

# "SCIENCE AND THE CHURCH"

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## "SCIENCE AND THE CHURCH"

I have been led to discuss the connection between science and religion because of the constant discovery during my twenty years as a teacher and a scientist of evidence that some people feel that there has been, and even still is, a conflict between the Church, in particular the Catholic Church, and Science. The one form of evidence is the repeated discovery in books, particularly science text books, of false and unnecessary statements about the Church's attitude to scientific advancement.

### **Church Fosters Science**

Personal experience has shown me no evidence of such an attitude in the Church's policy or in Church history, and when I started to look deeper into this matter in preparation for this paper, I discovered such overwhelming evidence of the Church's fostering and encouragement of scientific advances, that I was tempted to change to some other topic which might have some real foundation for discussion. However, two events in Canberra in May, 1964, strengthened my resolve to air this matter, as apparently there is still some misunderstanding. The first event was listening to the statement by Professor Oliphant at the opening address of the Science Teachers' Association Conference in Canberra, that religious instruction had no place in the schools, that such time would be spent better in the teaching of science. The second event was during a tour of the Canberra schools during the Australian Council of Education Conference when I found a mural in the new laboratories of a Church school, depicting Galileo being led off to prison at the bidding of some ecclesiastical prelates. For a modern mural, its message was remarkably clear, but what an unnecessary distortion of the truth.

### **Wrong Statements**

Most of the similar erroneous statements found in text books are in reference to Galileo. and even his purely scientific achievements are sometimes wrongly presented. For example. two physics texts for Leaving Certificate Physics, refer to experiments allegedly conducted by Galileo from the Leaning Tower of Pisa. I quote: "Galileo and an assistant dropped a cannon ball weighing over 100 lb. and a musket bullet

weighing about half a pound from the top and found that they reached the ground practically simultaneously." \* [Footnote "*Hydrostatics and Mechanics*". A. E. McKenzie. 1960. (Cambridge). Page 215.] This book has a very "useful" picture of the Leaning Tower of Pisa printed on the opposite page! The other text has a slightly different version: "Galileo persuaded a number of the great scholars of the day to come with him to the Leaning Tower of Pisa. Climbing to an upper gallery, he leaned over and released simultaneously two objects, one many times heavier than the other." \* [Footnote "*A General School Physics*". Smith & Smith. 1962 (Rigby Ltd.). Page 27.] This book even has an illustration showing the bodies being dropped from the tower.

There are two things wrong with these statements. Firstly, Galileo is being quoted as the first to challenge the Aristotelian view about falling objects. This is very unfair to *Simon Stevin*, who published the findings of an experiment he actually performed in 1586, three years before Galileo even came to Pisa. \* [Footnote "*An illustrated History of Science*". F. Shewood Taylor. 1956 (Heinemann). Page 20.] Secondly, there is no historical evidence that Galileo used the tower of Pisa - he does not mention it himself nor do any of his contemporaries record witnessing such a demonstration. \* [Footnote "*Foundations of Modern Physical Science*". Holton & Roller. 1959 (Addison Wesley), Page 24.]

### **Contradicted by Evidence.**

But a far worse example of a false and unnecessary statement is in a physics text-book of Lecture Notes from the Sydney University: "Aristotelian Philosophy alone was not the cause of the failure of scientific knowledge to advance during the early and middle Christian Ages. The Church was the authority which dictated what men should study, both natural and supernatural. Mysticism and superstition were revived and befogged man's mind. Freedom to observe and experiment was denied." \* [Footnote "*Lecture Notes on an Introductory Course in Modern Physics*" H. Messel. 1959. (Compress). Page 8 ] This is wrong. There is an overwhelming abundance of evidence to the contrary.

### **Early Greek Attitude**

Admittedly the early Greeks were opposed to experimentation - mechanical work of any kind was considered beneath the dignity of a free man - and Aristotle did not believe in our modern "Cause and Effect" but rather "Nature and effect"; for Aristotle, smoke went up because it is of the nature of smoke to go up. It is very easy to be wise after the event, particularly two thousand years after, but surely we should have admiration for the Greek attitude - they were interested in the universe as a whole, not just snippets of information from experiment on parts of it. The interest was in the substance not just accidental phenomena.

### **Science Founded by Church**

There is no evidence, however, that the Church hindered the progress of science during the early and middle ages. Indeed the foundations of modern science were laid by the medieval Church. However, during those times so unfairly referred to as the "Dark Ages" the main intellectual effort was on philosophical and theological problems, not solely on scientific problems such as our modern worry over the Space Race and Safe Contraceptives.

### **Scholastic Philosophers**

It was Scholastic Philosophy which led to the correlation of occurrences with their antecedents thus making later Scientific advances possible. It was St. Thomas Aquinas who emphasized that the province of reason was distinct from the province of faith; it was Aquinas who showed that Aristotelian Philosophy could be put to use in the western world. The Christian Scholars of the middle ages were not uninterested in scientific matters, but one could hardly expect Scholasticism to produce the twentieth century spate of scientific theories without a reservoir of observed facts on which to work. For example, would Niels Bohr have produced his electron orbit theory if he lived in the age before spectroscopists had amassed the wealth of data on spectral lines?

## Church Created Climate

The medieval church did not hinder the development of science, indeed, it created the climate of thought necessary for the later growth of science. Two pertinent quotations support this - one from the avowed materialist du Bois Raymond who said, "Modern Science owes its origin to Christianity." The other from the American physicist Millikan, who stated: "Modern Science in its origin and development has been largely dependent on the initiative taken by religious bodies". In considering the slowness of the Church to allow study of Greek Philosophy as it was brought to Christendom by the Arabs and Moors, with its confusion of Aristotelian and neo-Platonic ideas, it should be remembered that the only texts available for some centuries were the very unreliable Latin translations of an Arab translation of a Syriac translation of the original Greek, and that once a direct translation from Greek to Latin was available in 1220, and Aristotle's had been sorted out from the misinterpretations these works became extremely popular and finally the popes made the study of Aristotle's Physics and Metaphysics obligatory for all candidates for a degree.

## Abundant Evidence Exists

As to the statement, "Freedom to observe and experiment was denied", there is abundant evidence of scientists, under the guidance of the Church, observing and experimenting throughout the whole of the so-called "Dark Ages". To illustrate my point, I shall list the scientists from the seventh to the sixteenth centuries whose names have come down to us, confining myself for sake of brevity solely to those who were priests, and omitting those who made discoveries in the medical sciences.

## Early Priest-Scientists Within Church

*Eugenius*, the Archbishop of Toledo ( 647 A.D. ), is noted as an astronomer and mathematician. The English Benedictine Monk, *Venerable Bede* (A.D. 700) wrote a work on Natural History, including all the natural sciences. The priest *Scotus* (A.D. 877) suggested that Mars and Jupiter revolve around the sun, and went far towards proving it (and this 700 years before the Galileo dispute). *Gerbert D'Aurillac*, lecturer in Astronomy in the University of Paris and expert in his time (A.D. 1000) on light and sound, deserves special mention because he is better known in history as Pope Sylvester II. Just to show that the role of the **woman scientist** is of long standing, one should mention *St. Hildegarde*, who as a nun had compiled a list of every known drug, in the three categories, animal, vegetable and mineral in A.D. 1100. The formation of the rainbow, both primary and secondary, was explained by the Dominican priest *Thierry of Freeburg* in 1293. The Franciscan priest *Schwars*, if he did not invent gun-powder, at least constructed cannon which used it, about the year 1300. *Peter of Spain*, an expert on light and vision, who was the first oculist in history, and the first medical specialist on record, became Pope John XXI, and had a laboratory built in his palace to continue his experiments. The Franciscan priest *Roger Bacon*, an expert on refraction and reflection of light, in 1250 suggested the possibility of the telescope. This monk was in trouble with his superiors for some of his scientific activities in the monastery, not, it should be noted for his scientific opinions. Knowing that Bacon's experiments involved gunpowder, we may feel a little sympathy for his short-tempered superiors!

## Other World Authorities

The chief world authority in Physics, Chemistry, Astronomy, Mineralogy, and Zoology in the mid-thirteenth century was the Dominican priest *St. Albert the Great*. He was one of the first to tilt at Aristotelian authority, or as he said himself: "The aim of the natural sciences is not simply to accept the statement of others, but to investigate the causes at work in nature." *Nicholas Oresme*, *Bishop of Toulouse* in 1382, is famed for the arguments he produced to show that the earth, not the sun, moved. *Toscanelli's* famous 277 ft. high gnomon, or sundial, was built in the dome of the Florence Cathedral - hardly evidence for opposition between Church and Science. Another medieval scientist priest was *Canon Copernicus*, who proposed his heliocentric theory about 1500, without the slightest opposition from the Church. His theory, which reduced the number of circles needed to explain stellar movements from 80 to

34, was not well received by fellow scientists, and could not have been successful because of ignorance of elliptic orbits. Finally, towards the end of the sixteenth century we come to *Pope Gregory XIII*, to whom our present day calendar owes its origin, and two famous Jesuit Astronomers, *Clavius* and *Scheiner* - the latter being an expert on sun spots.

## Technologists

Thus far, scientists. As for technologists, I can best quote from *Dr. A. C. Crombie*, Cambridge and London lecturer in the History and Philosophy of Science, who says: "In the field of Technology, the Middle Ages saw the most rapid advance since prehistoric times." \* [Footnote "*Augustine to Galileo*". A. Crombie. 1962 (London).]

Three points arise from this list of medieval scientists.

*1. The absence of outstanding contributions in the first ten centuries.* This was due mainly to the unsettled nature of this time for Christian Europe, with the Roman persecutions up until the fourth century being followed by the Barbaric, Moslem and Norse invasions, so that the unsettled society did not have a chance to undertake serious intellectual activities till about the eleventh century. According to the historian Hughes: "By the end of the ninth century Western Europe presented a scene of indescribable chaos, an immense waste with only a few islets of security and ordered life scattered about it here and there." \* [Footnote "*A Popular History of the Catholic Church*". P. Hughes. 1958 (Burns & Oates). ]

*2. The contribution to the growth of culture and learning by the monastic orders,* initially by the great Benedictine monasteries which maintained a tradition of literacy, and then later by the Dominican and Franciscan Friars. Oxford University owes its early successes to the Franciscan scholars, while the Paris University became the domain of the Dominicans.

*3. The relatively large number of contributions to scientific knowledge in those early centuries.* It has been estimated that 80 per cent of the world's scientists are alive today, and therefore in spreading the deceased 20 per cent over the last twenty centuries one would not expect in the early stage many names to appear, particularly in view of the "exponential" shape of the knowledge curve.

*Finally,* may I present one further piece of evidence to show that Christianity engendered scientific advancement rather than suppressing it. This can be seen in the failure of two great non-Christian eastern cultures, in China and India, to produce any worthwhile scientific discoveries in the same era.

## Concerning Galileo

In listing the scientific contribution of Churchmen, I reached the seventeenth century. Here I would like to digress for a moment and discuss another Catholic Scientist, Galileo, because, as I mentioned earlier, most misunderstanding seems to occur with reference to this great man. There is at present a great deal written about this famous case for those who are sincerely interested in the truth, so I would like to make just four points.

First: Galileo picked a very inopportune time to attack the Bible. Second, he was publicly disrespectful and disobedient. Third, he was wrong in his interpretation of the Bible. Fourth, he was wrong in his Physics.

*1. The inopportune time.* While not condoning in any way the action of some of the Cardinals at this time, one can hardly blame the Church authorities for taking a dim view of an attack on the veracity of the Bible, at a time when the Church was being rent by major heresies as in England, Germany and Switzerland.

*2. His public disobedience.* Just as today scientific contributions to reputable journals are passed to a panel of referees for censoring before being published, and just as any book on religious matters published

these days by a Catholic author is submitted to his Bishop for an Imprimatur, so did Galileo obtain permission to publish his works, as can be seen on the frontispiece of most of his books. For his *"Dialogue on Two World Systems"*, published in 1632, after the first clash in 1616, Galileo had permission to publish on two conditions: (a) that the Copernican theory be presented as theory and not as fact; and (b) that the papal arguments be included in the book. He failed to comply with the first condition, and offended the authorities by placing the papal arguments in the mouth of Simplicio, the rather slow-witted member of the three characters in the book. It was for these reasons that he was asked to appear before the Inquisition and made to recant his statement that the sun was known to be stationary, and made to do penance for his rudeness, both of which he carried out. His so-called imprisonment was merely a curtailment of his movements about Italy. He was in receipt of a papal pension from this time, he carried out experimental work at his residence - discovering the small oscillations in the moon's movements - and drew up a navigation system based upon the satellites of Jupiter. On his deathbed he was sent a papal blessing, a rather rare and highly prized privilege for any Catholic.

3. *His wrong interpretation of the Bible.* In the fourth century, St. Augustine had counselled his fellow Christians to read the scriptures to find spiritual truths - not matters of natural science. Galileo should have heeded this advice of thirteen centuries before, instead of asserting that the Bible was in error - in particular Joshua 10.13 "Sun and Moon stood still". We will agree with Galileo's own statement, "Holy writ is intended to teach men how to go to heaven, not how the heavens go" just as we would agree also with Cardinal Bellarmine's reply, "If there is contradiction between the Bible and observed facts, let us say we have misunderstood the Bible rather than pronounce false what is demonstrated". It was this over-literal interpretation of the language of the Bible that caused Galileo's trouble.

4. *He was wrong in his Physics.* The Copernican theory needed the velocity of light, first measured in 1675, and Newton's Law of Gravitation, formulated in 1700, for its proof, and obviously these were not available to Galileo in 1616. His proof from the tides was completely wrong. Most scientists of his day disagreed with his theory - two famous cases being Tycho Brahe and Francis Bacon. This alone would vindicate the action of the Cardinals who also condemned it; - (and, if it may help the present Ecumenical movement, let it be noted that Calvin and Luther both condemned it violently). As Huxley pointed out, "the Pope and the Cardinals had the better of it." In America both Yale and Harvard taught the Geocentric theory plus the Heliocentric theory until the eighteenth century. According to Professor Bok, the first real proof of the Copernican theory came with the discovery of the aberration of starlight in 1725, a century after Galileo's time.

### **Plea for Fairness**

May I make a plea for fairness. If it is necessary in a text book of Physics to mention the rise of opposition to the authority of Aristotle, why not quote St. Albert, 1250 A.D., instead of Galileo, 1616 A.D. If it is necessary to include a history of the experimental approach to falling objects, why not give Stevinus (Simon Steven) his due, and if it is necessary to discuss the opposition Galileo received in asserting without proof that a theory was a fact, surely opposition of scientists is of more interest than opposition of Churchmen, be they Luther, Calvin or Cardinals. A bad case of this unfairness, occurred last year in a Sydney Summer School where Professor Yeas said "Giodarno Bruno, as most of you know, also believed that stars are suns like our own, circled by planets inhabited by intelligent beings. Instead of receiving applause and an honorarium for this, he was burned at the stake in 1600". \* [Footnote *"Light and Life in the Universe"*. Butler & Messel. 1964 (Shakespeare Head Press), p. 217, p. 201.] This is wrong. Bruno was a blatant heretic who went around preaching publicly doctrines of false religion which would offend even Christians of today.

### **Not Scientific Beliefs**

Whether the burning of heretics was as enlightened a practice as the electrocution of criminals is a moot point, but as the reasons for the condemnation of Bruno have never been published, I would suggest it was his heresy, particularly his Pantheism, which was responsible, not his scientific beliefs. To say that the Church is opposed to science because of the "imprisonment" of Galileo or the execution of Bruno, is the

same as saying that the French Revolution was opposed to science because it executed the chemist Lavoisier, or that the American government is opposed to science because it imprisoned nuclear-physicist Fuchs.

## **Keep to Science**

The point I am attempting to make is that there is no place for unnecessary history, particularly false and biased Pseudo-History, in a text book of Science written by a scientist. Surely a scientist should not allow personal prejudices to colour a statement of experimental fact or a description of physical laws. In contrast, in the most recent science history book, *"A History of Science and Technology"*, by Forbes and Diksterhuis, the authors specifically refuse to include the History of the Catholic Church as an interesting digression from the historical development of the scientific concepts they are discussing.

In an entirely different category from a text book is a discussion of the role of the Church in the development of Science, such as this paper, or such as Professor Bok's address on *"Galileo and the Scientific Revolution,"* delivered last year at a St. Mark's Lunch Hour Lecture in Canberra. These are not expected to be a description of Physical phenomena in narrative prose as one would expect to find in a Text Book of Physics.

## **Book on "Galileo"**

I would like to quote a few passages from Professor Bok's address on Galileo:

"He was a proud and arrogant aristocrat" . . . "a rather unpleasant character, unnecessarily rude, and bent first on his own aggrandizement" . . . "His trial did not affect the forward march of science on a world-wide basis". And it is here that I would like to disagree with the opinion of my friend Professor Bok, as he goes on to say, "the trial . . . did much harm to the future development of science in Italy and it can be looked upon as one of the factors which led to the gradual shifting of the centres of learning from Italy and Spain towards countries like England, France and other West European nations where thought could be [more freely ] freer expressed than under the domination of the Roman Catholic Church." Neither is Professor Bok nor am I a historian, nor is the above a statement of scientific principle, nor is it, in my own opinion, a statement of observed fact.

There had always been centres of learning outside Italy, such as the Catholic universities of Paris and Oxford; similarly a great proportion of the great scientists up to the 20th Century were outstanding Catholic laymen such as Pasteur, Ampere, Fizeau, Foucault, Fresnel, Schwann, Smelweiss, Coulomb, Lavoisier and Fraunhofer. Italy was not in any way inferior to the other nations, for it produced such great names as Torricelli, Volta, Galvani, Fognano, Malphigi (the anatomist), and Morgagni (the pathologist) during the same period. Even in such modern developments as Radio and Atom bombs, the names of Marconi and Fermi rank rather highly. And finally, to demonstrate that scientific thought could be expressed freely well within the Catholic Church, I would like to list the following famous scientists of the last three centuries who were priests:

## **Priest-Scientists**

The hydraulic engineer Castelli was abbot of a Benedictine Monastery; the vulcanologist Kirchev was a Jesuit priest; Boyle's law was discovered independently by Prior Mariotti; camellias are named after the Jesuit lay brother botanist George Camel; lightning conductors were invented by an Austrian priest Father Divetch a year before Franklin reported them in America; the famous embryologist Fortunatus of Spain was Superior General of his order; the geophysicist Boscovich and the astronomer Secchi were both Jesuit priests; the discoverer of star Ceres was the astronomer Father Piazzi; two outstanding French priests were the entomologist Abbe Latrielle and the crystallographer Abbe Hauy; while two very well-known scientists were Abbots of their monasteries, Abbot Mendel (heredity and genetics) and Abbot Mersenne (laws of sound). The list is not complete, but it serves to show that the Catholic Church has made a significant contribution to the advancement of science in these centuries. Catholics are free and always

have been free to express their thoughts on scientific matters.

## **Religious Outlook of Scientists**

In looking through history books to collect this material, I was struck by the outstanding religious outlook of all great scientists, particularly some of the non-Roman Catholics, men such as Newton, Kepler, Faraday, Joule, and even the evolutionists Lamark and Darwin. To quote just one of these, Lord Kelvin: "Science positively affirms the creative power, and makes every man feel a miracle in himself."

Perhaps the pattern has changed in this materialistic age. C. P. Snow in his *"Two Cultures"* claimed that more scientists are, in religious terms, unbelievers. This has not been my experience in mixing with scientists, particularly Physicists, throughout Australia. It is a very hard thing to assess, particularly when one's contact is on the professional scientific plane only. Scientific research does not lead away from God; as J. A. Thompson put it, "Nor can it be said that science engenders an irreverent spirit"; but neither does it necessarily lead to thoughts of God, particularly if one sets a strict frame of reference within which to work. Instead, this is one of the most satisfying aspects of scientific work - one can select a region of interest which can be made completely self contained, and then work in that field to produce results that are perfectly satisfactory within that field. But this very narrowness illustrates clearly the distinction between observed scientific phenomena and the philosophy underlying their understanding. Science is only one facet of knowledge - science is only one of the ways of attaining knowledge and many of the most important realities of this life are beyond its reach. Scientists can quite easily overlook these more important realities, and the advice of Heisenberg is worth noting: "Revere those things beyond science which really matter and about which it is so difficult to speak."

## **Christian Theistic Philosophy**

The philosophy of interpretation which I have accepted, and which I assume most of my readers accept, is a Christian Theistic Philosophy. I believe in a Personal, All-powerful God. I believe that all things were created by God for a particular purpose and that all things have God for their first principle and final end. After their creation the physical entities which we use in science continue to interact without any necessary direct intervention on God's part, and from a study of these entities and their interactions, we are led to understand more and more of God's handiwork. As the Protestant Kepler put it so aptly: "Science consists of rethinking the thoughts of God."

## **True Meaning of Education**

I found this same philosophy underlying the work of my senior science colleagues, but not in the case of the majority of the younger generation who seemed to have no underlying philosophy of life at all. On considering this phenomenon for some time, again in contradiction of C. P. Snow, who in England found more religious belief in the younger generation scientist, I can see only one factor which might explain it and that is the type of school or type of education these scientists had enjoyed. More and more people now are entering universities after having their secondary education at Government schools where the education is free and secular. A true education cannot be secular. Education in mathematics can be secular, education in Physics can be secular, education in English can be secular, but education itself in the true meaning of the term cannot be so.

A child is not just an animal - it is a human being with a body and a rational spiritual soul, and the development of that soul is just as important, even more important, than the development of intellect or bodily skills. And that is why the Catholic Church feels that an education without integral religious instruction is as lopsided as an education without cultural or scientific subjects.

## **An Absolute Moral Standard**

When people refer to scientists as being religious they sometimes refer to the evidence of a social conscience in the attitude of the scientist to the implications of his work. An example of this is given in

concern expressed by the first nuclear scientists as to the use of fission as a destructive weapon of war - as pointed out in Jungk's book, *"Brighter than a thousand Suns"*. This is not morality, but an extension of the philanthropic "Do unto others or else" attitude. There is an absolute moral standard; right and wrong do not depend upon the effects of one's action upon one's neighbours. but upon the effects of that action upon oneself and one's relation to God.

This is why I was so disappointed by the statement of the *"Aims of Australian Education"* recently published by the Australian Teachers' Federation, which although it stated that "education should provide opportunities for the maximum development of moral and spiritual qualities" went on to give the special contribution of State education systems in this matter to be the formation of a "love of truth and the scale of sound moral values, as an ethical guide to a pattern of behaviour which would respect basic human rights". In other words, a social, but Godless, education. As a scientist and a science teacher, I find this insufficient, for it can produce only materialists. A cynic has been defined as "one who knows the price of everything but the value of nothing". Similarly a materialist can be defined as one who knows how things work, but not why they work. I doubt if a materialist can be a really great scientist, and I give as an example of an atheistic education producing bad science, the public blasphemy of a Russian Cosmonaut who apparently has never been taught the difference between material and other realities, for he is quoted as saying that in 17 orbits about the earth he failed to find any trace of God. The American astronaut's reply is fitting: "If he really wanted to meet God all he had to do was step outside his spaceship." In similar vein was the famous surgeon's disbelief in the existence of the human soul because in many operations on the human body he had never seen it! And this negation of the human soul leads me to one last topic for discussion of the Church's attitude to Science, and that is the **theory** of Evolution.

### **Theory of Evolution**

The evolution theory is not new - it was proposed by the Greek Anaximander in 600 B.C. He suggested that living things originated in slime, and that man was born inside a fish. After its revival following the work of Darwin and Abbot Mendel, the theory met with opposition from both scientists and Churchmen during the "missing link" era, due mainly to the dishonesty of men such as Haeckel who used the same plate to print the embryos of a man, an ape, and a dog, and invited his readers to note the wonderful resemblances; or of Professor Smith of London, who had a two-page picture reproduced in a newspaper article showing the ape man, Hesperopithicus, and his wife, the whole being based on Osborne's discovery of a tooth in Nebraska - a tooth later declared to belong to a wild pig. The Piltdown man hoax did nothing to enhance the extreme evolutionary theory in the eyes of the non-expert. Similarly attacks on the Biblical Genesis version of Creation by extremists produced the same hostility in Church authorities as did Galileo's attack on Joshua's stationary sun.

### **Modern Evidence**

However, in light of modern evidence, the **theory** of evolution has settled down (1964) and is accepted by many scientists, but in this field there is much misunderstanding of the Catholic Church's attitude to this scientific theory. An example of this occurred at my own school, Aquinas College, where a non-Catholic Biology teacher told his class that the "next lesson would be on evolution" and that "any student who found this offensive, opposed as it was to Catholic belief", could absent himself from the lesson. This, of course, is incorrect.

### **Church Teaching**

The **only teaching** of the Catholic Church concerning evolution is with regard to the human soul. The Church teaches that God creates directly and immediately the soul of each human being. There is nothing in the theory of evolution **intrinsically** repugnant either to Scripture or to Faith. Catholic scientists obviously may, and do, work towards the establishment of this or any other scientific theory. It was quite pleasurable for me as a scientist who does not believe that man is just an animal, to hear *Professor Eccles, a world authority on brain functioning, in his address to the Science Teachers' Conference in Canberra, state that he could not see how the brain of man could have developed gradually from the brain of any*

*animal - the differences in function being so great.*

## **Origin of Life**

The origin of life on this planet is one facet of the evolutionary theory - it has progressed greatly from the 1886 "beetle from outer space" theory for origin of earth life, and the "protein rich soupy ocean" now so popular does not seem to differ greatly from the slime theory of Anaximander 26 centuries ago.

A modern discussion on evolution would be somewhat lacking without mention of the Jesuit priest Teilhard de Chardin, whose work, the *"Phenomenon of Man"* has received recently such controversial publicity. An Archaeologist of note, Father de Chardin was a mystic as well as a scientist. The fact that this unique contribution to evolutionary theory comes from a Jesuit Priest illustrates my point that the Church fosters scientific development, and the fact that Father de Chardin was forbidden by his superiors to publish most of his non-archaeological works - far from being grist to the anti-clerical mill, is rather an example of the Church's care for correctness in spiritual matters. De Chardin's views on the human soul did not seem to be in accord with official Church teaching, and as the nature of the soul is spiritual and not in the realm of natural science, the Jesuit superiors rightly restricted de Chardin's writings in this non-scientific field. It is interesting to note that both de Chardin and Galileo, no matter how disappointed they were in the ban on their publications, accepted the authority of their Church in spiritual matters and complied. {Webmaster's assistant's note: This is, unfortunately not true of De Chardin's executors (even though De Chardin had taken vows of poverty and obedience). His writings need to be approached with the greatest of cautions.} May I stress also that the Church has not condemned these revolutionary evolutionary ideas in any way, even though young scholars have been advised to be careful in attempting to interpret them.

## **Conclusion**

I have tried to show in this paper that there are no real grounds for any conflict between religion and science, as the physicist Max Planck said: "Religion and science are not incompatible but they supplement and necessitate each other." I have tried to show that the Catholic Church has not been and is not in any way antagonistic to scientific advancement. To quote Pope Pius X: "Religion has no fear of Science. Christianity does not tumble before discussion but before ignorance". I have made a plea for a more scientific attitude by authors of science books, to prevent the continued propagation of fictitious "Church versus Science" struggles. May I emphasize again using the words of Lord Kelvin that "Science is not antagonistic to but a help for religion". I would like to make a plea to my fellow science teachers in the previously quoted words of Heisenberg: "Revere those things beyond science about which it is so difficult to speak". And in conclusion I put before you as the correct attitude for any enquiring mind the words Lord Tennyson wrote on beholding a small growing flower:

"Little flower, -  
but if I could understand  
/what you are, root and all, and all in all  
/I should know what God and man is."

\* \* \* \*

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