Believing in Science

The ambiguity in this title is the same as that in the title of the first lecture: “Believing in Industry”. In that lecture I spoke about the nature of Christian belief in the secularized situation of and industrial works in the 1960s. The other meaning of the title was implied rather than stated. It was that there is a general approval of industrial enterprise as the way to provide for the livelihood and careers of thousands of the population. Everyone wants a job and at that time it was believed that jobs could be got through industrial development.

In the case of science it cannot be said that everyone believes in it wholeheartedly. To be sure all but the tiniest minority of people live by the results of science in contemporary society. Every time one turns on a light or travels around by car, train or aircraft one is voting for science. Yet there are many who reject a large part of the position of science today in that they refuse to accept the theory of evolution as the best description of the development of life and in particular human life on earth. These are the people who call themselves Creationists and they insist that the Biblical account of creation in Genesis is scientifically correct. God made the world in seven days and placed within the world the fossil evidence suggesting that the world is very much older.

This, of course, is not a new idea. In the 17th century Archbishop James Usher, a renowned Biblical scholar, and Archbishop of Armargh, calculated that God created the earth around 6000 B.C. on the basis of the Biblical story. And in the 1940s the author Dorothy L Sayers in a little book called “Unpopular Opinions” said much the same thing. Since then the rise of Biblical fundamentalism in the United States has become a growth industry and has affected many educational bodies now teaching Creation Science and refusing to teach Evolution Science, and there are one or two schools in the United Kingdom doing the same.

Those who live in the real world, by which I mean the secularized public sector of contemporary society, tend to regard Creationism with a weary tolerance, and a willingness to let them be as long as they do not try to subvert the freedom of the rest. But it may seem to be a bigger problem for the rest of the Christian Church, and is indeed part of a bigger question about how to deal with those whose commitment to what they call Biblical truth is in conflict with the liberal centre of the Christian church at this time. There is, of course, no single, universally accepted, method of interpreting the Bible. The diversity of methods gives rise to a diversity of results having consequences for morality as well as Christian doctrine. There was a time when the Church dealt with such diversity according to the doctrine of heresy. That doctrine defined heresy as the formal denial or doubt of any doctrine of the Catholic Church.

In practice heretical teaching appeared when one aspect of orthodox doctrine became exaggerated and emphasised to the exclusion of all others. An example of this may be the focus on those texts which appear to condemn homosexuality and which has caused so much disruption to the peace and unity of the Anglican Communion at this time. In the past the Church dealt severely with heretics. Based upon St Matthew 18 v 17*:”If he will not listen even to the congregation, then treat him as you would a pagan or a tax collector”.* It is chilling to think that all the cruelties and injustices of the Inquisition were founded upon one simple text.

While there are instances, even today, when the Church denies natural justice to those who seem to step out of line, at least they do not end up being tortured or put to death. I like to think that in the end wrongheaded doctrines will fail through their own increasingly obvious inconsistencies and irrelevances.

And I like the text from the Acts 5 v 38 in which Gamaliel advises the Jewish Council:

"Now, my advice to you is this: keep clear of these men; let them alone. For if what is being planned and done is of human origin, it will collapse; but if it is from God, you will never be able to stamp it out, and you risk finding yourselves at war with God."

I have little expectation that Christian fundamentalism will be overcome in the near future. In fact I am reminded of the limerick:

"God's Word was in the beginning.
Man spoiled the creation by sinning.
We know that the story
will end in God's Glory
But at present the other side's winning."

All this is to do with the first implied meaning of the title "Believing in Science". In the next part of this lecture I consider the other meaning. It is difficult to compare and contrast science and religion in general terms since both subjects are so vast and varied; it is better to consider how the relationship exists in the minds and experience of particular persons. There are those within the scientific establishment who are Christian believers of different kinds. It is surely of great interest and importance to us to know something about how scientists themselves believe both in their science and in God. To pursue this idea I have chosen three scientists, one from the renaissance period, one from the mid nineteenth century and one from the 20th century.

Galileo Galilei 1564-1642

Galileo was a native of Pisa and received his early education at the monastery of Vallombrosa and for a time he hoped to enter the monastic life, and so we can certainly say that he came from the heart of traditional Catholic orthodoxy. He studied medicine and mathematics and invented the hydrostatic balance and at early age and was appointed mathematical lecturer in Pisa in 1589. His success in new methods of discovery based on empirical observation instead of deduction from abstract principles earned him the hostility of the Church authorities in Pisa and so in 1591 he moved to Florence and then to Padua where he became the professor of mathematics in 1591, a post which he held for 18 years. Using his newly invented telescope he discovered the four satellites of the planet Jupiter and he revolutionized the study of astronomy and became famous throughout Europe. In 1610 he was appointed philosopher and mathematician extraordinary to the Duke of Tuscany and boldly asserted the Copernican theory that the earth is a satellite of the sun. This brought him into conflict with the Holy Office, which, at that time, maintained the Ptolomaic belief

that the earth was the centre of the universe. From then on he was in conflict with he Holy Office and in 1632 he was summoned to the Inquisition and forced to recant under the threat of torture, and was condemned to imprisonment. He was released after a few months and spent the rest of his life in Florence where he died in 1642. There can be no doubt that he deserved the title of the Father of Modern Science, and his approach his best expressed in his own words:

"And who can doubt that it will lead to the worst disorders when minds created free by God are compelled to submit slavishly to an outside will? When we are told to deny our senses and subject them to the whim of others? When people devoid of whatsoever competence are made judges over experts and are granted authority to treat them as they please? These are the novelties which are apt to bring about the ruin of commonwealths and the subversion of the state."

[On the margin of his own copy of Dialogue on the Great World Systems].
Quoted in J R Newman, The World of Mathematics (New York 1956)

Galileo lived in the late Renaissance period when the theocratic rule of the Catholic Church was just beginning to break down. It was the beginning of the process we call secularisation when the absolute authority of the Church was giving way to what we may call the scientific method of reasoning and discovery. It was, no doubt, painful to Galileo to submit himself to the authority of the Church, and it may have been difficult for the Church to impose its will on such a distinguished scholar.

Charles Darwin 1809-1882

The main facts of the life of Charles Darwin are well known. He was the son of a wealthy local doctor, but was unsettled in school and had no idea about a career. At his father's behest he started training as a doctor at Edinburgh, and then switched to read of the priesthood in Cambridge and then he gave that up and was taken on as a naturalist to travel around the world in the Beagle (1831-1836). It was this adventure that proved to be his real education and the foundation of his career as one of the greatest scientists of the 19th century. His most important publication was "The Origin of Species" in which he explained what was to become known as the theory of evolution. The book was hugely successful and controversial and its consequences were to occupy Darwin for the rest of his life.

Our concern is the question of the relationship of science and religion in his life. He was not a serious believer in Christianity although he did attend church occasionally with his wife who was a devout Evangelical. When asked, some years later, how he could reconcile his theory of evolution with belief in God he is reported as saying that he thought that evolution was God's way of

Creating the world. It has been suggested that he delayed the publication of "The Origin of Species" for some time because he did not wish to upset his wife, and that he only went ahead with the publication when he realised that his discovery was shared with another scientist Alfred Russell Wallace who was about to publish a paper on the subject. In fact Darwin himself agreed that Wallace had made the discovery at about the same time as himself, although Darwin's book was far more detailed and thorough that Wallace's paper.

Darwin was not present in June 1860 at the meeting of the British Association for the Advancement of Science in Oxford University when the Bishop of Oxford, Samuel Wilberforce, and others attacked his book in a long and acrimonious debate. It was clear that Bishop Wilberforce had not read the book and had very little scientific knowledge. He stooped to make snide and personal remarks to Thomas Huxley, Darwin's chief defender. The meeting showed open resistance to the church's authority over the question of human origins at an influential public forum. Science demanded the right to pursue investigations touching of the very roots of human nature. It is true to say that the church never recovered from its defeat in this debate.

Pierre Teilhard de Chardin 1881-1955

Almost 50 years ago "The Phenomenon of Man" by Pierre Teilhard de Chardin caused a sensation in both scientific and theological circles. Its insights and conclusions have become a part of the intellectual life of the world. What was so interesting at the time was that it was a Jesuit priest who wrote this remarkable book.

Teilhard was one of the eleven children of the family of a small landowner in Auvergne. He was sent to be a boarder at a Jesuit College at the age of ten and became interested in geology and mineralogy. He joined the Jesuit Order and was ordained a priest in Paris at the age of 31. During the First World War he was a stretcher-bearer at the western front and was

commended for his bravery. After the war he continued his scientific studies and in 1923 he went to China as a member of a palaeontological expedition. He stayed there, with brief visits to France until 1946, and on his return he was showered with honours for his scientific achievements – he had played a major part in the discovery of Peking Man. In 1951 he moved to New York where he spent the last four years of his life. Early in his career he was refused permission by the church to publish a scientific paper. The discipline of the Jesuit Order required Teilhard to get permission to publish scientific papers. In a letter written to his cousin during the war he mentions this:

"I have to tell you that my article was not passed for Etudes. I'm not really surprised. In addition to treating of matters that objectively are controversial, the general tone would have upset the quiet, cautious readers of the review (this was the censors' primary objection)."

(Page 155: The Making of a Mind: Letters from a Soldier-Priest 1914-1919. Collins1965.)
After his death his friends published "The Phenomenon of Man" and, in due course, his other works.

The main thesis of "The Phenomenon of Man" is that the human race is an evolutionary phenomenon. He explores this idea from the very beginnings of creation to the present time and he speculates about its future course. Teilhard introduces his readers to a number of specialized terms such as "cosmogenesis" – the development of a world in which man is central, and "noogenesis" – the growth and universal interaction of human intelligence and consciousness. The most primitive forms of life eventually encompassed the whole surface of the earth, and then developed in complexity, forming what Teilhard called the "biosphere".

The rise of human consciousness also encompassed the whole surface of the earth and develops into what he called the "noosphere". He argues that these and other processes are at work in evolution, and are still evident in the stage of evolution now reached by the human race in its onward march. He distinguishes between the exterior and interior aspects of evolution and avers that in the development of the human mind the interior element is the most significant factor in the present stage of human evolution.

He describes the whole evolutionary process as the "cone of space-time", at whose base lay multiplicity and chaos and whose apex is the point of ultimate convergence in a complex unity that he calls "Omega". For Teilhard the Omega point toward which evolution is ever tending is God, who by His attractive force gives direction to and provides a goal of progressive evolutionary syntheses towards Himself. This seems to presage the current advocacy of Intelligent Design in large parts of the church in the USA

"Things have their within; their reserve, one might say; and this appears in definite qualitative or quantitative connections with the developments that science recognizes in the cosmic energy."

When I first read this in chapter 2 of "The Phenomenon of Man" called "The Within of Things" I confess that I had some difficulty in understanding how inanimate objects could have an interior aspect. Many years later I was watching a television programme in which David Attenborough broke open a piece of limestone with hammer and chisel and there inside was revealed the perfect fossil of a crustacean. It dawned on me then that the interior aspect of an inanimate object is the chemical and physical composition carrying the story of the formation of the object sometimes over a huge period of geological time. Carrying that principle forward to the interior aspect of human life and the emergence of consciousness we see that awareness of the historical process by which they came into existence is a major aspect of the interior life.

In attempting to understand Teilhard's thought I asked myself how he came by this important insight on the interior aspect of inanimate objects and living things. Although he regarded it as a scientific conclusion the fact that Teilhard was a Jesuit priest inevitably had great influence on this thought. He had a long training in Catholic theology and philosophy and would have been acquainted with Aristotelian metaphysics. Basic to that system of thought is the idea that all objects have an interior aspect called the substance, as contrasted with the

exterior properties, called the accidents. For example the doctrine of transubstantiation holds that in the Holy Eucharist the substance of bread and wine is transformed into the body and blood of Christ. So the "within" of the bread and wine has a supernatural connection with an historical event – the death of Christ. There is therefore a correspondence between Teilhard's scientific and theological understanding of the within of things.

Although "The Phenomenon of Man" was first published in 1955 (the first English impression in 1959) it should be noted that the original text was completed in 1939. Bearing this is mind it is astonishing to think of the nature of Teilhard's thought on the emergence of the noosphere. When the text was being written communications and the sharing of knowledge around the world was at a snail's pace compared with the present time. Letters across the globe could take weeks to arrive, telephone calls were difficult and expensive, television was in its early stages of development, and international travel was the preserve of the wealthy elite.

Yet, Teilhard had this vision of a world completely connected, an increasingly shared consciousness based on superb communication. As we consider the present situation with such things as emails, the world-wide-web, mobile phones, text messaging, and interactive television we may well conclude that the noosphere, as envisaged by Teilhard, is now reaching its maturity. The increasing interest in history as shown in television programmes is an example of the within of things focusing on the past as part of its self-consciousness.

If this is a reasonable account of the present state of the human race can we also accept Teilhard's vision of the Omega point? Before we attempt an answer to that question it may help to consider another question: From where did Teilhard get this idea? Just as in our approach to his thought on the within of things we considered his Jesuit background so in his idea of Omega we should look at his academic background.

Teilhard was certainly influenced by the modernism of his time. He is of the same generation as the French modernists – for example Alfred Loisy (1857-1940). Modernism was a movement within the Roman Catholic Church aimed at bringing its traditional doctrines into closer relation with the modern outlook in science, philosophy and the social sciences. It was at its most vigorous in France in the later years of the 19th century and was formally condemned by Pope Pius X in 1907. This however was but a local expression of the much wider movement in human thought. Modernism in the general sense is the process by which classical ideas of the nature of the cosmos, society and art and so on were gradually rejected and replaced by new ideas. For example the ideologies of capitalism and communism eventually replaced the ideology of feudalism. A feature of modernism is that it replaces the thought forms of a previous age and replaces with new thought forms and structures. Teilhard's idea of the Omega point seems to me to be an example of the way the modernist would see the logical result of the trends he describes in evolution.

In this brief glimpse into the thought of Teilhard I have made some comments from our own situation. This leads me to ask some general questions:

"Is it possible for a convinced and committed religious person to be fully objective in scientific research?"

While it is essential that scientific research is based on rigorous handling of the factual results of experiments and observations there comes a moment when the scientist has to suggest a hypothesis to explain and carry forward his conclusions. At this point what is involved is creative imagination and it may be that a religious outlook will influence the hypothesis. That, of course, does not make it right or wrong, only further experimentation and testing of the hypothesis will do that. Theoretically then a religious scientist can be just as effective as a non-believer. This is manifestly the case in Teilhard's scientific writing. In his introduction to the English edition of "The Phenomenon of Man" Sir Julian Huxley is full of praise for Teilhard's scientific thought although he does not share his theological conclusions:

"Though many scientists may, as I do, find it impossible to follow him all the way in his gallant attempt to reconcile the supernatural elements in Christianity with the facts and implications of evolution, this in no way detracts from the positive value of his naturalistic general approach" (page 19).

"In our post-modern world how far can we share Teilhard's idea of the Omega point?"

Here again Sir Julian Huxley has an important comment:

"Pere Teilhard, extrapolating from the past to the future, envisages the process of human convergence as tending to a final state, which he calls 'point Omega'. Presumably, in designating this state as Omega, he believed that it was a truly final condition. It might have been better to think of it merely as a novel state or mode of organization, beyond which the human imagination cannot at present pierce" (page 18)."

I doubt that Teilhard would think that Huxley has done justice to the concept of Omega in this remark. I think that from of post-modern perspective we would not go along with the concept either, since it seems to represent the kind of integrated thought associated with modernism.

"What does the world today make of Teilhard's identification of the Omega point with God?"

Of course the traditional Christian believer has no difficulty with the Omega point. It simply confirms his or her belief in the objective reality of God. Those who inhabit the secularized world would share the point of view of Sir Julian Huxley. They would see it as an example of the scientist moving on from a scientific to a religious understanding that they cannot follow. To such a person the Omega point has the same status – it is a wonderful idea, an unproved and unproveable hypothesis about the future of the human race.

While we would agree, indeed we must insist, that religion and science are two separate things, each with its own autonomy and purpose, nevertheless we see from these examples that it is not so easy to keep them separate in human experience. Certainly if we consider the lives of great scientists we see that this is so. In the case of Galileo while he fiercely argued for his science he meekly accepted the discipline of the Church and struggled with the challenge of obedience to the end of his life. In the case of Charles Darwin we see a much freer spirit although the religious establishment disagreed with him and opposed his ideas on evolution, he could not have been disciplined or made to recant by the Church, which had, by the middle of the 19th century lost its power to do such things. Darwin, however, expressed a sort of cautious acceptance of the existence of God, maybe for the sake of his wife, who was a devout Evangelical.

Teilhard de Chardin is a very interesting case of a brilliant scientist whose mind was constantly affected by his underlying religious beliefs, and in the end proved incapable of holding the two apart.