Intellectuals Speak Out About God: A Handbook for the Christian Student in a Secular Society* (1984), John Eccles came to the following conclusion: "Science and religion are very much alike. Both are imaginative and creative aspects of the human mind. The appearance of a conflict is a result of ignorance. We come to exist through a divine act. That divine guidance is a theme throughout our life; at our death the brain goes, but that divine guidance and love continues. Each of us is a unique, conscious being, a divine creation. It is the religious view. It is the only view consistent with all the evidence." (Eccles 1984, 50).

2. In an interview published in the scientific anthology, *The Voice of Genius* (1995), Prof. Eccles stated: "There is a fundamental mystery in my personal existence, transcending the biological account of the development of my body and my brain. That belief, of course, is in keeping with the religious concept of the soul and with its special creation by God." (Eccles, as cited in Brian 1995, 371).

3. "I am constrained to attribute the uniqueness of the Self or Soul to a supernatural spiritual creation. To give the explanation in theological terms: each Soul is a new Divine creation which is implanted into the growing foetus at some time between conception and birth." (Eccles 1991, 237).

4. In *The Human Mystery*, Eccles writes: "I believe that there is a Divine Providence operating over and above the materialist happenings of biological evolution." (Eccles 1979, 235).

5. "If I consider reality as I experience it, the primary experience I have is of my own existence as a unique self-conscious being which I believe is God-created." (Eccles, as cited in Margenau and Varghese 1997, 161).

6. Eccles described the so-called 'promissory materialism' thus: "There has been a regrettable tendency of many scientists to claim that science is so powerful and all pervasive that in the not too distant future it will provide an explanation in principle for all phenomena in the world of nature, including man, even of human consciousness in all its manifestations. In our recent book (*The Self and Its Brain*, Popper and Eccles, 1977) Popper has labelled this claim as promissory materialism, which is extravagant and unfulfillable. Yet on account of the high regard for science, it has great persuasive power with the intelligent laity because it is advocated unthinkingly by the great mass of scientists who have not critically evaluated the dangers of this false and arrogant claim." (Eccles 1979, p. 1).

7. With respect to 'promissory materialism', in his book *How the Self Controls Its Brain* (Berlin: Springer-Verlag, 1994), Eccles wrote: "I regard this theory as being without foundation. The more we discover scientifically about the brain the more clearly do we distinguish between the brain events

and the mental phenomena and the more wonderful do the mental phenomena become. Promissory materialism is simply a superstition held by dogmatic materialists. It has all the features of a Messianic prophecy, with the promise of a future freed of all problems - a kind of Nirvana for our unfortunate successors." (Eccles 1994).

8. In his book *Evolution of the Brain: Creation of the Self* (London: Routledge, 1991), Eccles wrote: "I maintain that the human mystery is incredibly demeaned by scientific reductionism, with its claim in promissory materialism to account eventually for all of the spiritual world in terms of patterns of neuronal activity. This belief must be classed as a superstition. We have to recognize that we are spiritual beings with souls existing in a spiritual world as well as material beings with bodies and brains existing in a material world." (Eccles 1991, 241).

9. "Since materialist solutions fail to account for our experienced uniqueness, I am constrained to attribute the uniqueness of the self or soul to a supernatural spiritual creation. This conclusion is of inestimable theological significance. It strongly reinforces our belief in the human soul and in its miraculous origin in a divine creation." (Eccles 1994, 168).

10. "As a dualist I believe in the reality of the world of mind or spirit as well as in the reality of the material world. Furthermore I am a finalist in the sense of believing that there is some Design in the processes of biological evolution that has eventually led to us self-conscious beings with our unique individuality; and we are able to contemplate and we can attempt to understand the grandeur and wonder of nature." (Eccles 1979, 9).

Eccles' teacher, the Nobelist in neurophysiology **Sir Charles Sherrington**, too, is a **dualist**; Sherrington maintains that our nonmaterial mind is fundamentally different from our physical body. Sherrington believes in an almighty Deity and Natural Religion. (See Charles Sherrington, *Man on His Nature. The Gifford Lectures in Natural Theology*, Cambridge University Press, 1975, 59 and 293).

There are many other **Nobel scientists**, who have explored thoroughly the mind-body problem, and who are staunch **dualists**: **George Wald, Nevill Mott, M. Planck, E. Schroedinger, Brian D. Josephson, Santiago Ramon y Cajal, Roger Sperry, Albert Szent-Gyorgyi, Walter R. Hess, Henri Bergson, Alexis Carrel**, etc. (See Margenau and Varghese 1997, *'Cosmos, Bios, Theos'*; see also Popper and Eccles 1977, *The Self and Its Brain*).

See the sections on **George Wald, Nevill Mott, M. Planck, and E. Schroedinger** in this work.

11. In his article "Scientists in Search of the Soul" (*Science Digest*, 1982), the science writer John Gliedman pointed out: "Eccles strongly defends the ancient religious belief that human beings consist of a mysterious compound of physical body and intangible spirit. Each of us embodies a nonmaterial thinking and perceiving self that 'entered' our physical brain sometime during embryological development or very early childhood, says the man who helped lay the cornerstones of modern neurophysiology. This 'ghost in the machine' is responsible for everything that makes us distinctly human: conscious self-awareness, free will, personal identity, creativity and even emotions such as love, fear, and hate. Our nonmaterial self controls its "liaison brain" the way a driver steers a car or a programmer directs a computer. Man's ghostly spiritual presence, says Eccles, exerts just the whisper of a physical influence on the computerlike brain, enough to encourage some neurons to fire and others to remain silent. Boldly advancing what for most scientists is the greatest heresy of all, Eccles also asserts that our nonmaterial self survives the death of the physical brain." (Gliedman 1982, 77).

12. "We can regard the death of the body and brain as dissolution of our dualist existence. Hopefully, the liberated soul will find another future of even deeper meaning and more entrancing experiences,

perhaps in some renewed embodied existence in accord with traditional Christian teaching.” (Eccles 1991, 242).

13. “I do believe that we are the product of the creativity of what we call God. I hope that this life will lead to some future existence where my self or soul will have another existence, with another brain, or computer if you like. I don’t know how I got this one, it’s a pretty good one, and I’m grateful for it, but I do know as a realist that it will disappear. But I think my conscious self or soul will come through.” (Eccles, as cited in Gilling and Brightwell, *The Human Brain*, 1982, 180).

14. In his book *The Human Mystery*, Sir John Eccles said: “The amazing success of the theory of evolution has protected it from significant critical evaluation in recent times. However it fails in a most important respect. It cannot account for the existence of each one of us as unique, self-conscious beings.” (Eccles 1979, 96).

15. Sir John Eccles maintains that the will of the human beings is free, and that’s why he denies the so-called physical determinism: “If physical determinism is true, then that is the end of all discussion or argument; everything is finished. There is no philosophy. All human persons are caught up in this inexorable web of circumstances and cannot break out of it. Everything that we think we are doing is an illusion.” (See Popper and Eccles, 1977, 546).

16. “With self-conscious purpose a person has a great challenge in choosing what life to live. One can choose to live dedicated to the highest values, truth, love, and beauty, with gratitude for the divine gift of life with its wonderful opportunities of participating in human culture. One can do this in accord with opportunities. For example, one of the highest achievements is to create a human family living in a loving relationship. I was brought up religiously under such wonderful conditions, for which I can be eternally grateful. There are great opportunities in a life dedicated to education or science or art or to the care of the sick. Always one should try to be in a loving relationship with one’s associates. We are all fellow beings mysteriously living on this wonderful spaceship planet Earth that we should cherish devotedly, but not worship.” (Eccles, as cited in Templeton 1994, 131).

17. In his letter to Erika Erdmann (December 19, 1990), Eccles said: “You refer to protection of our Earth as the most urgent goal at present. I disagree. It is to save mankind from materialist degradation. It comes in the media, in the consumer society, in overriding quest for power and money, in the degradation of our values (that used to be thought as based on love, truth, and beauty), and in the disintegration of the human family.” (Eccles 1990).

18. “I repudiate philosophies and political systems which recognize human beings as mere things with a material existence of value only as cogs in the great bureaucratic machine of the state, which thus becomes a slave state. The terrible and cynical slaveries depicted in Orwell’s ‘1984’ are engulfing more and more of our planet. Is there yet time to rebuild a philosophy and a religion that can give us a renewed faith in this great spiritual adventure, which for each of us is a human life lived in freedom and dignity?” (Eccles 1979, 237).

(20) JOSEPH MURRAY – NOBEL LAUREATE IN MEDICINE AND PHYSIOLOGY

Nobel Prize: Joseph E. Murray (born 1919) was granted the 1990 Nobel Prize in Medicine and Physiology for work that “proved to a doubting world that it was possible to transplant organs to save the lives of dying patients.” Murray was the first to perform kidney transplants. He is one of the founders of modern transplantology.

Nationality: American

Education: M.D., Harvard University, 1943

Occupation: Professor of Surgery at Harvard Medical School; chief plastic surgeon at Children's Hospital Medical Center, Boston

1. In an interview for the *National Catholic Register* (December 1-7, 1996), Prof. Joseph Murray asserts that there is no conflict between religion and science: "Is the Church inimical to science? Growing up as a Catholic and a scientist – I don't see it. One truth is revealed truth, the other is scientific truth. If you really believe that creation is good, there can be no harm in studying science. The more we learn about creation – the way it emerged – it just adds to the glory of God. Personally, I've never seen a conflict." (Murray, as cited in Meyer 1996).

2. "We're just working with the tools God gave us. There's no reason that science and religion have to operate in an adversarial relationship. Both come from the same source, the only source of truth – the Creator." (Murray, as cited in Meyer 1996).

3. In his article "Murray: Surgeon with soul" (*Harvard University Gazette*, 4 October 2001), John Lenger wrote: "To Murray, a doctor's responsibility is to treat each patient as not just a set of symptoms, but as someone with a spirit that can be helped through medical procedures. The title of his autobiography, *Surgery of the Soul* (Boston Medical Library, 2001), stems from Murray's spiritually based approach to medicine. Though he has in the past hesitated to talk publicly about his faith, for fear of being lumped in with the televangelist crowd, Murray is deeply religious. 'Work is a prayer,' he said, 'and I start off every morning dedicating it to our Creator. Every day is a prayer – I feel that, and I feel that very strongly.'" (Murray, as cited in Lenger 2001).

4. "I think the important thing to realize is how little we know about anything – how flowers unfold, how butterflies migrate. We have to avoid the arrogance of persons on either side of the science-religion divide who feel that they have all the answers. We have to try to use our intellect with humility." (Murray, as cited in Meyer 1996).

5. "There are a lot of moral problems that my Jesuit training has helped me with. In my own conscience, I've never had a conflict between my religious upbringing and my science." (Murray, as cited in Meyer 1996).

(21) ERNST CHAIN – NOBEL LAUREATE IN MEDICINE AND PHYSIOLOGY

Nobel Prize: Sir Ernst Chain (1906-1979) received the 1945 Nobel Prize in Medicine and Physiology "for the discovery of penicillin and its curative effect in various infectious diseases."

Nationality: German

Education: Ernst Chain graduated in chemistry and physiology from Friedrich-Wilhelm University in Berlin with a Ph.D. degree in 1930.

Occupation: Researcher at the Institute of Pathology in Berlin (1930-33), Cambridge University (1933-35), Oxford University (1936-48) and Istituto Superiore di Sanità in Rome (1948-1961); Professor of Biochemistry at Imperial College, University of London (1961-1973); Chain was a chairman of the World Health Organization.

1. Concerning the Materialistic theory of evolution Ernst Chain (who is a theistic evolutionist) states: "I would rather believe in fairies than in such wild speculation. I have said for years that speculations about the origin of life lead to no useful purpose as even the simplest living system is far too complex to be understood in terms of the extremely primitive chemistry scientists have used in their attempts to explain the unexplainable that happened billions of years ago. God cannot be explained away by such naive thoughts." (Chain, as cited in *The Life of Ernst Chain: Penicillin and Beyond* by Ronald W. Clark, London, Weidenfeld & Nicolson, 1985, 147-148).

2. In his speech, which he made at the World Jewish Conference of Intellectuals in 1965, Chain said: "While we have witnessed astonishing technological progress over the last 4,000 years, human relations have remained essentially unchanged since the time the Torah was written, and have to be regulated by very much the same laws. For this reason the fundamental teaching of Judaism, as expressed in the Old Testament, and developed by the great sages of the Middle Ages, one unitarian Almighty, benevolent, all-pervading, eternal Divine force, of which the spirit of man was created an image, is for me still the most rational way of accepting man's position and fate in this world and the Universe." (Chain, as cited in Clark 1985, 154).

3. In a speech made when he accepted a Doctorate of Philosophy Honoris Causa from Bar-Ilan University (Israel), Chain said: "It must be remembered that, quite apart from the ephemeral nature of scientific theories, pure science is ethically neutral. No value of good or bad is attached to any natural constant, or, for that matter, any scientific observation in any field. However, in our relations to our fellow-men – and this includes, in particular, the applications of scientific research – we must be guided by an ethical code of behaviour, and pure science cannot provide it." "In the search for an ethical code of behaviour we have to look for more lasting values than scientific discoveries or theories. We, the Jewish people, have had the extraordinary privilege to have been given a lasting code of ethical values in the divinely inspired laws and traditions of Judaism which have become the basic pillars of the Western world." (Chain, as cited in Clark 1985, 146)."

4. "I consider the power to believe to be one of the great divine gifts to man through which he is allowed in some inexplicable manner to come near to the mysteries of the Universe without understanding them. The capability to believe is as characteristic and as essential a property of the human mind as is its power of logical reasoning, and far from being incompatible with the scientific approach, it complements it and helps the human mind to integrate the world into an ethical and meaningful whole." "There are many ways in which people are made aware of their power to believe in the supremacy of Divine guidance and power: through music or visual art, some event or experience decisively influencing their life, looking through a microscope or telescope, or just by looking at the miraculous manifestations or purposefulness of Nature." (Chain, as cited in Clark 1985, 143).

5. In his public lecture "*Social Responsibility and the Scientist in Modern Western Society*" (University of London, February 1970) Sir Ernst Chain declared: "As far as my own actions are concerned, I am trying to be guided by the laws, ethics and traditions of Judaism as formulated in the Old Testament, which are, of course, also the basis of Christianity. I am convinced, and have been for many years, that it is impossible to construct a sort of absolute and generally applicable code of ethical behaviour on the basis of scientific knowledge alone, if only for the reason that our knowledge about the basic problems of life is far too fragmentary and limited, and will always remain so.... We all know that scientific theories, in whatever field, are ephemeral and likely to be shaken in their foundations, and may be even turned upside down by the discovery of one single new fact which does not fit into the existing system. For this reason I do not believe that it is possible to construct an absolute code of ethical conduct and of moral values on the basis of scientific knowledge alone, as this must always remain fragmentary and built on flimsy premises and, therefore, can easily lead to misleading conclusions which may have to be corrected in the light of new evidence." (E. Chain, "*Social Responsibility and the Scientist in Modern Western Society*," *Perspectives in Biology and Medicine*, Spring 1971, Vol. 14, No. 3, p. 366).

6. Chain described "the divine spark which manifests itself so evidently in the spiritual creation of man" thus: "Any speculation and conclusions pertaining to human behaviour drawn on the basis of Darwinian evolutionary theories from animal ethological studies, and in particular ethological studies

on primates, must be treated with the greatest caution and reserve." "It may be amusing for those engaged in the task to describe their fellow man as naked apes, and a less discriminating section of the public may enjoy reading about comparisons between the behaviour of apes and man, but this approach – which, by the way, is neither new nor original – does not really lead us very far." "We do not need to be expert zoologists, anatomists or physiologists to recognise that there exist some similarities between apes and man, but surely we are much more interested in the differences than the similarities. Apes, after all, unlike man, have not produced great prophets, philosophers, mathematicians, writers, poets, composers, painters and scientists. They are not inspired by the divine spark which manifests itself so evidently in the spiritual creation of man and which differentiates man from animals." (Chain 1971, 368).

7. "Only one theory has been advanced to make an attempt to understand the development of life – the Darwin-Wallace theory of evolution. And a very feeble attempt it is, based on such flimsy assumptions, mainly of morphological-anatomical nature that it can hardly be called a theory." (Chain, as cited in Clark 1985, 147).

8. Concerning the Darwin-Wallace theory of evolution Chain wrote: "It is, of course, nothing but a truism, and not a scientific theory, to say that living systems do not survive if they are not fit to survive." "To postulate, as the positivists of the end of the 19th century and their followers here have done, that the development and survival of the fittest is entirely a consequence of chance mutations, or even that nature carries out experiments by trial and error through mutations in order to create living systems better fitted to survive, seems to me a hypothesis based on no evidence and irreconcilable with the facts." "This hypothesis wilfully neglects the principle of teleological purpose which stares the biologist in the face wherever he looks, whether he be engaged in the study of different organs in one organism, or even of different subcellular compartments in relation to each other in a single cell, or whether he studies the interrelation and interactions of various species." "These classical evolutionary theories are a gross oversimplification of an immensely complex and intricate mass of facts, and it amazes me that they were swallowed so uncritically and readily, and for such a long time, by so many scientists without a murmur of protest." (Chain 1971, 367).

(22) GEORGE WALD – NOBEL LAUREATE IN MEDICINE AND PHYSIOLOGY

Nobel Prize: George Wald (1906-1997) received the 1967 Nobel Prize in Medicine and Physiology for his work on the biochemistry of vision.

Nationality: American

Education: Ph.D. in biology, Columbia University, 1932

Occupation: Professor of Biology at Harvard University (1948-1977)

WALD – THE STAUNCH ATHEIST

1. In 1954 Prof. George Wald (who was still an atheist at that time) wrote in *Scientific American*: "When it comes to the origin of life there are only two possibilities: creation or spontaneous generation. There is no third way. Spontaneous generation was disproved one hundred years ago, but that leads us to only one other conclusion, that of supernatural creation. We cannot accept that on philosophical grounds; therefore, we choose to believe the impossible: that life arose spontaneously by chance!" (George Wald, 1954, "The Origin of Life," *Scientific American*, 191 [2]: 48).

2. "The reasonable view was to believe in spontaneous generation; the only alternative, to believe in a single, primary act of supernatural creation. There is no third position. Most modern biologists, having reviewed with satisfaction the downfall of the spontaneous generation hypothesis, yet

unwilling to accept the alternative belief in special creation, are left with nothing.” (Wald 1954, “The Origin of Life,” *Scientific American*, 191 [2]: 45-46).

WALD’S SCIENTIFIC DEISM

3. Nevertheless, George Wald underwent an astonishing change of mind during the early 1980s, and he came very close to religious mentality. In his article “Life and Mind in the Universe” (1984) Prof. Wald wrote:

“In my life as scientist I have come upon two major problems which, though rooted in science, though they would occur in this form only to a scientist, project beyond science, and are I think ultimately insoluble as science. That is hardly to be wondered at, since one involves **consciousness** and the other, **cosmology**.

1) The consciousness problem was hardly avoidable by one who has spent most of his life studying mechanisms of vision. We have learned a lot, we hope to learn much more; but none of it touches or even points, however tentatively, in the direction of what it means to see. Our observations in human eyes and nervous systems and in those of frogs are basically much alike. I know that I see; but does a frog see? It reacts to light; so do cameras, garage doors, any number of photoelectric devices. But does it see? Is it aware that it is reacting? There is nothing I can do as a scientist to answer that question, no way that I can identify either the presence or absence of consciousness. I believe consciousness to be a permanent condition that involves all sensation and perception. Consciousness seems to me to be wholly impervious to science.

2) The second problem involves the special properties of our universe. Life seems increasingly to be part of the order of nature. We have good reason to believe that we find ourselves in a universe permeated with life, in which life arises inevitably, given enough time, wherever the conditions exist that make it possible. Yet were any one of a number of the physical properties of our universe otherwise – some of them basic, others seemingly trivial, almost accidental – that life, which seems now to be so prevalent, would become impossible, here or anywhere. It takes no great imagination to conceive of other possible universes, each stable and workable in itself, yet lifeless. How is it that, with so many other apparent options, we are in a universe that possesses just that peculiar nexus of properties that breeds life?

It has occurred to me lately – I must confess with some shock at first to my scientific sensibilities – that both questions might be brought into some degree of congruence. This is with the assumption that Mind, rather than emerging as a late outgrowth in the evolution of life, has existed always as the matrix, the source and condition of physical reality – that the stuff of which physical reality is composed is mind-stuff. It is Mind that has composed a physical universe that breeds life, and so eventually evolves creatures that know and create.”

(George Wald, 1984, “Life and Mind in the Universe”, *International Journal of Quantum Chemistry: Quantum Biology Symposium* 11, 1984: 1-15).

4. In 1986 in his address to the First World Congress for the *Synthesis of Science & Religion* held in Bombay, India, George Wald stated:

“I come toward the end of my life as a scientist facing two great problems. Both are rooted in science, and I approach both as would only a scientist. Yet I believe that both are irrevocably – forever – unassimilable as science. And that is hardly strange, since one involves **cosmology**, the other, **consciousness**.

Cosmology

The burden of this story is that we find ourselves in a universe that breeds life and possesses the very particular properties that make that possible. The more deeply one penetrates, the more remarkable and subtle the fitness of this universe for life appears. Endless barriers lie in the way, yet each is surmounted somehow. It is as though, starting from the Big Bang, the universe pursued an *intention* to breed life, such is the subtlety with which difficulties in the way are got around, such are the singular choices in the values of key properties that could potentially have taken any value.

And now for my main thesis. If any one of a considerable number of the physical properties of our universe were other than they are – some of those properties fundamental, others seeming trivial, even accidental – then life, that now appears to be so prevalent, would be impossible, here or anywhere.

Consciousness

I know that I *see*. But does a frog *see*? It reacts to light; so does a photoelectrically activated garage door. Does the frog *know* that it is reacting to light, is it self-aware? Now the dilemma: There is nothing whatever that I can do as a scientist to answer that kind of question.

Does that garage door resent having to open when the headlights of my car shine on it? I think not. Does a computer that has just beaten a human player at chess feel elated? I think not; but there is nothing one can do about those situations either.

I had already for some time taken it as a foregone conclusion that the mind - consciousness – could not be located. It is essentially absurd to think of locating a phenomenon that yields no physical signals, the presence or absence of which - outside of humans and their like – cannot be identified. But further than that, mind is not only not locatable, *it has no location*. It is not a *thing* in space and time, not measurable; hence – as I said at the beginning of this paper – not assimilable as science.

Mind and Matter

A few years ago it occurred to me that these seemingly very disparate problems might be brought together. That would be with the hypothesis that Mind, rather than being a very late development in the evolution of living things, restricted to organisms with the most complex nervous systems – all of which I had believed to be true – that Mind instead has been there always, and that this universe is life-breeding because the pervasive presence of Mind had guided it to be so.

That thought, though elating as a game is elating, so offended my scientific possibilities as to embarrass me. It took only a few weeks, however, for me to realize that I was in excellent company. That kind of thought is not only deeply embedded in millennia-old Eastern philosophies, but it has been expressed plainly by a number of great and very recent physicists.

So Arthur Eddington (1928): ‘The stuff of the world is mind-stuff. The mind-stuff is not spread in space and time.’

So Erwin Schroedinger: ‘Mind has erected the objective outside world of the natural philosopher out of its own stuff.’

Let me say that it is not only easier to say these things to physicists than to my fellow biologists, but easier to say them in India than in the West. For when I speak of Mind pervading the universe, of Mind as a creative principle perhaps primary to matter, any Hindu will acquiesce, will think, yes, of course, he is speaking of Brahman [God].

That is the stuff of the universe, mind-stuff; and yes, each of us shares in it.”

(George Wald, 1989, "The Cosmology of Life and Mind." *Noetic Sciences Review*, No. 10, p. 10, Spring 1989. Institute of Noetic Sciences, California).

(23) RONALD ROSS – NOBEL LAUREATE IN MEDICINE AND PHYSIOLOGY

Nobel Prize: Sir Ronald Ross (1857-1932) received the 1902 Nobel Prize in Medicine and Physiology for his remarkable work on malaria.

Nationality: British

Education: From 1874 to 1881 he studied medicine at St. Bartholomew's Hospital (London) and the Army Medical School.

Occupation: Professor of Tropical Medicine at Liverpool University (1902-1912); Vice-President of the Royal Society (1911-1913)

1. On August 20, 1897, Sir Ronald Ross made his landmark discovery that malaria is transmitted to people by *Anopheles* mosquitoes. On that day of discovery he wrote the following poetic words in his Journal:

"This day relenting God
Hath placed within my hand
A wondrous thing; and God
Be praised. At His command,
Seeking His secret deeds
With tears and toiling breath,
I find thy cunning seeds,
O million-murdering Death.
I know this little thing
A myriad men will save.
O Death, where is thy sting?
Thy victory, O Grave?"

(Ronald Ross, *Memoirs*, London, John Murray, 1923, 226).

2. Sir Ronald Ross wrote another poem:

"Before Thy feet I fall,
Lord, who made high my fate;
For in the mighty small
Thou showed'st the mighty great.
Henceforth I will resound
But praises unto Thee;
Tho' I was beat and bound,
Thou gavest me victory."

(Ronald Ross, as cited in the *Dictionary of Scientific Biography*, 1975, vol. XI, p. 557, NY: Charles Scribner's Sons).

(24) DEREK BARTON – NOBEL LAUREATE IN CHEMISTRY

Nobel Prize: Sir Derek Barton (1918–1998) won the 1969 Nobel Prize in Chemistry for his contribution to the development of the conformational analysis (the study of the three-dimensional geometric structure of complex molecules) as an essential part of organic chemistry.

Nationality: British

Education: Ph.D. in organic chemistry, Imperial College (London), 1942; D.Sc., University of London, 1949

Occupation: Professor of Chemistry at Imperial College (London), Harvard University, University of London, University of Glasgow (Scotland), etc.

1. “God is Truth. There is no incompatibility between science and religion. Both are seeking the same truth. Science shows that God exists.” (Barton, as cited in Margenau and Varghese 1997, 144).

2. “The observations and experiments of science are so wonderful that the truth that they establish can surely be accepted as another manifestation of God. God shows himself by allowing man to establish truth.” (Barton, as cited in Margenau and Varghese 1997, 145).

3. To the question, “Many prominent scientists - including Darwin, Einstein, and Planck - have considered the concept of God very seriously. What are your thoughts on the concept of God and on the existence of God?” Sir Derek Barton gave the following answer: “As I have already stated, God is Truth. But does God really have anything to do with man? Certainly I cannot believe that God accepts only one religion, or one sect, as the only group authorized to speak for man. I would believe that God accepts all, even those who pretend not to believe. Morality and religion interact and much beneficial human behavior results from this interaction.” (Barton, as cited in Margenau and Varghese 1997, 147).

4. “Our universe is infinitely large and infinitely small. It is infinite in time past and in future time. We can never understand infinity. It is the ultimate truth, which is God.” (Barton, as cited in Margenau and Varghese 1997, 144).

5. “So religion is finally about the relationship of the individual and God. Can one speak to God? Prayers to God to advance one’s personal welfare, at the expense of the less righteous, are surely not welcome. Prayers to God to let one discover truth might be acceptable. Certainly, it is remarkable how we have been able to understand so much in our environment. God permits man to make observations and experiments which can be interpreted by logical thinking.” (Barton, as cited in Margenau and Varghese 1997, 147).

(25) CHRISTIAN ANFINSEN – NOBEL LAUREATE IN CHEMISTRY

Nobel Prize: Christian Anfinsen (1916–1995) was awarded the 1972 Nobel Prize in Chemistry “for his work on ribonuclease, especially concerning the connection between the amino acid sequence and the biologically active conformation.” Anfinsen is a pioneer in the study of enzymes.

Nationality: American

Education: Ph.D. in biochemistry, Harvard University, 1943

Occupation: Professor of Chemistry at Harvard University and University of Pennsylvania; Researcher at Carlsberg University (Denmark), National Institute of Health (Bethesda)

and National Institute of Arthritis, Metabolism and Digestive Diseases; Professor of Biology at Johns Hopkins University from 1982 until his death

1. To the question, "Many prominent scientists - including Darwin, Einstein, and Planck - have considered the concept of God very seriously. What are your thoughts on the concept of God and on the existence of God?" Christian Anfinsen replied: "I think only an idiot can be an atheist. We must admit that there exists an incomprehensible power or force with limitless foresight and knowledge that started the whole universe going in the first place." (Anfinsen, as cited in Margenau and Varghese, *'Cosmos, Bios, Theos'*, 1997, 139).

2. Prof. Anfinsen wrote to the compilers of the scientific anthology *'Cosmos, Bios, Theos'* (1997) this: "I enclose a favorite quotation from Einstein that agrees almost completely with my own point of view. Einstein himself once said that 'The most beautiful and most profound emotion we can experience is the sensation of the mystical. It is the sower of all true science. He to whom this emotion is a stranger, who can no longer stand rapt in awe, is as good as dead. That deeply emotional conviction of the presence of a superior reasoning power, which is revealed in the incomprehensible Universe, forms my idea of God.'" (Anfinsen, as cited in Margenau and Varghese, *'Cosmos, Bios, Theos'*, 1997, 140).

3. In his letter of 28 March 1989 to Prof. Henry Margenau (compiler of the scientific anthology *'Cosmos, Bios, Theos'*), Anfinsen wrote: "Thank you for your letter of March 13 and your kind words about my small contribution to your anthology. I can think of little more to add to my final point having to do with the nature of God and the existence of God. Clearly, an all-powerful, all-knowing entity must exist to explain our existence." (Anfinsen 1989).

4. In 1979, Anfinsen converted to Orthodox Judaism, a commitment he retained for the rest of his life; he maintained that he had been deeply impressed by the "the history, practice and intensity of Judaism." On 16 November 1995, in her Memorial speech for Christian Anfinsen at Memorial Garden Dedication, Weizmann Institute, Libby Anfinsen (Prof. Anfinsen's wife) said: "His religious background is interesting in that his Jewish maternal grandmother's family disappeared when the Nazis invaded Bergen, Norway. His parents were Bible reading Lutherans, and he himself was an agnostic until the later 70's when he studied and converted to traditional Judaism. He felt the following quote from Einstein accurately expressed his beliefs. 'The most beautiful and most profound emotion we can experience is the sensation of the mystical. It is the sower of all true science. He to whom this emotion is a stranger, who can no longer stand rapt in awe, is as good as dead. That deeply emotional conviction of the presence of a superior reasoning power, which is revealed in the incomprehensible Universe, forms my idea of God.' He xeroxed and distributed this quote to many." (Libby Anfinsen, 1995).

(26) WALTER KOHN – NOBEL LAUREATE IN CHEMISTRY

Nobel Prize: Walter Kohn (born 1923) won the 1998 Nobel Prize in Chemistry for his work on the development of the density functional theory, which fundamentally transformed scientists' approach to the electronic structure of atoms and molecules.

Nationality: Austrian; later American citizen

Education: Ph.D. in physics, Harvard University, 1948

Occupation: Professor of Physics at the University of California, San Diego (1960-1979); Director of the Institute for Theoretical Physics, University of California, Santa Barbara (1979-1984); Professor of Physics at the UCSB, Santa Barbara (1984-1991); Professor

Emeritus of Physics and Research Professor at the UCSB, Santa Barbara (1991-present).

1. In the interview, entitled “Dr. Walter Kohn: Science, Religion, and the Human Experience” (July 26, 2001), Dr. Kohn stated: “I am Jewish and have a strong identification with Judaism. I would say I see myself as religious simultaneously in two ways. One is that I have found that religion, specifically the Jewish religion, has very much enriched my own life and is something that I have conveyed to my children and feel their lives also have been enriched by. Secondly, I am very much of a scientist, and so I naturally have thought about religion also through the eyes of a scientist. When I do that, I see religion not denominationally, but in a more, let us say, deistic sense. I have been influenced in my thinking by the writings of Einstein who has made remarks to the effect that when he contemplated the world he sensed an underlying Force much greater than any human force. I feel very much the same. There is a sense of awe, a sense of reverence, and a sense of great mystery.” (Kohn 2001a).

2. To the question, “When you refer to yourself as a deist, I understand deism to mean the belief that some divine force set the universe in motion, but after that it’s basically a hands-off relationship. Is that what you mean by deism?” Dr. Kohn replied: “It includes that. I see no reason to believe that every once in awhile the laws of nature, that as scientists we study, are suspended by divine intervention. But at the same time I do not see the universe as necessarily proceeding in a simple, totally predictable, mechanistic fashion. There continue to be very deep epistemological questions about the significance of sharp scientific laws like the laws of quantum mechanics and the laws that govern the nature of chaos. Both of these fields have irreversibly shaken the 18th and 19th centuries’ purely deterministic, mechanistic view of the world.” “These are my reactions to your question as to how I see deism and your statement - to paraphrase what you said - that the world is set in motion by some divine force and now it runs on its own. I’m trying to say it’s not quite so simple. It’s incredible, one struggles for the right word. One feels awe and reverence for the world of experience and the world of science.” “In any case there’s a sense of a world that to an amazing extent yields to our comprehension, but fundamentally remains incomprehensible. And because it is manifestly such a wonderful thing, it leads one - I follow here in Einstein’s footsteps - to sense some Force that can take responsibility and credit for it.” (Kohn 2001a).

3. To the question, “What do you think should be the relationship between science and religion?” Walter Kohn replied: “Mutual respect. They are complementary important parts of the human experience.” (Kohn 2002). And to the inquiry, “What do you think about the existence of God?” Walter Kohn gave the following answer: “There are essential parts of the human experience about which science intrinsically has nothing to say. I associate them with an entity which I call God.” (Kohn 2002).

4. In his lecture *Reflections of a Physicist after an Encounter with the Vatican and Pope John Paul II* (April 20, 2001, University of California, Santa Barbara) Dr. Kohn said: “Certainly science, especially physics and chemistry, is a very important part of my identity. But I also consider myself a religious person, and in two senses: one, based on my liberal Jewish upbringing which I have passed on to my children; the other, a kind of non-denominational deism which springs from my awe of the world of our experiences and is heightened by my identity as a scientist. It also includes a conviction that science alone is an insufficient guide to life, leaving many deep questions unanswered and needs unfulfilled.” (Kohn 2001b).

(27) RICHARD SMALLEY – NOBEL LAUREATE IN CHEMISTRY

Nobel Prize: Richard Smalley (1943-2005) won the 1996 Nobel Prize in Chemistry for the discovery of fullerenes – the third elemental form of carbon (along with graphite and diamond). Upon his passing, the US Senate passed a resolution to honor Smalley, crediting him as the “Father of Nanotechnology.”

Nationality: American

Education: Ph.D. in chemistry, Princeton University (USA), 1973

Occupation: Professor of Chemistry and Professor of Physics at Rice University in Houston, Texas (1981-2005)

1. “Recently I have gone back to church regularly with a new focus to understand as best I can what it is that makes Christianity so vital and powerful in the lives of billions of people today, even though almost 2000 years have passed since the death and resurrection of Christ. Although I suspect I will never fully understand, I now think the answer is very simple: it’s true. God did create the universe about 13.7 billion years ago, and of necessity has involved Himself with His creation ever since. The purpose of this universe is something that only God knows for sure, but it is increasingly clear to modern science that the universe was exquisitely fine-tuned to enable human life. We are somehow critically involved in His purpose. Our job is to sense that purpose as best we can, love one another, and help Him get that job done.” (Smalley 2005).

2. The books *‘Origins of Life’* and *‘Who Was Adam?’* are authored by Dr. Hugh Ross (astrophysicist) and Dr. Fazale Rana (biochemist). Richard Smalley had this to say about these books: “Evolution has just been dealt its death blow. After reading *‘Origins of Life’*, with my background in chemistry and physics, it is clear evolution could not have occurred. The new book, *‘Who Was Adam?’*, is the silver bullet that puts the evolutionary model to death.” (Smalley 2005a).

3. In his address at the Tuskegee University’s 79th Annual Scholarship Convocation (October 3, 2004) Smalley mentioned the ideas of evolution versus creationism, Darwin versus the Bible’s ‘Genesis’; then he pointed out: “The burden of proof is on those who don’t believe that ‘Genesis’ was right, and there was a creation, and that Creator is still involved.” (Smalley 2004).