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Big Bang Theology:

The Reconciliation Of Science and Religion

By Milton L. Boyle, Jr.

A struggle began in 1633 which is not yet resolved. It is a contest for the highest possible stakes--the mind of man, and it pits two most formidable opponents against each other: science and religion. The event that initiated this battle was the trial of Galileo and the dominant issue was much more than a man's challenge of his church's teachings and authority. Rather it was science versus religion, a new manifestation of an age-old struggle between faith and reason, the way man comes to know reality.

Actually, Galileo's problems with religion were not new. Greek philosophy had considered it and Aristotle thought his concept of the "Unmoved Mover" had adequately answered the questions raised by the sciences concerning the origins and operation of the universe. In the thirteenth century, Thomas Aquinas believed that he had properly identified that Unmoved Mover with the Christian God and had thus forever reconciled the Christian faith and the sciences. Aquinas and his medieval compatriots had a very simple and reasonable schema of the universe: all objects were created with innate purpose and each object was related to all others in a divinely designed hierarchy. Man was at the apex of this hierarchy, the center of all creation, and he moved about on a planet that stood at the center of the universe; all other entities of the heavens spun around it. Man was thus the star of a great cosmic drama, one Ian Barbour in his *Issues in Science and Religion* describes as a five act play: Creation, Covenant, Christ, Church, and Consummation. Since the first century of the Christian era we have been performing in Act IV: Church. The Consummation is yet to come. The medieval view was, of course biblically centered. The Bible, as the inviolate word of God, revealed the truth and few disputed its cosmic view.

A century before Galileo, however, the foundations of the biblical schema had been shaken by the theory of Copernicus that the sun, not the earth, stood at the center of the solar system. His evidence was based largely on mathematical calculations and were not acceptable to most, but Galileo offered visual evidence, with the telescope, and many were persuaded. The Church could not allow the challenge to biblical authority to pass unheeded and called the noted scientist to answer charges of heresy.

To his later regret, Galileo recanted, but the gauntlet had been flung and the duel begun. It was not possible to long ignore the evidence that man and earth lie not at the center of the universe, but off to a somewhat obscure side. Man still reels from the shock of learning that he is not center-stage in the cosmic drama, but is, on the contrary, a mere spectator to that drama which unfolds before him.

The Church . . . called the noted scientist to answer charges of heresy.



Galileo

Isaac Newton did nothing to help him regain his composure, either, when he convincingly argued and demonstrated that the universe operates like a law-abiding machine, doing what it has to do, without the necessity of a sustaining (divine) power at the controls. Determinists saw the universe as a self-sufficient, impersonal machine and believed we would eventually predict every future event because it was already determined by natural law. Materialists denied the existence of God, soul, and spirit. Deists retained the idea of God as creator, but believed that God had started things in motion only to walk away from them, caring nothing about creation's destiny. With these and other atheistic and agnostic theories, religion had to contend, fighting for its very life.

Fate had worse in store--Charles Darwin. *The Origin of Species* burst upon the world in 1859 with its incredible theory of evolution based upon the cruel principle of the survival of the fittest. Darwin's thesis was reasonable and supported by a massive amount of evidence. The religious community quakes even now before it!

By the end of the nineteenth century, the biblical view of the universe had become untenable. Man is revealed to be a tiny bit of protoplasm on a miniscule ball of dirt in a rather dim section of a vastness impossible for the human mind to comprehend. The idea of a God who is all-good (survival of the fittest?), all-powerful (so much suffering?) and all-wise (such bad cosmic design!) is, in the minds of many no longer defensible. The world is a vicious place without rational design or purpose, man all alone in a hostile environment.

In the face of such evidence, religion, to survive, must divorce itself from science. The two views are incompatible and most scientists and theologians tacitly agree to keep to their respective areas of concern, theology to deal with the intangible matters of soul, spirit and divinity, science to deal with the physical aspects of the universe. Let neither interfere with the work of the other for they have nothing to say to each other. This is, I think, the prevailing opinion of most scientists and theologians at the present time.

While I have dealt primarily here with Christianity, it must not be supposed that the struggle described is limited to that

religion. Muslim fatalism is also incompatible with scientific knowledge. Those who believe that Allah has already written the Book of Life for every individual view science as intrusive, an attempt to subvert the Almighty Will and change the predestined course of history. (Had Allah wanted a dam across the Nile, he would have put one there.) Buddhist and Hindu aestheticism transcends the physical concerns of science and seeks ultimate bliss in meditation on nothingness. Taoists seek the slowly flowing way of life, to move with that stream which the sciences tend to buck. Even Orthodox Judaism has ever sought to retain the past in the present and has regarded scientific progress with suspicion, incompatible with Torah. It is, I think, very much to Christianity's credit that the battle has been waged at all, and that, indeed, it is only in a Christian milieu that science has arisen (see the excellent recent work by Eugene M. Klaaren, *Religious Origins of Modern Science*). It should be noted that Galileo, Newton and Darwin were devoted Christian believers until their deaths; Darwin once even expressed regret that his *Origin of Species* had ever been published.

In this context, there can be little doubt that science reigns as victor. It has very practical applications and our lives have been made immeasurably easier by its findings and inventions. Our increasing understanding of nature has given us astounding control over that nature, and we can be assured that time will only add to our ability to understand and control. We look forward to solving our energy problems, controlling our weather, and prolonging our life spans, perhaps to conquer "natural" death once and for all. That such discoveries will present us with gigantic social and personal problems and perhaps with insoluble dilemmas stops our investigations not at all. Let science seek the truth no matter the cost.

The predominance of science in our time worries some of us, nevertheless, for we fear the loss of our humanity. For a long time machines have done our physical labor, and now we rely increasingly upon them to do some of our mental work also. They do our calculating for us and some of our thinking. They are even beginning to do our talking. Our nuclear capabilities threaten to destroy us; our machines may eventually make us obsolete, or worse, slaves to our own discoveries and inventions.

In spite of the prodigious influence of the sciences, however, cries of protest continue to rise, cries that call for a better understanding of ourselves, our spiritual nature as well as our physical being. Some of



God Creating the Universe, by William Blake

these cries are, to some, rather pitiful and pathetic. Such is the nub of the controversy between so-called evolutionists and creationists. Laws have been passed in Alabama, Texas and elsewhere which demand equal time in our public schools for the teaching of the biblical story of creation and the scientific theory of evolution. So far the courts have not supported this legislation. I doubt they ever will. Of a similar nature is the continuing call for prayer in the public schools. That problem just will not go away.

If we are to save our humanity . . . we must find reconciliation between science and humanistic endeavors . . .

A more serious problem exists, I think, in some of our institutions of higher learning where free discussion of the problem is sometimes prohibited, and where scientists may be prevented from teaching and discussing the possible theological implications of their work. Such questions, they say, lie outside the scope of the sciences. A year ago a friend, an astrophysicist at one of our most prestigious universities, wrote me that he could not aspire to tenure if he should pursue his interest in the relationship of science and religion. He must not attempt to answer his

students' question, "But what does it mean?" He was criticized recently because an article on the origin of the cosmos was "too teleological." He writes me now that tenure was denied, he believes for these reasons, and he must seek to follow his interests elsewhere.

If we are to save our humanity, it seems to me, we must find reconciliation between science and humanistic endeavors, especially with regard to our search for meaning, more especially in our search for God--or the divine principle behind creation. I stress this because I believe that religion is--and always has been--the most important way in which we know and express ourselves as human. Religion has been the major impetus in our search for meaning and provides a most significant answer to that search. It has been the major factor in helping us to fulfill our promise, the realization of our abilities, capabilities and personalities. Religious man has made the highest achievements in the arts and in other expressions of beauty and in service to his fellow man. Religion has taught us to pursue our highest worthy goals to their completion in spite of the odds or the opposition. In religion, and only in religion can man find the means to be the best he can possibly be. Many, pointing to wars, oppression and other crimes committed in the name of religion, will challenge this statement, and space limitations prevent adequate defense here. A few comments may be helpful, however, although I should regret it very much if the main thrust of this paper should be lost in debate over this tangential point, which, while crucial to our survival, is not crucial to my argument.

Much, probably most, of the evil credited to religion is unfairly so attributed, but should more properly be laid to political, economic and social causes, as well as the selfish impulses of influential persons. I see, for instance, nothing in Christianity that justifies the Crusades, the Inquisition, nor any other oppression of the human spirit. It is, on the contrary, the religious spirit of men and women, like Martin Luther King, Mahatma Gandhi, Mother Teresa--to say nothing of Lao-tsu, the Buddha, Moses, Muhammed, Jesus--who have truly advanced the cause of humanity. I maintain that it is the loss of that spirit which allows us to stagnate, bound to ideas--religious and otherwise--that keep us in the archaic past and prevent our constructive confrontation with the present. I point, too, of course, to the superb artistic evidence of Michelangelo's Sistine Chapel, Handel's *Messiah*, Schubert's *Ave Maria*, and Goethe's and Gounod's *Faust*, naming only a few of countless such. Further, I would



point to the nameless billions who have found meaning in life and the strength to live it and conquer it through their religious faith. It has always been, and will always be, the religious answer to the question of life's meaning that fulfills us and inspires us to our greatest achievements. Philosophical and scientific answers provide no such inspiration. Why else should every major scientific advance from Galileo to the present be followed by prodigious religious reactions and awakenings? Even our own sophisticated civilization witnesses a world-

wide burgeoning of religious conservatism in the wake of the splitting of atoms, Sputnik, and the shattering of the shackles of earth's gravity. Man cannot live by reason alone!

We can then, no longer afford the luxury of relegating science and religion to separate realms of concern; their concerns must be the same--the betterment of mankind. Religion must deal with the physical world to give it meaning and science must deal with the world of spiritual things to give it rationality. Science and religion have things to say to each other and the dialogue must begin now. Strangely, perhaps, I think it is the scientist who must take the initiative and lead the way, because it is he, not the theologian, who has the wider view, and because, I believe, his research leads him ultimately to the threshold of the question of divine principle in nature. He cannot, in conscience as a human being, fail to ask, with his students, "But what does it mean?"

Ultimately the problem resolves itself into the question of how the two disciplines seek answers and the evidence they consider appropriate to their search. We might summarize these different approaches as follows:

The Scientist:

1. Is objective: removes self from the inquiry
2. Is rational: solves problems intellectually, with reason and logic
3. Predicts the future with a high degree of certainty
4. Tests hypotheses empirically; discards those negated by evidence
5. Deals with physical reality verified by observation; eschews faith.

* * *

The Religionist:

1. Is subjective: commits self totally to the inquiry
2. Is non-rational: transcends or ignores reason in problem solving
3. Predicts the future with low degree of certainty ("God works in mysterious ways.")
4. Works with untestable hypotheses; ignores negative evidence.
5. Deals with non-physical reality not verifiable by observation; accepts by faith.

This summation is something of a caricature since there is a wide variety of scientists and religionists and not all adhere strictly to the written and unwritten rules of conduct for their respective professions, but it can serve as a central point for discussion.

Even our own sophisticated civilization witnesses a world-wide burgeoning of religious conservatism . . .

Philosophy of Science, a relatively new academic pursuit, has shown that the ideals of the scientist are difficult, maybe impossible to attain. Pure objectivity in research may be desirable but it is unattainable. All data is interpreted; data selection and rejection are personal choices; conclusions are influenced by opinions; and all human beings are myopic to some degree. Scientists, like the rest of us, often look at the same data and draw different conclusions, something pure objectivity should prevent.

It has been the advent of the so-called "New Physics," however, that has really challenged the scientist and has caused some to question the very basis upon which their discipline is set. It begins, surely, with the brilliant theories of Albert Einstein, first the Special Theory of Relativity and later, the General Theory of Relativity, but it took nearly fifty years for the importance of his theories to be realized by the scientific community. Their implications are hardly known yet. A major impact upon the foundations of science was made by the development of quantum theory by Planck, Bohr, and others, and by the Heisenberg Uncertainty Principle. Simply put, these theories state that energy comes in discrete packages which appear sometimes to act like particles and at other times to act like waves (non-particles), and some phenomena appear to act both as particles and non-particles. The action of individual entities of this kind is unpredictable. Only when large numbers are present can we predict their actions with any certainty and then only because we average-out the probabilities of their behavior. Further, the more accurately we measure one quality of these tiny entities, velocity, for example, the less accurately we can know another quality, its position, for example. Thus it is known that some entities act both as particle and non-particle, i.e., matter and non-matter, and that perfect prediction of their behavior is impossible. Physics takes on an aspect of the non-rational, and in fact

the scientist learns that the structure of the atom is beyond the conceptual abilities of his mind. He loses "picturability" and has often to deal in models, symbols and paradigms. Thus he loses the ability to know reality.

With the invention and development of space technology and the computer, the amazing ramifications of the Einsteinian theories of relativity are just now becoming known. Their application and meaning center chiefly in the physicists' search for the origins of the universe and lend support for the so-called "Big Bang" theory of creation. That theory proposes a large and extremely dense ball of primordial substance which, at the beginning of creation heats to an incredible degree and explodes to cast its matter into space where some of it coagulates eventually into stars, planets and the other components of the universe. The Big Bang theory is supported by evidence showing that the universe is expanding; all things are moving away from each other. Further, the "sound" of the big bang reverberates yet throughout the universe and can be detected by radar telescopes. The nature of the universe was determined, according to Nobel Prize winner, Steven Weinberg, during the first three minutes of creation. Only one of many possibilities is realized, but, fortunately, the result is the ultimate evolution of man, a creature who can think. Eric Chaisson in *Cosmic Dawn* notes that now the universe has evolved to the point where it can contemplate its own origins.

There are some amazing phenomena in this universe of ours. Numbers are so large the mind cannot hold them. Stars exist 10,000,000,000 light years away from each other and light travels at the rate of 186,000 miles per second. Most of the stars we see are part of one galaxy, the Milky Way, but in space there are millions of galaxies, as large or larger than our own. On the other hand, the realm of the atom entities are so infinitesimal that the mind, likewise, cannot hold them. Some particles are so tiny they pass through the entire mass of the earth without striking any of the countless bits of matter that constitute that mass.

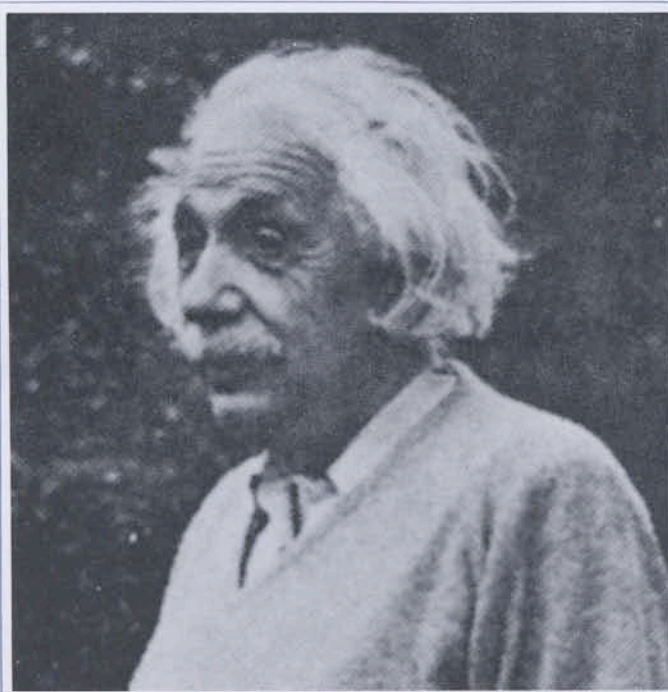
In order to investigate the secrets of this universe and its origins, the astrophysicists make some fundamental assumptions and currently believe that these assumptions are fully justified because nothing else makes sense to them:

1. The universe is homogeneous, i.e., it is the same no matter where one may stand within it.
2. The universe is expanding, but not with everything moving away from a common center (as one would expect from an explosion) but rather with everything moving away from everything else. Objects in space move away at different rates of speed, however, depending on how close they are to the observer. Those objects farthest away from you move faster than those nearest to you. Again this is true no matter where in the universe you stand. In other words, the rate of speed of an object depends upon where the observer happens to be.
3. Regardless of how fast an object moves, light from it travels at a constant speed, 186,000 miles per second. It takes light the same time to travel between two objects no matter whether they are stationary, or moving toward each other or away from each other however rapidly.
4. Space is expanding, but not into empty space because there is not even empty space beyond the limits of the universe. The space in which the universe exists is all there is. We can not even speak of nothingness beyond the universe.
5. Time is the fourth dimension, and time is dependent upon the position of an object, or person, and upon its rate of speed and upon its mass. In the presence of massive bodies time slows down; in the presence of a "black hole"

it stops altogether. Very rapidly moving bodies age more slowly than stationary ones. If you could travel through space at the speed of light you would live forever, could travel for 1,000,000 years in earth time and return to earth not one second older than you were when you left. If it were possible to travel faster than the speed of light, you would probably move backwards in time, perhaps to return before you were born!

Some other examples might be cited, but the point is made, I think. These basic assumptions, accepted by the world's most renowned astrophysicists are their statements of faith, and they are, I submit, as untestable and as non-rational as any statement of faith made by a religious person. The scientist hangs his very existence upon them, no less than a religionist. The model of the scientist now changes dramatically. My earlier summary of the scientist versus the religionist needs to be changed to the following:

1. Both the scientist and the religionist are subjective, the former only reluctantly so and thus to a lesser degree, but religious people can also be objective to some degree about their faith, e.g. in past times, Augustine, Anselm, and Aquinas; in the present, Bultmann, Barth, Tillich. I think the difference is not great.
2. Both disciplines deal extensively in the non-rational. The scientist's assumptions, as we have just shown, can be immense; religious faith can be (and I think it should be) reasonable.
3. Both work in a milieu of uncertainty. The scientist's batting average is surely higher than the Prophet's because they operate in different areas of research, but perfect predictability is impossible by the very nature of the universe.
4. Both make assumptions and develop hypotheses which are sometimes untestable. Religious people usually believe their faith is amply proven by their experiences.
5. Both are unable to know reality. Each discipline must deal with symbols, models and paradigms that represent or suggest the real. As the God of the Judeo-Christian tradition cannot be comprehended by the human mind, neither can the universe nor the atom.



Albert Einstein

Two other concerns strike me. First, philosophers have long considered the idea of the Unmoved Mover, the First Cause. David Hume leveled serious but purely theoretical criticism against it, and, some believe, Immanuel Kant destroyed it. But somehow their arguments fail to satisfy. We still ask, "Where did it all come from?" The question is welded to our quest for meaning. The "Big Bang" theory raises the question again. It states that suddenly the "stuff" of the universe is there; it explodes and we result. From whence came that "stuff?" What was there one billionth of a second before--or an eternity before? A theory of a continually expanding-contracting universe does not fit the evidence. Steven Weinberg in *The First Three Minutes* shows that the big-bang has occurred only once.

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Experience and faith both deny a spontaneous origin. It is far more reasonable, I submit, to ascribe creation to an eternal and superhuman power.

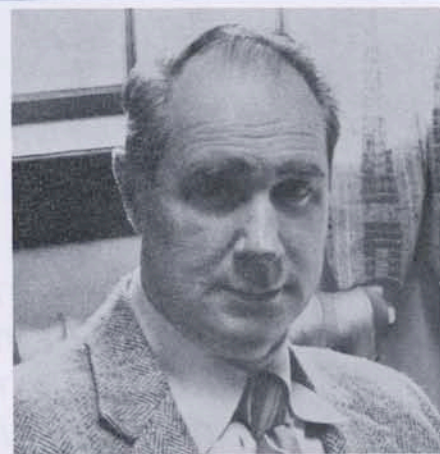
Secondly, philosophers have likewise considered the possibility of design in the universe. Hume, Kant and Darwin have presented strong evidence to the contrary. But, the "Big Bang" theory raises its questions once more. Professor Owen Gingerich of the Harvard-Smithsonian

More than one scientist has described the situation as a mountain which is being climbed on opposite sides by scientists and theologians.

Center for Astrophysics commented to me that it was a lucky break for man that the universe turned out as it did with carbon as the basic unit of organic matter. "What if it had turned out to be silicon, for example?" he wanted to know. In all likelihood we would not have been. Recently, Professor Frank Tipler of Purdue University has calculated that in the beginning there was one chance out of 1×10^{500} possible genetic variations that man could have evolved. Is it reasonable to insist that we arrived by chance (one out of 1×10^{500}) or that it was just a "lucky break" at the moment of the big bang?

Thus, I submit, the two titanic antagonists approach each other as they develop and become more aware of the nature of the universe of which both are a vital part. More than one scientist has described the situation as a mountain which is being climbed on opposite sides by scientists and theologians. They will eventually meet at the top, having arrived thus at the same point. Some deeply religious person will surely be there to ask, "Where have you been? I have been waiting for you."

The door is open for dialogue. Let it begin!



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Professor Boyle was Registrar and Assistant to the President of Curry College where he also taught religion and archaeology. He came to Bridgewater State College as Associate Professor of Humanities and Director of the Division of Humanities, later appointed Dean of the Division. His current research interests include studies in Semitic languages, biblical archaeology, history of the Baptists in America and as the present paper attests, the relationship of science and religion.